LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

Volume 30

2023

Bate Stamp Numbers
01189419 – 01191287

Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976–2023

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 30

2023

A.	Title:	(Cont'd) Report – Final Preliminary Assessment and Site Inspection of Per- and Polyfluoroalkyl Substances, Former Longhorn Army Ammunition Plant, Texas
	Author(s):	Arcadis U.S., Inc.
	Recipient:	USACE
	Date:	August 18, 2023
	Bate Stamp:	01189419–01190186
B.	Title:	Report – Draft Final Ninth Annual Remedial Action Operation Report, LHAAP-67 (Aboveground Storage Tank Farm), Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, September 2023
	Author(s):	Department of the Army
	Recipient:	Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	September 11, 2023
	Bate Stamp:	01190187–01190567
C.	Title:	(Cont'd) Report – Appendix C Level IV DoD to Draft Final Ninth Annual Remedial Action Operation Report, LHAAP-67 (Aboveground Storage Tank Farm), Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, September 2023
	Author(s):	Department of the Army
	Recipient:	Environmental Protection Agency and Texas Commission on Environmental Quality
	Date:	September 11, 2023
	Bate Stamp:	01190568–01191287

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment

Installation: **Longhorn Army Ammunition Plant** **State:** ***Texas***

Date:	9-Mar-21
Potential Area of Potential Interest (PAOPI) Name:	Vehicle Maintenance Area
Location Description:	North of LHAAP-004
Latitude/Longitude:	
Field Personnel:	Dana Schmidt, Mike Madl
Site Contact/Title:	Aaron Williams, Paul Bruckwicki
Weather:	70s, partly sunny

Sources

Recognized Primary Source (circle):

Fire, fire training, fire station, nozzle testing, crash site, chromium plating, hangar/aqueous film-forming foam suppression system, **auto maintenance,** photo processing, fuel spill, pesticide/insecticide use, **wash rack**, other:

When/Frequency:	Until installation closure
Product Released and Volume:	No foam releases recorded
Other Notes:	

Recognized Secondary Source(s) (circle):

Stormwater or sewer system components, wastewater treatment plants, landfills, remediated soil application sites, surface water flow pathway, potential for groundwater infiltration, other: **sumps, wash rack**

When:	Until installation closure
Migration Potential:	sumps and wash rack known to route to wastewater treatment. Sludge was known to have been taken to
Other Notes:	UEP-24

Physical Setting of Potential Area of Potential Interest

Topography and floor/ground surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Buildings are all demolished. Heavily vegetated. Between each buliding area are lower elevated marshy areas where stormwater would flow

Infrastructure (e.g., note entry to sewer system via drop inlets/storm drains/sanitary sewer/wastewater treatment plant, pavement, buildings):

no buildings, but sumps and wash rack exist

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment

Installation: LHAAP PAOPI: Vehicle Maintenance Area Date: 9-Mar-21

On- or off-installation monitoring or drinking water wells (number and proximity to potential area of potential interest, note access and condition of wells):
several monitoring wells nearby, seemingly in good condition. Primarily near sump 146
Surface water bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):
small creek to the west of the vehicle maintenance area
Surface drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):
stormwater flow seems to be to the west
Site status (current or past IRP and decision [e.g., no further action, monitored natural attenuation, system], previous remedial actions or other perfluorooctane sulfonate/perfluorooctanoic acid investigations):
inactive area
Miscellaneous notes:
Building 717 potentially had metal plating, according to the 2005 ESA
Health and Safety Considerations
* Please note any health and safety concerns here (e.g., access, overhead/buried utilities, steep terrain, biological hazards).
Overgrown surrounding area

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment

Installation: **Longhorn Army Ammunition Plant** **State:** ***Texas***

Date: 9-Mar-21
Potential Area of Potential Interest (PAOPI) Name: Original Fire Station
Location Description: North of B710 and east of LHAAP-04
Latitude/Longitude:
Field Personnel: Dana Schmidt, Mike Madl
Site Contact/Title: Aaron Williams, Paul Bruckwicki
Weather: 70s, partly sunny

Sources

Recognized Primary Source (circle):

Fire, fire training, **fire station**, nozzle testing, crash site, chromium plating, hangar/aqueous film-forming foam suppression system, auto maintenance, photo processing, fuel spill, pesticide/insecticide use, wash rack, other:

When/Frequency: Unknown
Product Released and Volume: None determined
Other Notes:

Recognized Secondary Source(s) (circle):

Stormwater or sewer system components, wastewater treatment plants, landfills, remediated soil application sites, surface water flow pathway, potential for groundwater infiltration, other:

When: Unknown
Migration Potential:
Other Notes:

Physical Setting of Potential Area of Potential Interest

Topography and floor/ground surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Fire station is surrounded by stormwater drains. There is a steep slope surrounding the site into these drains

Infrastructure (e.g., note entry to sewer system via drop inlets/storm drains/sanitary sewer/wastewater treatment plant, pavement, buildings):

Concrete slab standing

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment

Installation: LHAAP PAOPI: Fire Station Date: 9-Mar-21

On- or off-installation monitoring or drinking water wells (number and proximity to potential area of potential interest, note access and condition of wells):
There are multiple upstream monitoring wells, but no nearby downgradient wells.
Surface water bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):
Small creek nearby to the north
Surface drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):
earthen stormwater ditch surrounding the site. Stormwater flow to the east
Site status (current or past IRP and decision [e.g., no further action, monitored natural attenuation, system], previous remedial actions or other perfluorooctane sulfonate/perfluorooctanoic acid investigations):
currently utilized by USFWS as storage facility for equpment such as boats, ATVs, etc.
Miscellaneous notes:
Station noted in 2005 Phase I ESA as the headquarters. This building was replaced by the newer building in the late 1900s.
Likely used as a storage building. A data gap still exists on where the mentioned 907-C Foamite storage shed may have been
Health and Safety Considerations
* Please note any health and safety concerns here (e.g., access, overhead/buried utilities, steep terrain, biological hazards).
Overgrown surrounding area

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment

Installation: **Longhorn Army Ammunition Plant** **State:** ***Texas***

Date:	9-Mar-21
Potential Area of Potential Interest (PAOPI) Name:	Fire Station
Location Description:	South of B709 and LHAAP-04
Latitude/Longitude:	
Field Personnel:	Dana Schmidt, Mike Madl
Site Contact/Title:	Aaron Williams, Paul Bruckwicki
Weather:	70s, partly sunny

Sources

Recognized Primary Source (circle):

Fire, fire training, **fire station**, nozzle testing, crash site, chromium plating, hangar/aqueous film-forming foam suppression system, auto maintenance, photo processing, fuel spill, pesticide/insecticide use, wash rack, other:

When/Frequency:	Unknown
Product Released and Volume:	None determined
Other Notes:	

Recognized Secondary Source(s) (circle):

Stormwater or sewer system components, wastewater treatment plants, landfills, remediated soil application sites, surface water flow pathway, potential for groundwater infiltration, other:

When:	Unknown
Migration Potential:	
Other Notes:	

Physical Setting of Potential Area of Potential Interest

Topography and floor/ground surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Fire station is surrounded by stormwater drains. There is a steep slope surrounding the site into these drains

Infrastructure (e.g., note entry to sewer system via drop inlets/storm drains/sanitary sewer/wastewater treatment plant, pavement, buildings):

Drinking water well (former) located on southwestern portion of the area.

New storage building was constructed after the buildingwas taken over by USFWS to store hazardous waste.

ARCADIS Design & Consultancy for natural and built assets

Site Reconnaissance Log
Per- and Polyfluoroalkyl Substances Preliminary Assessment

Installation: LHAAP PAOPI: Fire Station Date: 9-Mar-21

On- or off-installation monitoring or drinking water wells (number and proximity to potential area of potential interest, note access and condition of wells):
No longer a drinking water well, but this well is located on southwest corner.
There are multiple upstream monitoring wells, but no nearby downgradient wells.
Surface water bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):
No immediately proximate surface water bodies
Surface drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):
earthen stormwater ditch surrounding the site.
Site status (current or past IRP and decision [e.g., no further action, monitored natural attenuation, system], previous remedial actions or other perfluorooctane sulfonate/perfluorooctanoic acid investigations):
currently utilized by USFWS as office space
Miscellaneous notes:
Health and Safety Considerations
* Please note any health and safety concerns here (e.g., access, overhead/buried utilities, steep terrain, biological hazards).
Overgrown surrounding area

Site Reconnaissance Log

Installation: **Longhorn Army Ammunition Plant** **State:** ***Texas***

Date:	9-Mar-21
Interest (PAOPI) Name:	Original Fire Station
Location Description:	South of B709 and LHAAP-04
Latitude/Longitude:	
Field Personnel:	Dana Schmidt, Mike Madl
Site Contact/Title:	Aaron Williams, Paul Bruckwicki
Weather:	70s, partly sunny

Sources

Recognized Primary Source (circle):

Fire, fire training, fire station, nozzle testing, crash site, chromium plating, hangar/aqueous film-forming foam suppression system, auto maintenance, photo processing, fuel spill, pesticide/insecticide use, wash rack, other:

When/Frequency:	Unknown
Product Released and Volume:	None determined
Other Notes:	

Recognized Secondary Source(s) (circle):

Stormwater or sewer system components, wastewater treatment plants, landfills, remediated soil application sites, surface water flow pathway, potential for groundwater infiltration, other:

When:	Unknown
Migration Potential:	
Other Notes:	

Physical Setting of Potential Area of Potential Interest

Topography and floor/ground surface (note vegetation/pavement, soil composition/color/staining, how surface may influence sampling access, and evidence of erosion especially near point of possible release):

Fire station is surrounded by stormwater drains. There is a steep slope surrounding the site into these drains

Infrastructure (e.g., note entry to sewer system via drop inlets/storm drains/sanitary sewer/wastewater treatment plant, pavement, buildings):

USAEC PFAS PA Program
Site Reconnaissance Log

Installation: LHAAP PAOPI: Fire Station Date: 9-Mar-21

On- or off-installation monitoring or drinking water wells (number and proximity to potential area of potential interest, note access and condition of wells):
No longer a drinking water well, but this well is located on southwest corner.
There are multiple upstream monitoring wells, but no nearby downgradient wells.
Surface water bodies (proximity to and relative drainage direction and receptor, note ponding or standing water nearby):
No immediately proximate surface water bodies
Surface drainage within or adjacent to (natural or manmade, flow direction, lining [stone, vegetation, other], blockages):
Earthen stormwater ditch surrounding the site.
Site status (current or past IRP and decision [e.g., no further action, monitored natural attenuation, system], previous remedial actions or other perfluorooctane sulfonate/perfluorooctanoic acid investigations):
Currently utilized by USFWS as office space
Miscellaneous notes:
Health and Safety Considerations
* Please note any health and safety concerns here (e.g., access, overhead/buried utilities, steep terrain, biological hazards).
Overgrown surrounding area

* Please note any H&S Concerns here (access, overhead/buried utilities, steep terrain, biological hazards, etc.)

APPENDIX H

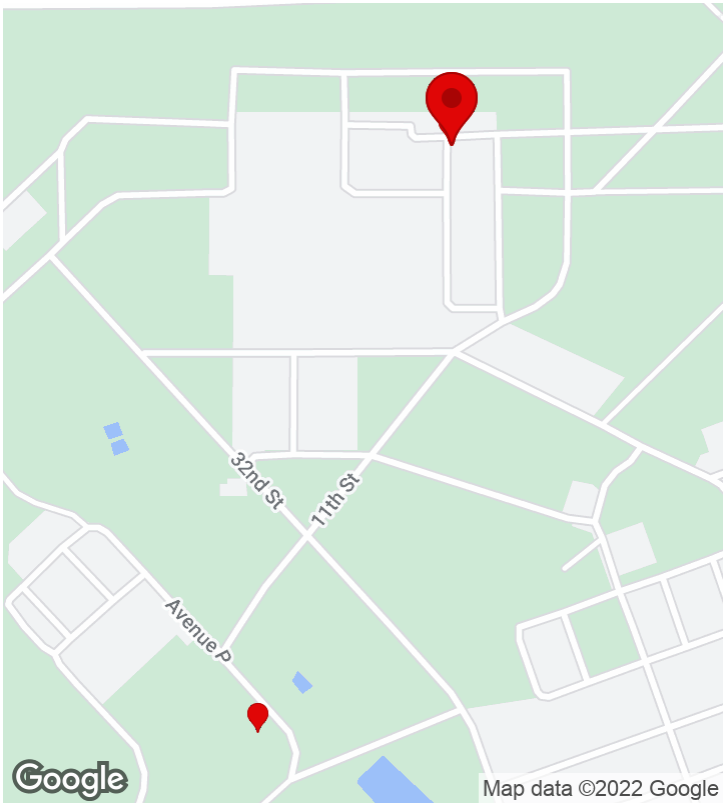
Site Inspection Field Notes

FieldNow - Daily Field Log (Tier 1)

Daily log for field activities to be used to chronicle your daily activities on site. SME: Ian Drost Developer: Brian Webb Updated 2019-12-23 to include equipment section with calibration details

November 11, 2022, US Army Corps of Engineers - Baltimore District, Sampling soil, Andrew Parker, 02118231.3006-Balt HTRW AE PFAS ADDL PAs

11/11/2022, 8:44:08 PM UTC



CREATED

11/11/2022, 5:47:15 PM UTC
by Andrew Parker

UPDATED

11/11/2022, 8:44:08 PM UTC
by Andrew Parker

STATUS

In Progress

LOCATION

32.694306, -94.147617

ASSIGNED TO

Andrew Parker

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	

Basic Information

Select Project Number	30001997, US Army Corps of Engineers - Baltimore District, 02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Date	November 11, 2022
Completed By	Andrew Parker
Purpose	Sampling soil
Weather	Overcast, downpour
PPE	Level D

Daily Log of Activities

Notes (2 Items)

Notes - 1. 07:30, Day started

Time	07:30
Description of Task	Day started

Notes - 2. 14:15, Downpour so sampling stopped

Time	14:15
Description of Task	Downpour so sampling stopped

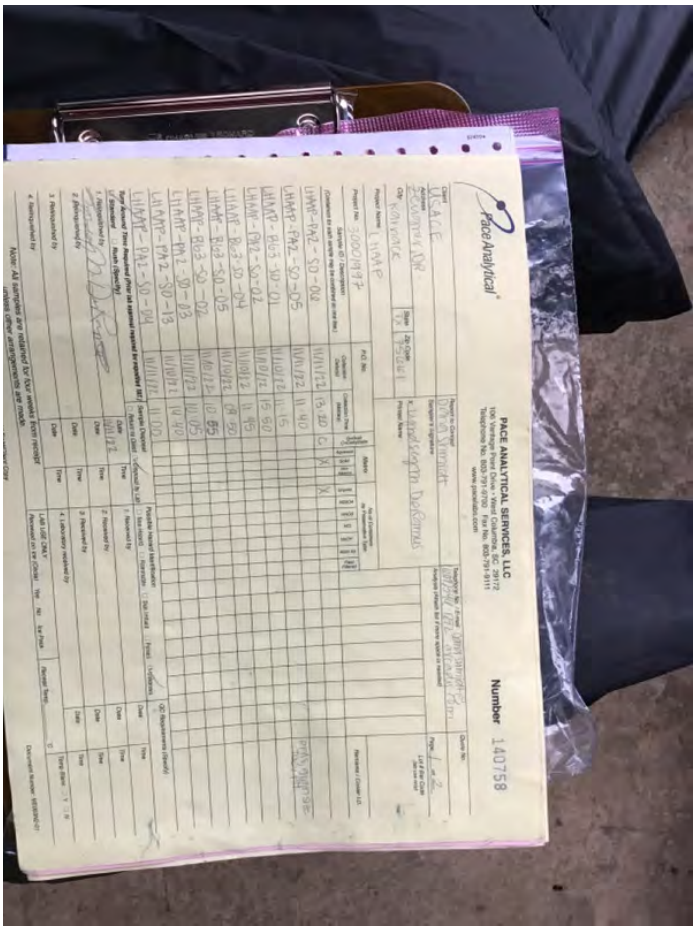
Equipment & Calibration Information

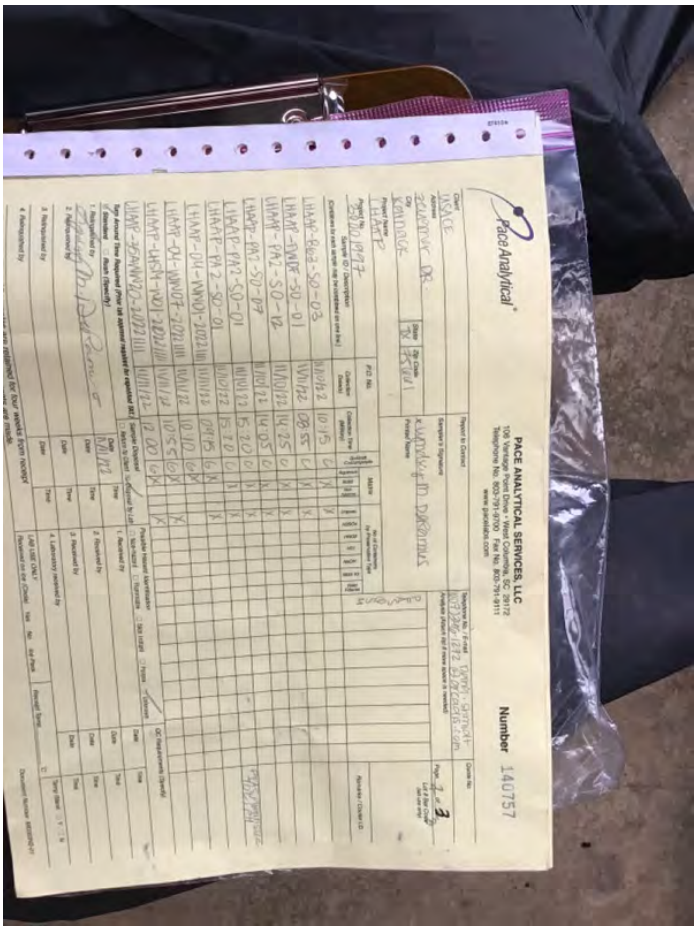
Are you using equipment?	No
List of Equipment Used	

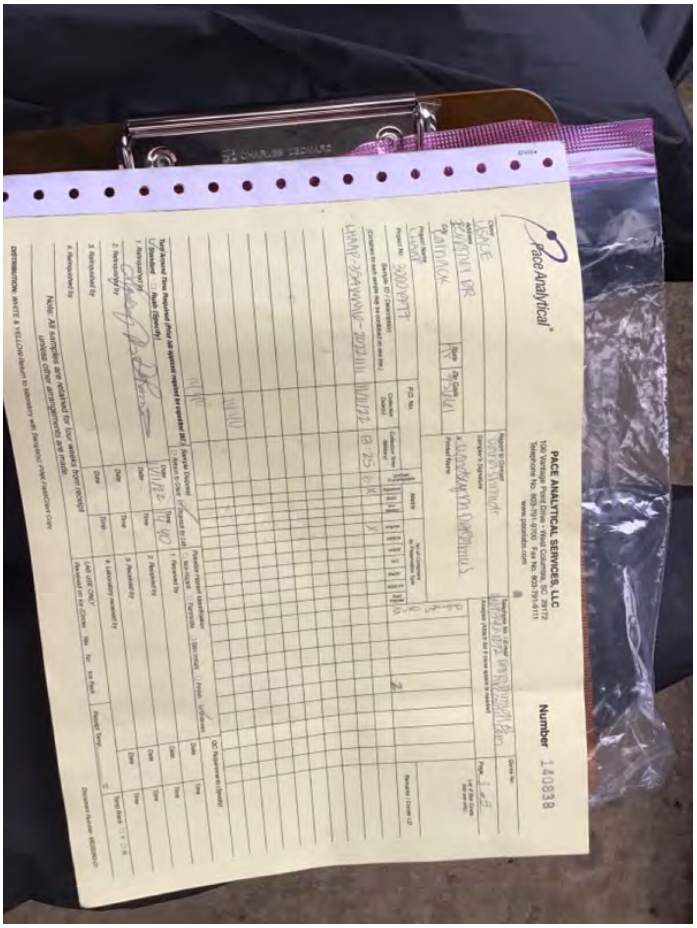
Waste Management

Are there any waste drums on site?	No
Did you drum any waste today?	No
General Waste Comments	
For a more comprehensive drum inventory, please use the Fulcrum app: FieldNow - Waste Log/Inventory (Tier 1)	

COC Photos


Pace Analytical
PACE ANALYTICAL SERVICES, LLC
Number 140758

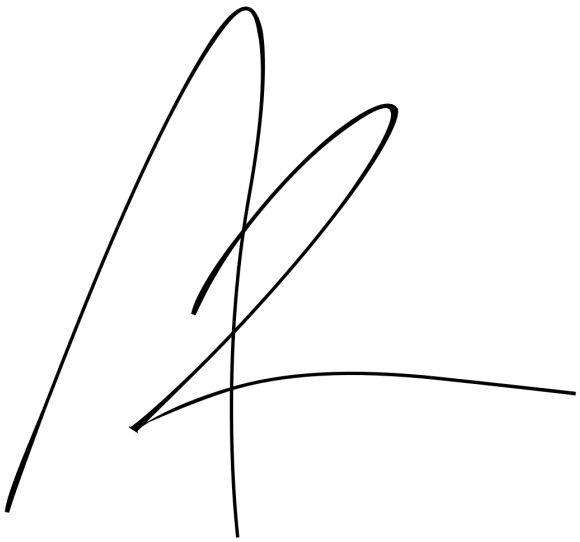

Pace Analytical
PACE ANALYTICAL SERVICES, LLC
Number 140757


Pace Analytical
PACE ANALYTICAL SERVICES, LLC
Number 140838

Photos

Other Photos

Signature



Signed 11/11/2022, 8:43:59 PM UTC

Have you performed work in accordance with the applicable QP/TGI?

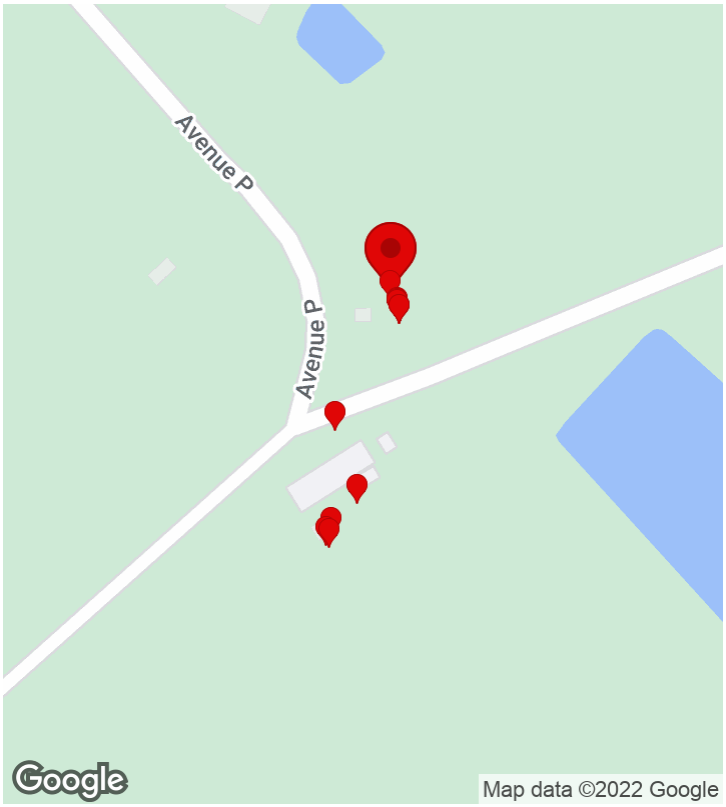
Yes

FieldNow - Daily Field Log (Tier 1)

Daily log for field activities to be used to chronicle your daily activities on site. SME: Ian Drost Developer: Brian Webb Updated 2019-12-23 to include equipment section with calibration details

November 15, 2022, Usace, Drilling activities , Daniel Luneau, LHAAP

11/16/2022, 2:29:20 AM UTC



CREATED

11/15/2022, 7:34:42 PM UTC
by Daniel Luneau

UPDATED

11/16/2022, 2:29:20 AM UTC
by Daniel Luneau

STATUS

In Progress

LOCATION

32.683451, -94.150548

ASSIGNED TO

Daniel Luneau

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	

Basic Information

Select Project Number	
Project Name	LHAAP
Project Number	30001997
Client	Usace
Date	November 15, 2022
Completed By	Daniel Luneau
Purpose	Drilling activities
Weather	40-50°F, cloudy
PPE	Level D

Daily Log of Activities

Notes (11 Items)

Notes - 1. 07:30, Arrive on site, have safety meeting, load equipment move rig to boring LHAAP-ONSF-SO-2

Time	07:30
Description of Task	Arrive on site, have safety meeting, load equipment move rig to boring LHAAP-ONSF-SO-2

Notes - 2. 09:45, Rig hit refusal at 30' bgs. Temp well install because all soil was dry.

Time	09:45
Description of Task	Rig hit refusal at 30' bgs. Temp well install because all soil was dry.

Notes - 3. 22:50, Begin boring LHAAP-ONFS-SO-1

Time	22:50
Description of Task	Begin boring LHAAP-ONFS-SO-1

Notes - 4. 23:45, Soil was possibly wet, hydro punch was used at 24'. No water yielded. Hydropunch pulled out and drillers pushed to refusal.

Time	23:45
Description of Task	Soil was possibly wet, hydro punch was used at 24'. No water yielded. Hydropunch pulled out and drillers pushed to refusal.

Notes - 5. 12:15, Temp well at ONSF-GW-02 was still dry. Drillers hit refusal at 29' bgs on ONFS-SO-01. Temp well installed.

Time	12:15
Description of Task	Temp well at ONSF-GW-02 was still dry. Drillers hit refusal at 29' bgs on ONFS-SO-01. Temp well installed.

Notes - 6. 12:45, Drillers take lunch.

Time	12:45
Description of Task	Drillers take lunch.

Notes - 7. 13:45, Drillers return and pack up rig and drum soil cuttings to move to the next location.

Time	13:45
Description of Task	Drillers return and pack up rig and drum soil cuttings to move to the next location.

Notes - 8. 14:10, Meet with local maintenance regarding utilities and meet with PM.

Time	14:10
Description of Task	Meet with local maintenance regarding utilities and meet with PM.

Notes - 9. 14:54, Mob to LGAAP-ONFS-SO-03

Time	14:54
Description of Task	Mob to LGAAP-ONFS-SO-03

Notes - 10. 16:10, Complete LHAAP-ONFS-SO-03 with a temp well and move to LHAAP-ONFS-SO-04.

Time	16:10
Description of Task	Complete LHAAP-ONFS-SO-03 with a temp well and move to LHAAP-ONFS-SO-04.

Notes - 11. 17:20, TD ONSF-04 at 25' due to refusal and depart site.

Time	17:20
Description of Task	TD ONSF-04 at 25' due to refusal and depart site.

Equipment & Calibration Information

Are you using equipment?	No
List of Equipment Used	

Waste Management

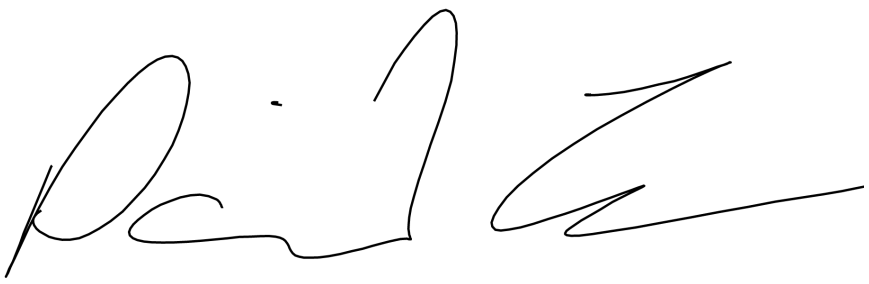
Are there any waste drums on site?	No
Did you drum any waste today?	Yes
Number of Drums Created during Activities	1
Size of Drums	55-gallon
Type of Drum	steel
Condition of Drums	Good
General Waste Comments	
For a more comprehensive drum inventory, please use the Fulcrum app: FieldNow - Waste Log/Inventory (Tier 1)	

COC Photos

Photos

Other Photos

Signature



Signed 11/16/2022, 2:21:05 AM UTC

Have you performed work in accordance with the applicable QP/TGI?

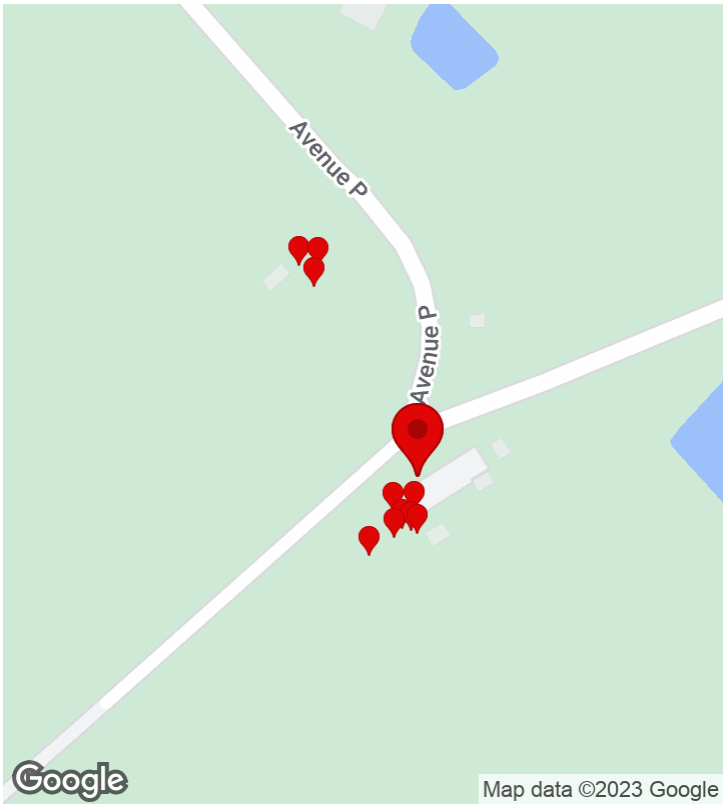
Yes

FieldNow - Daily Field Log (Tier 1)

Daily log for field activities to be used to chronicle your daily activities on site. SME: Ian Drost Developer: Brian Webb Updated 2019-12-23 to include equipment section with calibration details

November 16, 2022, US Army Corps of Engineers - Baltimore District, Drilling activities , Daniel Luneau, LHAAP

2/27/2023, 10:34:14 PM UTC



CREATED

11/16/2022, 5:42:21 PM UTC
by Daniel Luneau

UPDATED

2/27/2023, 10:34:14 PM UTC
by Daniel Luneau

STATUS

In Progress

LOCATION

32.682659, -94.151008

ASSIGNED TO

Daniel Luneau

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	

Basic Information

Select Project Number	
Project Name	LHAAP
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Date	November 16, 2022
Completed By	Daniel Luneau
Purpose	Drilling activities
Weather	35-55°F, clear
PPE	Level D

Daily Log of Activities

Notes (9 Items)

Notes - 1. 07:30, Arrive on site. Attend tailgate safety meeting.

Time	07:30
Description of Task	Arrive on site. Attend tailgate safety meeting.

Notes - 2. 09:00, Move to container storage area. PM told to stop work to revise drilling plan.

Time	09:00
Description of Task	Move to container storage area. PM told to stop work to revise drilling plan.

Notes - 3. 11:00, Sample ONFS-GW-02 and ONFS-GW-03.

Time	11:00
Description of Task	Sample ONFS-GW-02 and ONFS-GW-03.

Notes - 4. 11:55, Set up on ONFS-GW-04 to attempt a hydropunch sample.

Time	11:55
Description of Task	Set up on ONFS-GW-04 to attempt a hydropunch sample.

Notes - 5. 12:26, Rig hit refusal at 39' bgs with hydropunch. The drill pipe is stuck in tight material. Drillers are attempting to get pipe unstuck.

Time	12:26
Description of Task	Rig hit refusal at 39' bgs with hydropunch. The drill pipe is stuck in tight material. Drillers are attempting to get pipe unstuck.

Notes - 6. 14:00, Drillers go to lunch.

Time	14:00
Description of Task	Drillers go to lunch.

Notes - 7. 15:15, Finish collecting available water samples in temp Wells. Drillers return from lunch. ONFS-02 and ONFS-03 were plugged when the drillers returned.

Time	15:15
Description of Task	Finish collecting available water samples in temp Wells. Drillers return from lunch. ONFS-02 and ONFS-03 were plugged when the drillers returned.

Notes - 8. 16:15, Drillers plug wells and depart site. The Drillers did not have the appropriate augers to drill out the pipe that was stuck in the ground. The drillers depart site with the intention of mobilizing back the week of 11/28/22 to auger out the pipe stuck in the ground and to complete drilling activities.

Time	16:15
Description of Task	Drillers plug wells and depart site. The Drillers did not have the appropriate augers to drill out the pipe that was stuck in the ground. The drillers depart site with the intention of mobilizing back the week of 11/28/22 to auger out the pipe stuck in the ground and to complete drilling activities.

Notes - 9. 18:00, Arcadis stores gear for the night and departs site.

Time	18:00
Description of Task	Arcadis stores gear for the night and departs site.

Equipment & Calibration Information

Are you using equipment?	Yes

Equipment Information (1 Item)

Equipment Information - 1. Water Quality Meter (i.e. YSI), Horiba U-52, Pine

Supplier	Pine
Type of Equipment	Water Quality Meter (i.e. YSI)
Model	Horiba U-52
Rental Number	
Serial Number	
Calibrated?	Yes
Bump checked?	
Calibration/bump check time	

Water Quality Meter Calibration Information

Manufacturer of Calibration Fluids	

Calibration Standards

Notes	
Calibration Documents present from supplier?	No
Calibration Documents	
Calibration Passed?	Yes
List of Equipment Used	Water Quality Meter (i.e. YSI)

Waste Management

Are there any waste drums on site?	Yes
Number of Drums upon Arrival	1
Size of Drums	55-gallon
Type of Drums	steel
Condition of Drums	Good
Did you drum any waste today?	Yes
Number of Drums Created during Activities	1
Size of Drums	55-gallon

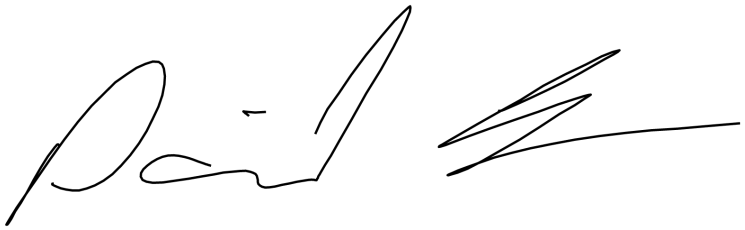
Type of Drum	steel
Condition of Drums	Good
General Waste Comments	
For a more comprehensive drum inventory, please use the Fulcrum app: FieldNow - Waste Log/Inventory (Tier 1)	

COC Photos

Photos

Other Photos

Signature



Signed 11/16/2022, 5:57:51 PM UTC

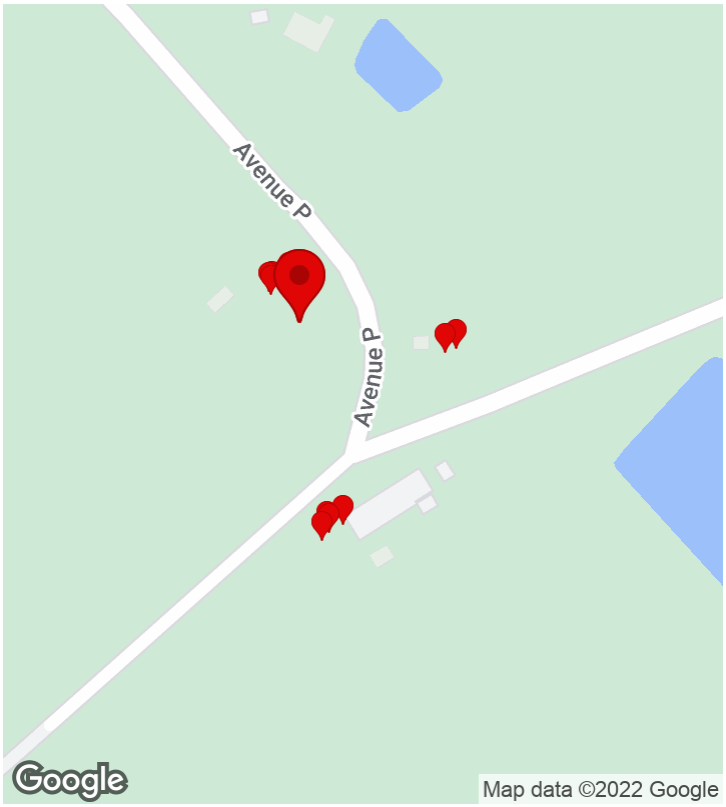
Have you performed work in accordance with the applicable QP/TGI?	Yes

FieldNow - Daily Field Log (Tier 1)

Daily log for field activities to be used to chronicle your daily activities on site. SME: Ian Drost Developer: Brian Webb Updated 2019-12-23 to include equipment section with calibration details

November 28, 2022, USACE, Drilling Activities , Daniel Luneau, LHAAP

11/28/2022, 10:45:41 PM UTC



CREATED

11/28/2022, 5:47:03 PM UTC
by Daniel Luneau

UPDATED

11/28/2022, 10:45:41 PM UTC
by Daniel Luneau

STATUS

In Progress

LOCATION

32.683458, -94.151345

ASSIGNED TO

Daniel Luneau

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	

Basic Information

Select Project Number	
Project Name	LHAAP
Project Number	30001997
Client	USACE
Date	November 28, 2022
Completed By	Daniel Luneau
Purpose	Drilling Activities
Weather	66°F, clear.
PPE	Level D

Daily Log of Activities

Notes (11 Items)

Notes - 1. 11:00, Arrive on site and await driller.

Time	11:00
Description of Task	Arrive on site and await driller.

Notes - 2. 11:35, Conduct safety meeting with driller and review plan.

Time	11:35
Description of Task	Conduct safety meeting with driller and review plan.

Notes - 3. 12:00, The drillers moved the rig to ONFS-SO-04 to auger to water or 45' bgs and to retrieve hydropunch that was stuck in the ground.

Time	12:00
Description of Task	The drillers moved the rig to ONFS-SO-04 to auger to water or 45' bgs and to retrieve hydropunch that was stuck in the ground.

Notes - 4. 13:20, Boring TD'd at 45' bgs. 41-45' was saturated. 20' of screen was used. Drillers moves on to attempting to extract hydropunch.

Time	13:20
Description of Task	Boring TD'd at 45' bgs. 41-45' was saturated. 20' of screen was used. Drillers moves on to attempting to extract hydropunch.

Notes - 5. 13:45, Drillers leaves hydropunch for now and mobilizes to ONFS-SO-01.

Time	13:45
Description of Task	Drillers leaves hydropunch for now and mobilizes to ONFS-SO-01.

Notes - 6. 14:20, Begins drilling ONFS-SO-01 after probing.

Time	14:20
Description of Task	Begins drilling ONFS-SO-01 after probing.

Notes - 7. 15:00, Boring was offset approximately 15' southwest due to surface water seeping into boring.

Time	15:00
Description of Task	Boring was offset approximately 15' southwest due to surface water seeping into boring.

Notes - 8. 15:40, Sample ONFS-GW-01 was collected.

Time	15:40
Description of Task	Sample ONFS-GW-01 was collected.

Notes - 9. 16:05, Sample ONFS-GW-04 was collected.

Time	16:05
Description of Task	Sample ONFS-GW-04 was collected.

Notes - 10. 16:35, Samples were labeled and logged.

Time	16:35
Description of Task	Samples were labeled and logged.

Notes - 11. 16:45, Arcadis left site along with the drillers

Time	16:45
Description of Task	Arcadis left site along with the drillers

Equipment & Calibration Information

Are you using equipment?	No
List of Equipment Used	

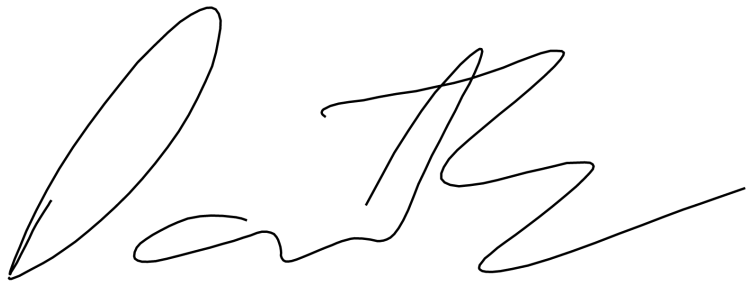
Waste Management

Are there any waste drums on site?	Yes
Number of Drums upon Arrival	2
Size of Drums	55-gallon
Type of Drums	steel
Condition of Drums	Good
Did you drum any waste today?	Yes
Number of Drums Created during Activities	2
Size of Drums	55-gallon
Type of Drum	steel
Condition of Drums	Good
General Waste Comments	
For a more comprehensive drum inventory, please use the Fulcrum app: FieldNow - Waste Log/Inventory (Tier 1)	

COC Photos

Photos

Other Photos

Signature	 Signed 11/28/2022, 5:55:36 PM UTC
Have you performed work in accordance with the applicable QP/TGI?	Yes

FieldNow - Daily Field Log (Tier 1)

Daily log for field activities to be used to chronicle your daily activities on site. SME: Ian Drost Developer: Brian Webb Updated 2019-12-23 to include equipment section with calibration details

November 29, 2022, USACE, Drilling activities , Daniel Luneau, LHAAP

11/30/2022, 12:37:49 AM UTC

CREATED

11/29/2022, 1:46:15 PM UTC
by Daniel Luneau

UPDATED

11/30/2022, 12:37:49 AM UTC
by Daniel Luneau

STATUS

In Progress

LOCATION

32.683458, -94.151594

ASSIGNED TO

Daniel Luneau

Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	

Basic Information

Select Project Number	
Project Name	LHAAP
Project Number	30001997
Client	USACE
Date	November 29, 2022
Completed By	Daniel Luneau
Purpose	Drilling activities
Weather	70
PPE	Level D

Daily Log of Activities

Notes (13 Items)

Notes - 1. 07:30, Arrive on site and hold safety meeting with drillers

Time	07:30
Description of Task	Arrive on site and hold safety meeting with drillers

Notes - 2. 08:15, Begin boring HWSA-SO-01

Time	08:15
Description of Task	Begin boring HWSA-SO-01

Notes - 3. 08:20, Collect HWSA-SO-01 soil.

Time	08:20
Description of Task	Collect HWSA-SO-01 soil.

Notes - 4. 09:00, encountered water at 25' while drilling. Boring and temp well advanced to 30'.

Time	09:00
Description of Task	encountered water at 25' while drilling. Boring and temp well advanced to 30'.

Notes - 5. 09:30, Water column was approximately 1-2'. Barely enough water to sample. No parameters were taken and boring was closed due to drizzly and rainy conditions.

Time	09:30
Description of Task	Water column was approximately 1-2'. Barely enough water to sample. No parameters were taken and boring was closed due to drizzly and rainy conditions.

Notes - 6. 10:30, Rig was loaded and mobilized to the next location.

Time	10:30
Description of Task	Rig was loaded and mobilized to the next location.

Notes - 7. 23:00, Set up on CSA-GW-01

Time	23:00
Description of Task	Set up on CSA-GW-01

Notes - 8. 23:40, Water was found while drilling at 21' bgs. Temp well was setup to 25' bgs.

Time	23:40
Description of Task	Water was found while drilling at 21' bgs. Temp well was setup to 25' bgs.

Notes - 9. 12:00, Sample CSA-GW-01 was collected and parameters were collected.

Time	12:00
Description of Task	Sample CSA-GW-01 was collected and parameters were collected.

Notes - 10. 13:30, Well at CSA-GW-01 was plugged an drillers went to lunch.

Time	13:30
Description of Task	Well at CSA-GW-01 was plugged an drillers went to lunch.

Notes - 11. 14:30, Drillers attempt to pull some pipe from ONFS-GW-04. Some piping was recovered. Boring was Plugged.

Time	14:30

Description of Task	Drillers attempt to pull some pipe from ONFS-GW-04. Some piping was recovered. Boring was Plugged.

Notes - 12. 16:30, Drillers move drums and containerize IDW. Drillers depart.

Time	16:30
Description of Task	Drillers move drums and containerize IDW. Drillers depart.

Notes - 13. 17:00, Contaminated disposables we're containerized. Arcadis departs site.

Time	17:00
Description of Task	Contaminated disposables we're containerized. Arcadis departs site.

Equipment & Calibration Information

Are you using equipment?	No
List of Equipment Used	

Waste Management

Are there any waste drums on site?	Yes
Number of Drums upon Arrival	1
Size of Drums	55-gallon
Type of Drums	steel
Condition of Drums	Good
Did you drum any waste today?	Yes
Number of Drums Created during Activities	3
Size of Drums	55-gallon
Type of Drum	steel
Condition of Drums	Good
General Waste Comments	One additional drum of soil cuttings was generated and two additional drums of contaminated PPE was generated.
For a more comprehensive drum inventory, please use the Fulcrum app: FieldNow - Waste Log/Inventory (Tier 1)	

COC Photos

Photos

Other Photos

Signature

Signed 11/30/2022, 12:27:52 AM UTC

Have you performed work in accordance with the applicable QP/TGI?

Yes

LHAPP 11-14-2022 29

Task: continue gw sampling
Partners: Isidro Hdz. + Laura Gloria

7:30 : Arrive on site
7:40 : Lyndsey led tailgate
7:50 : Isidro discussed game plan & eq. was loaded. Isidro & Laura will continue to sample using peri pump.
7:55 : & Team ~~stopped~~ paused before beginning due to drizzle.
Team is anticipating rain later today
8:10 - Team resumed activities
8:15 - 12:00 : Laura & Isidro sampled the following wells using a peri pump. -9:55
35AWW06 - FD-13MS/MSD @ 09:50 am (vehicle wash rack)
50WW12 @ - 10:55 am
50WW13 @ - 11:40 am
12:05 - heavy rain. Stopped work
12:30 - Team decided to wait out rain till 1 pm, if not call it a day. Rain is anticipated for the whole day
Lunch also taken!

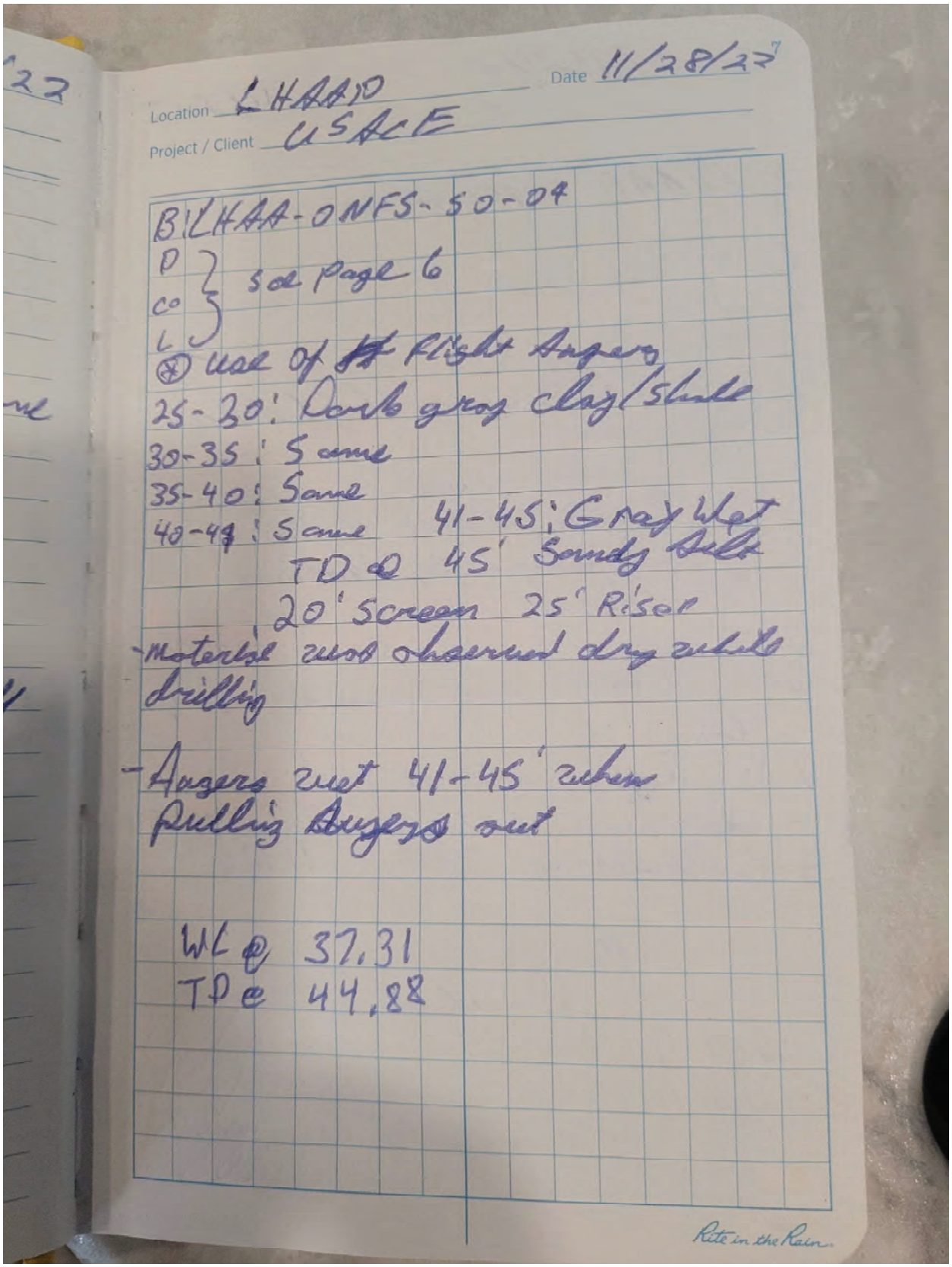
Rite in the Rain

30

1300pm - Teams regrouped at the warehouse & called it a day due to heavy rain
-eq unloaded

13:15pm - Team departed
Isidro locked up

waste = 10 gallons of purge water



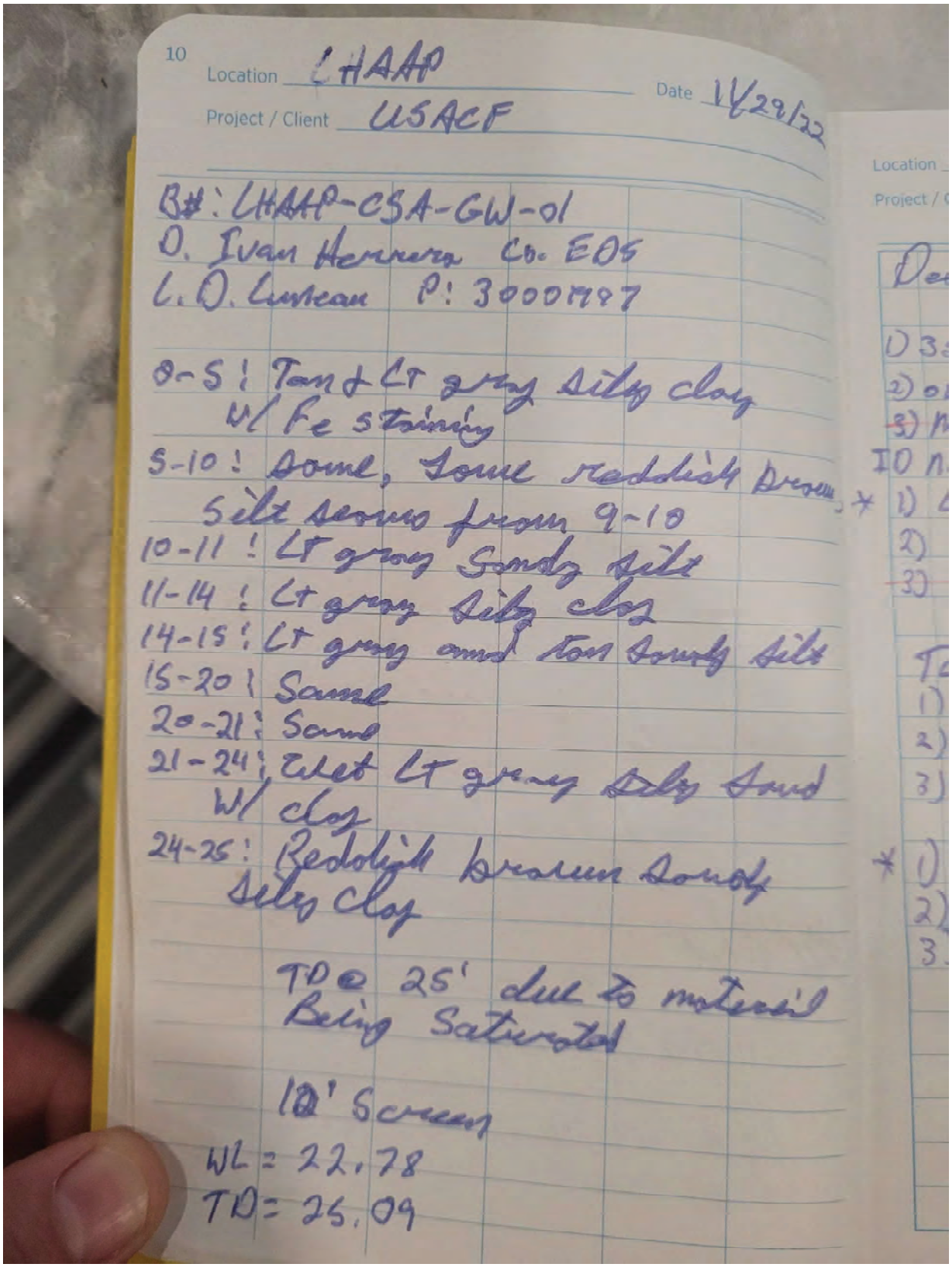
Location LHAAD
Project / Client USACE
Date 11/28/17

BILHAA-ONFS-50-04
P
Co } see Page 6
L
⊛ use of ~~H~~ Flight Augers
25-30: Dark gray clay/shale
30-35: Same
35-40: Same
40-41: Same 41-45: Gray Wet
TD @ 45' Sandy Silt
20' Screen 25' Riser
- Materials used observed dry while drilling

- Augers wet 41-45' when pulling Augers out

WL @ 37.31
TD @ 44.88

Rite in the Rain



10

Location LHAAP

Project / Client USACE

Date 11/29/22

B#: LHAAP-CSA-GW-01
O. Ivan Herrera Co. EOS
L.O. Lutcan P: 3000787

0-5 : Tan & Lt gray silty clay
w/ Fe staining
5-10 : Some, some reddish brown
Silt seams from 9-10
10-11 : Lt gray Sandy silt
11-14 : Lt gray silty clay
14-15 : Lt gray and tan sandy silt
15-20 : Same
20-21 : Same
21-24 : Wet Lt gray silty sand
w/ clay
24-25 : Reddish brown sandy
silty clay

TD @ 25' due to material
being Saturated

10' Screen
WL = 22.78
TD = 25.09

Location LHAAP Date 11/29/23

Project / Client USACE 30001897

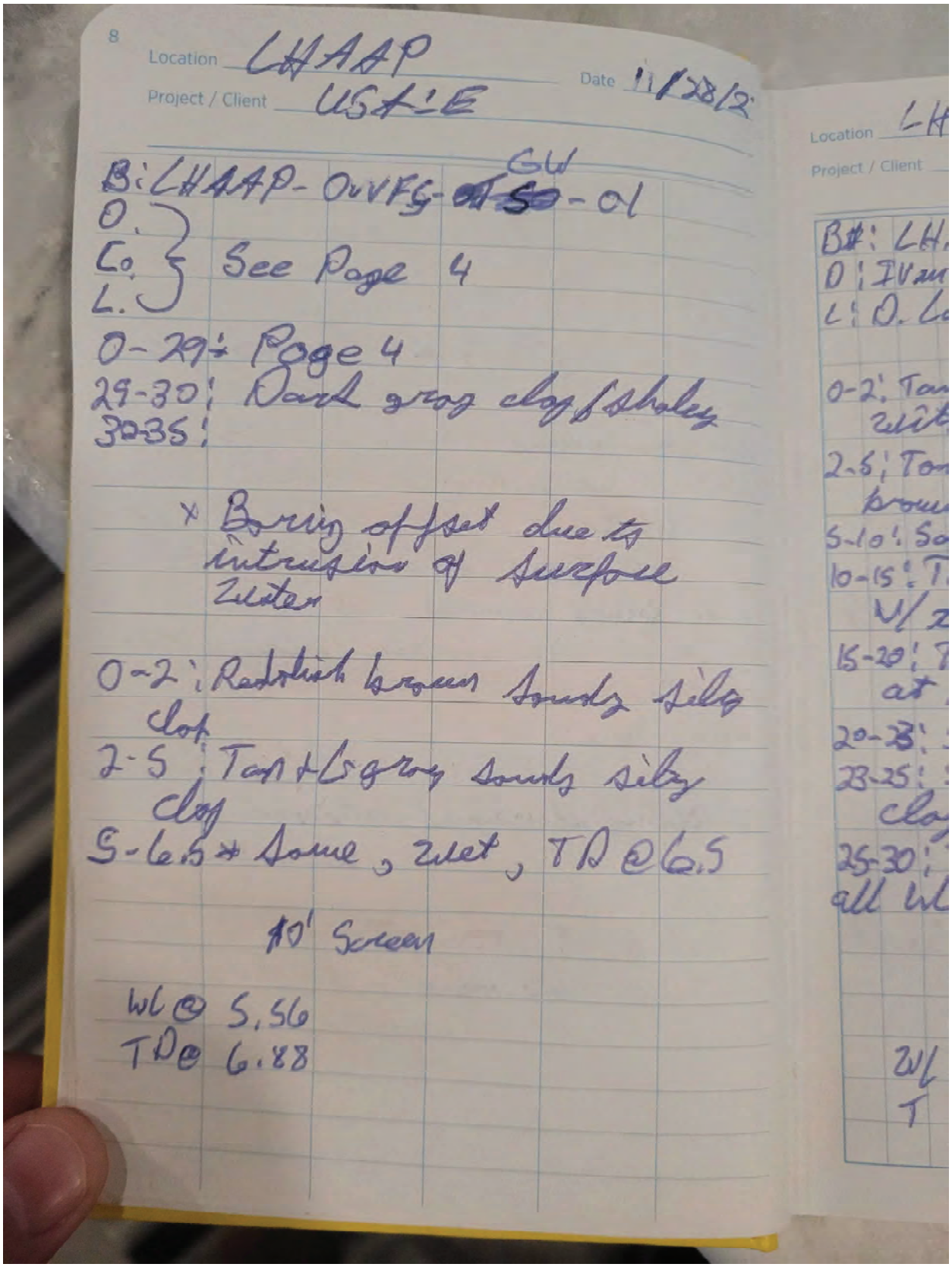
B#: LHAAP-HWSA-50-01
D: Ivan Herrera Co. EDS
L: D. Linear

0-2: Tan & reddish brown silty clay with some sand & gravel
2-5: Tan, olive brown, & reddish brown silty clay
5-10: Sand
10-15: Tan & lt gray silty clay w/ trace sand
15-20: Tan silty clay, moist at bottom
20-23: Sand
23-25: ~~Tan~~ Tan, sandy silty clay ~~with~~ Moist to wet
25-30: Tan sandy silty clay all wet

TD @ 30
10' Screen

W/L @ 28.33
T @ 30.10

Rite in the Rain



8

Location LHAAP

Project / Client USACE

Date 11/28/12

B: LHAAP-OUVFG-GW-01

O.
Co. } See Page 4
L.

0-29 ÷ Page 4

29-30: Dark gray clay & shale

30-35:

× Boring offset due to intrusion of surface water

0-2: Reddish brown sandy silty clay

2-5: Tan & Gray sandy silty clay

5-6.5 × Same, wet, TD @ 6.5

10' Screen

WL @ 5.56

TD @ 6.88

Location LH

Project / Client

B#: LH

O: IV

L: O. L

0-2: Tan

wit

2-5: Tan

brow

5-10: Sa

10-15: T

W/ s

15-20: T

at

20-23:

23-25:

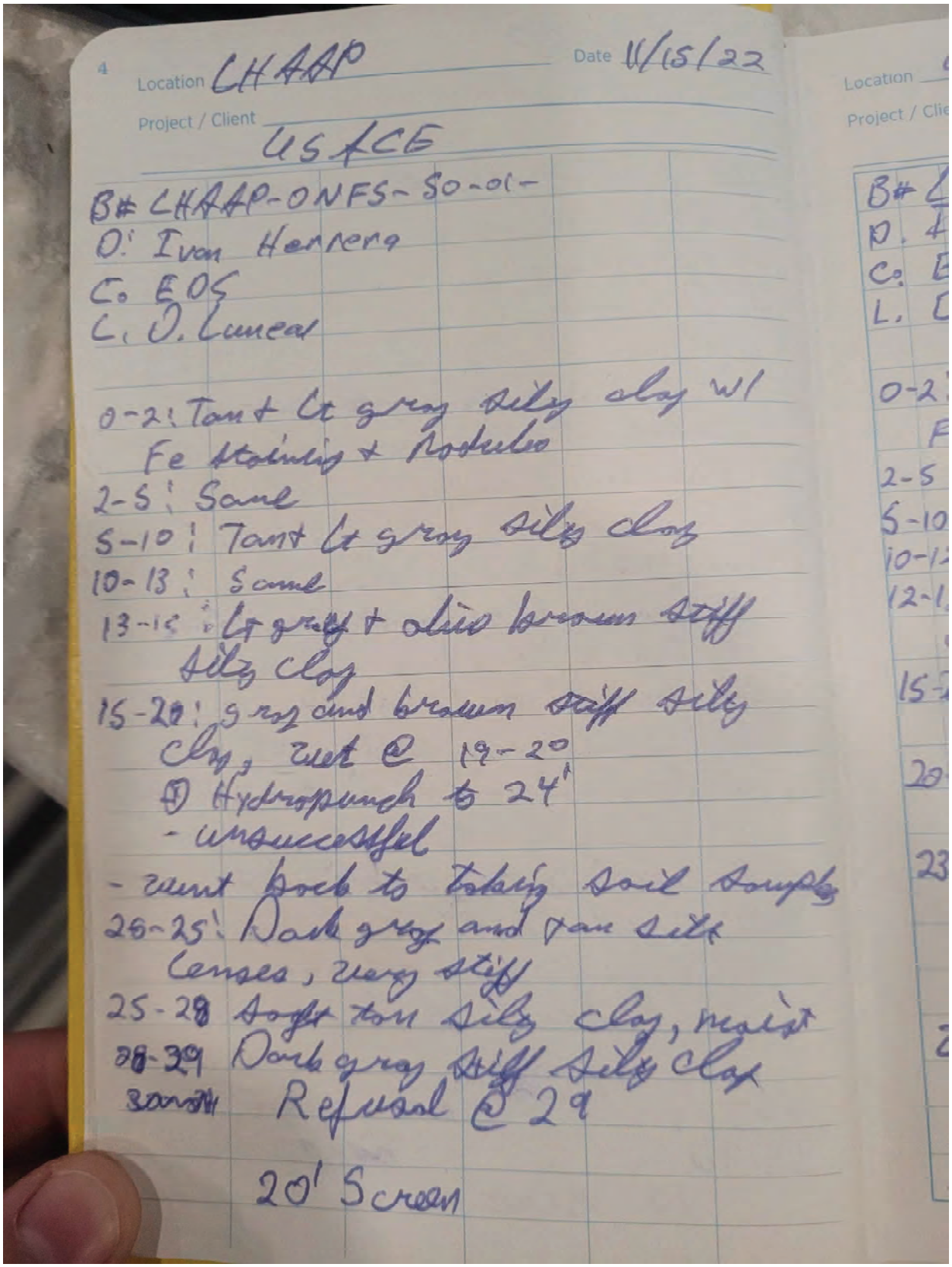
cla

25-30:

all wi

WL

T



4

Location CHAAP Date 11/15/22

Project / Client USACE

B# CHAAP-ONFS-SO-01-

O: Ivan Herrera

C. EOS

C. D. Lunea

0-2: Tan + Lt gray silty clay w/ Fe staining + Nodules

2-5: Same

5-10: Tan + Lt gray silty clay

10-13: Same

13-15: Lt gray + olive brown stiff silty clay

15-20: gray and brown stiff silty clay, wet @ 19-20

- Hydropunch to 24'
- unsuccessful

- went back to take soil samples

20-25: Dark gray and tan silt lenses, very stiff

25-28 Light tan silty clay, moist

28-29 Dark gray stiff silty clay

30 min Refusal @ 29

20' Screen

Location LHAAP Date 11/15/22 3

Project / Client USACE

B# LHAAP-ONE-60-02-111522
D. Ivan Herrero
Co. EnviroTech
L. D. Lunceford

0-2: Medium to Light gray silty clay w/ some Fe stn & nods
2-6: Same
6-10: Lt gray silty clay with silt lenses & Fe staining
10-15: Tan to Lt gray silty clay w/ Fe staining
15-20: Tan & Lt gray stiff silty clay
20-23: Same
23-25: Dark gray clay w/ Tan silt lenses & Very stiff
25-27: Moist tan silty clay
27-30: Dark gray clay, Refusal @ 30'

WL 28.96'

TD @ 30'

10' Screen

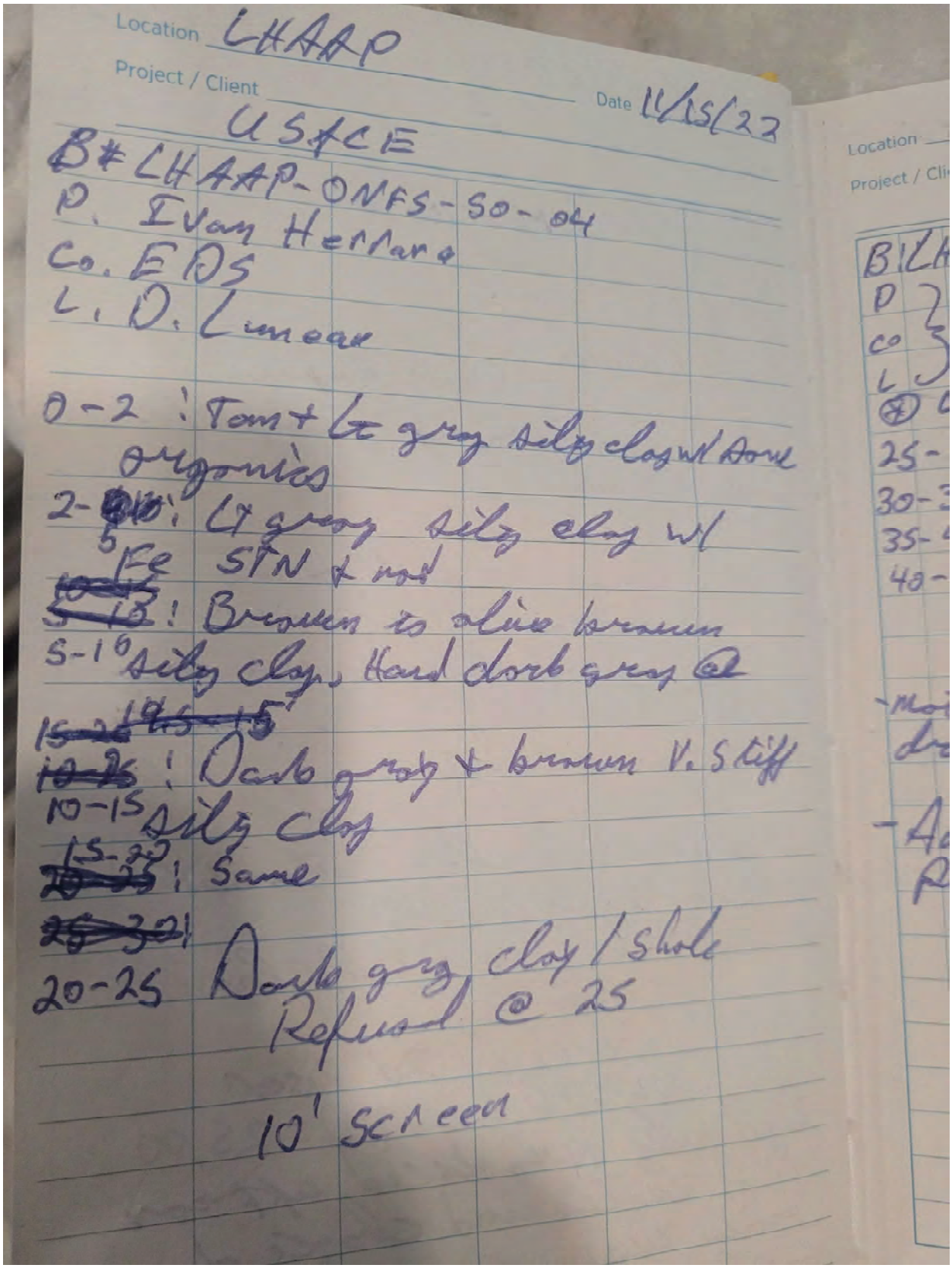
TD 30.08

Location LHAAP Date 11/15/22
Project / Client USACE

B# LHAAP-ONFS-50-03
D. Evan Herne
C. EDS
L. O. Limoges

0-2: Tan & Lt gray silty clay w/ Fe Stn & Nod
2-5: Same
5-10: Same, more stiff
10-12: Same
12-15: Tan and olive brown silty clay, very stiff
15-20: Same, 16-17 moist, & dry, not saturated
20-23: Tan silty clay, Saturated (Wet) @ 21-23
23-25: Dark gray stiff clay
TD @ 25
10' Screen 20' Riser
WL = 14.62 TD = 25.00
Well easily developed approx 10' of water and choke of rock sump increasing
- Closed Well - Slow Recharge

Rite in the Rain



Location LHAAP

Project / Client USACE

Date 11/15/22

B*LHAAP-ONFS-50-04

P. Evan Herrara

Co. EDS

L. D. Linear

0-2 : Tan + Lt grey silty clay w/ Some organics

2-5 : Lt grey silty clay w/ Fe stn & rnd

5-10 : Brown to olive brown silty clay, Hard dark grey @ 15

15-20 : Dark grey & brown V. S Stiff

10-15 silty clay

15-20 : Same

20-25 Dark grey clay / shale

Refusal @ 25

10' Screen

APPENDIX I

Site Inspection Field Forms

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-14 19:33:39 UTC by Laura Gloria
Updated	2022-11-15 15:56:09 UTC by Laura Gloria
Location	32.6833862671933, -94.15154683412439
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Select Project Number	30001997, US Army Corps of Engineers - Baltimore District, 02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Model	YSI 556 MPS
Serial Number(s)	4336
Sampler	Laura Gloria
Date	2022-11-14
Calibration Type?	Single Point Calibration, Single Point and Turbidity Calibration

Turbidity Calibration

Lot Number	26D (10NTU), 34D (20, 100, 800NTU),
Expiration Date	2023-06-01

13:15, 0, 19.5, yes

Pre Calibration	0
Post Calibration	19.5
Calibration Within Range	Yes
Time	13:15

13:15, 0, 100, yes

Pre Calibration	0
Post Calibration	100
Calibration Within Range	Yes
Time	13:15

13:15, 0, 10, yes

Pre Calibration	0
Post Calibration	10
Calibration Within Range	Yes
Time	13:15

01:15, 0, 800, yes

Pre Calibration	0
Post Calibration	800
Calibration Within Range	Yes
Time	01:15

Single Point Calibration

Lot Number	2GH670 (pH4), 2GI304 (pH7), 2GH903 (pH10), 2GI566 (COND), 2GJ570 (ORP)
Expiration Date	2023-07-01
Calibrated Parameters	pH, Conductivity, ORP

13:15

Calibration Range for pH - +/- 0.2 S.U	
Time	13:15
pH Pre Calibration	4.02
pH Post Calibration	4
pH Calibration Within Range	Yes

13:15

Calibration Range for pH - +/- 0.2 S.U	
Time	13:15
pH Pre Calibration	7.01
pH Post Calibration	7
pH Calibration Within Range	Yes

13:15

Calibration Range for pH - +/- 0.2 S.U	
Time	13:15
pH Pre Calibration	10.04
pH Post Calibration	10
pH Calibration Within Range	Yes

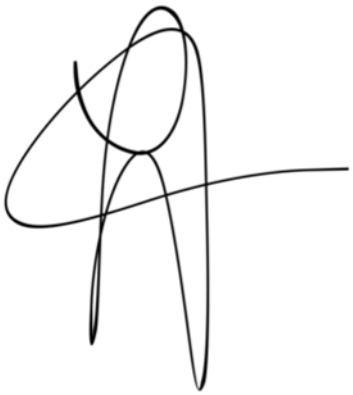
1426

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	13:22
Conductivity Pre Calibration	1426
Conductivity Post Calibration	1413
Conductivity Calibration Within Range	Yes

196

Calibration Range for ORP- +/- 25mV	
Time	13:23
ORP Pre Calibration	196
ORP Post Calibration	220
ORP Calibration Within Range	Yes
Notes	Calibrating for ph, conductivity, and ORP for GW sampling

Signed



Signed 2022-11-14 19:33:53 UTC

Date	2022-11-14
Checked By	Laura Gloria
Date	2022-11-14
Have you performed work in accordance with the applicable QP/TGI?	Yes

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-16 14:21:42 UTC by Andrew Parker
Updated	2022-11-17 14:19:07 UTC by Andrew Parker
Location	32.68367561049078, -94.15168337532705
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

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Project Details

Select Project Number	30001997, US Army Corps of Engineers - Baltimore District, 02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Model	YSI 556 MPS
Serial Number(s)	4337
Sampler	Andrew Parker
Date	2022-11-16
Calibration Type?	Single Point Calibration

Single Point Calibration

Lot Number	2GH670(ph4) , 2GI304 (ph7),2GH903 (ph10),2GI566(COND), 2GJ570 (ORP)
Expiration Date	2023-07-01
Calibrated Parameters	pH, Conductivity, ORP

08:52

Calibration Range for pH - +/- 0.2 S.U	
Time	08:52
pH Pre Calibration	4.54
pH Post Calibration	4
pH Calibration Within Range	Yes

08:55

Calibration Range for pH - +/- 0.2 S.U	
Time	08:55
pH Pre Calibration	6.93
pH Post Calibration	7
pH Calibration Within Range	Yes

09:00

Calibration Range for pH - +/- 0.2 S.U	
Time	09:00

pH Pre Calibration	9.88
pH Post Calibration	10
pH Calibration Within Range	Yes

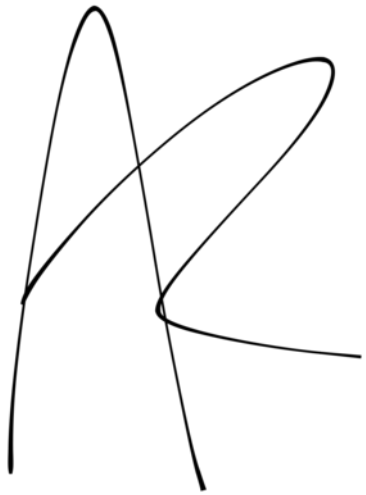
1.589

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:45
Conductivity Pre Calibration	1.589
Conductivity Post Calibration	1.413
Conductivity Calibration Within Range	Yes

179.3

Calibration Range for ORP- +/- 25mV	
Time	08:30
ORP Pre Calibration	179.3
ORP Post Calibration	220.1
ORP Calibration Within Range	Yes

Signed



Signed 2022-11-16 14:57:49 UTC

Date	2022-11-16
Checked By	Lyndsey DeRamus
Date	2022-11-16
Have you performed work in accordance with the applicable QP/TGI?	Yes

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-17 14:31:05 UTC by Andrew Parker
Updated	2022-11-17 14:34:08 UTC by Andrew Parker
Location	32.68360704652284, -94.1517397855354
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Serial Number(s)	4337
Sampler	Andrew Parker
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	ORP

208.7

Calibration Range for ORP- +/- 25mV	
Time	08:34
ORP Pre Calibration	208.7
ORP Post Calibration	220
ORP Calibration Within Range	Yes
Have you performed work in accordance with the applicable QP/TGI?	Yes

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-17 14:34:09 UTC by Andrew Parker
Updated	2022-12-13 21:28:54 UTC by Lyndsey DeRamus
Location	32.6836018917, -94.1517267936
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

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Project Details

Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Serial Number(s)	4337
Sampler	Andrew Parker
Date	2022-11-17
Calibration Type?	Single Point Calibration

Single Point Calibration

Calibrated Parameters	Conductivity

2.138

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	08:36
Conductivity Pre Calibration	2.138
Conductivity Post Calibration	1.41
Conductivity Calibration Within Range	Yes

Signed

Signed 2022-11-17 20:38:53 UTC

Date	2022-11-17
Checked By	Lyndsey DeRamus
Date	2022-11-17
Have you performed work in accordance with the applicable QP/TGI?	Yes

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-28 16:19:02 UTC by Laura Gloria
Updated	2022-12-13 17:27:38 UTC by Laura Gloria
Location	32.6833862671933, -94.15154683412439
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Select Project Number	30001997, US Army Corps of Engineers - Baltimore District, 02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Model	YSI 556 MPS
Serial Number(s)	4366
Sampler	Laura Gloria
Date	2022-11-28
Calibration Type?	Single Point Calibration, Turbidity Calibration

Turbidity Calibration

Lot Number	52D (<10, 100, 800), 34D (20)
Expiration Date	2023-06-01

11:14, 0, 10, yes

Pre Calibration	0
Post Calibration	10
Calibration Within Range	Yes
Time	11:14

11:15, 0, 20, yes

Pre Calibration	0
Post Calibration	20
Calibration Within Range	Yes
Time	11:15

11:15, 0, 100, yes

Pre Calibration	0
Post Calibration	100
Calibration Within Range	Yes
Time	11:15

11:15, 0, 800, yes

Pre Calibration	0
Post Calibration	800
Calibration Within Range	Yes
Time	11:15

Single Point Calibration

Lot Number	2GH670 (pH4), 2GI304 (pH7), 2GH903 (pH10), 2GI566 (COND), 2GJ570 (ORP)
Expiration Date	2023-07-01
Calibrated Parameters	pH, Conductivity, ORP

10:23

Calibration Range for pH - +/- 0.2 S.U	
Time	10:23
pH Pre Calibration	4.08
pH Post Calibration	4
pH Calibration Within Range	No

10:29

Calibration Range for pH - +/- 0.2 S.U	
Time	10:29
pH Pre Calibration	6.93
pH Post Calibration	7
pH Calibration Within Range	Yes

12:13

Calibration Range for pH - +/- 0.2 S.U	
Time	12:13
pH Pre Calibration	9.84
pH Post Calibration	10
pH Calibration Within Range	Yes

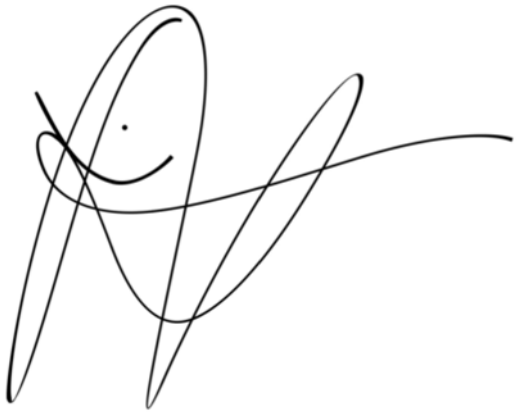
1354

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	10:40
Conductivity Pre Calibration	1354
Conductivity Post Calibration	1413
Conductivity Calibration Within Range	No

228.3

Calibration Range for ORP- +/- 25mV	
Time	10:37
ORP Pre Calibration	228.3
ORP Post Calibration	220
ORP Calibration Within Range	Yes
Notes	Calibrating for ph, conductivity, and ORP for GW sampling

Signed



Signed 2022-11-28 16:42:27 UTC

Date	2022-11-28
Checked By	Laura Gloria
Date	2022-11-28
Have you performed work in accordance with the applicable QP/TGI?	Yes

LHAAP, 2022-11-28

Created	2022-11-28 17:34:05 UTC by Daniel Luneau
Updated	2022-11-28 17:46:52 UTC by Daniel Luneau
Location	32.6834142, -94.1513822
Unique Survey ID	30001997-20221128

TAILGATE HEALTH & SAFETY MEETING FORM This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Details

Project Name	LHAAP
Project Location	Karnack, TX
Project Number	30001997
Date	2022-11-28
Time	11:34
Conducted By	Daniel Luneau

Signature

Signed 2022-11-28 17:34:41 UTC

Client and Sub-contractor details

Client Name	USACE
Sub-contractor Companies	EDC

Tracking the Tailgate Meeting

Think - through the Tasks

List the tasks for the day	Drilling activities and equipment mobilization
Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations	None

Prework Authorization (Check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins)

Prework Authorization	Not Applicable
Were pre-work stretches completed?	Yes

Pre-Work Stretches (see attached reference file) Half neck circles: gently roll head side-to-side Neck-to-shoulder: apply gentle pressure Neck flexion and extension stretch: apply gentle pressure; repeat in opposite direction Shoulder circles: perform forward and reverse circles Upper trap stretch: cross one arm behind back, gently pull and tilt head Overhead tricep stretch: gently push inverted arm at elbow; switch sides Standing shoulder stretch: gently push extended arm; switch sides Lower neck and upper back stretch: look downward while slowly raising arms and pressing shoulders forward Arms behind back stretch: clasp hands behind back and slowly raise arms Wrist movement: bend wrist right-to-left, then front-to-back Wrist circles: perform slow circular motion clockwise; then counterclockwise Hand open & close: close hands to make fists, then release Wrist flexion stretch: bend wrist downward and apply gentle pressure; switch sides Wrist extension stretch: bend wrist upward and apply gentle pressure; switch sides Straight leg kicks: kick one leg forward and touch opposite hand to opposite foot; switch sides Forward lunge with rotation: perform forward lunge, then rotate torso to the same side as lead leg; switch sides Standing at band stretch: lean opposite direction of hind leg; switch sides

Recognize the hazards (select all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - select risk level) - Provide an overall assessment of hazards to be encountered today and briefly discuss them at the bottom.

Gravity (i.e., ladder, scaffold, trips)	Low
Motion (i.e., traffic, moving water)	Medium
Motion Comment	Equipment mobilization
Mechanical (i.e., augers, motors)	Medium
Mechanical Comment	Drilling activities
Electrical (i.e., utilities, lightning)	Low
Environmental (i.e., weather, hot/cold surfaces, water bodies)	Low
Pressure (i.e. gas cylinders, wells)	Low
Chemical (i.e., fuel, acid, paint)	Low
Biological (i.e., ticks, poison ivy)	Low
Radiation (i.e., alpha, sun, laser)	Low
Sound (i.e., machinery, generators)	Medium
Sound Comment	Drilling activities
Personal Safety (i.e. alone, night, high crime area)	Low
Driving (i.e. car, ATV, boat, dozer)	Medium
Driving Comment	Equipment mobilization

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

Hazard Controls Discussed	STOP WORK AUTHORITY, Elimination, General PPE Usage, Hearing Conservation

Daniel Luneau

Name	Daniel Luneau
Company	Arcadis

Site Staff and Visitors Signature

Signed 2022-11-28 17:36:44 UTC

I have read and understand the daily H&S documents	Yes

Ivan Herrera

Name	Ivan Herrera

Site Staff and Visitors Signature

Signed 2022-11-28 17:38:45 UTC

I have read and understand the daily H&S documents	Yes

Andre Chavez

Name	Andre Chavez
Company	EDC

Site Staff and Visitors Signature

Signed 2022-11-28 17:40:00 UTC

I have read and understand the daily H&S documents	Yes

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Important Information and Numbers: 1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns. 2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager. 3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager. 4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment. I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments. If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed. I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-29 13:41:49 UTC by Laura Gloria
Updated	2022-12-13 17:28:58 UTC by Laura Gloria
Location	32.6833862671933, -94.15154683412439
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Select Project Number	30001997, US Army Corps of Engineers - Baltimore District, 02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Model	YSI 556 MPS
Serial Number(s)	4366
Sampler	Laura Gloria
Date	2022-11-29
Calibration Type?	Single Point Calibration, Turbidity Calibration

Turbidity Calibration

Lot Number	52D (<10, 100, 800), 34D (20)
Expiration Date	2023-06-01

11:14, 0, 10, yes

Pre Calibration	0
Post Calibration	10
Calibration Within Range	Yes
Time	11:14

11:15, 0, 20, yes

Pre Calibration	0
Post Calibration	20
Calibration Within Range	Yes
Time	11:15

11:15, 0, 100, yes

Pre Calibration	0
Post Calibration	100
Calibration Within Range	Yes
Time	11:15

11:15, 0, 800, yes

Pre Calibration	0
Post Calibration	800
Calibration Within Range	Yes
Time	11:15

Single Point Calibration

Lot Number	2GH670 (pH4), 2GI304 (pH7), 2GH903 (pH10), 2GI566 (COND), 2GJ570 (ORP)
Expiration Date	2023-07-01
Calibrated Parameters	pH, Conductivity, ORP

07:45

Calibration Range for pH - +/- 0.2 S.U	
Time	07:45
pH Pre Calibration	4.08
pH Post Calibration	4
pH Calibration Within Range	No

07:53

Calibration Range for pH - +/- 0.2 S.U	
Time	07:53
pH Pre Calibration	6.93
pH Post Calibration	7
pH Calibration Within Range	Yes

07:54

Calibration Range for pH - +/- 0.2 S.U	
Time	07:54
pH Pre Calibration	9.91
pH Post Calibration	10
pH Calibration Within Range	Yes

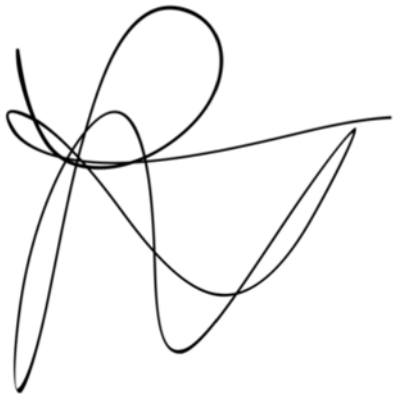
1331

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:55
Conductivity Pre Calibration	1331
Conductivity Post Calibration	1413
Conductivity Calibration Within Range	No

217.4

Calibration Range for ORP- +/- 25mV	
Time	08:01
ORP Pre Calibration	217.4
ORP Post Calibration	220
ORP Calibration Within Range	Yes
Notes	Calibrating for ph, conductivity, and ORP for GW sampling

Signed



Signed 2022-11-29 14:04:28 UTC

Date	2022-11-29
Checked By	Laura Gloria
Date	2022-11-29
Have you performed work in accordance with the applicable QP/TGI?	Yes

LHAAP , 2022-11-29

Created	2022-11-29 13:27:46 UTC by Daniel Luneau
Updated	2022-11-29 13:46:07 UTC by Daniel Luneau
Location	32.6837898, -94.1513409
Unique Survey ID	30001997-20221129

TAILGATE HEALTH & SAFETY MEETING FORM This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Details

Project Name	LHAAP
Project Location	Karnack, TX
Project Number	30001997
Date	2022-11-29
Time	07:27
Conducted By	Daniel Luneau

Signature

Signed 2022-11-29 13:28:17 UTC

Client and Sub-contractor details

Client Name	USACE
Sub-contractor Companies	EDC

Tracking the Tailgate Meeting

Think - through the Tasks

List the tasks for the day	Drilling activities and equipment mobilization
Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations	None

Prework Authorization (Check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins)

Prework Authorization	Not Applicable
Were pre-work stretches completed?	Yes

Pre-Work Stretches (see attached reference file) Half neck circles: gently roll head side-to-side Neck-to-shoulder: apply gentle pressure Neck flexion and extension stretch: apply gentle pressure; repeat in opposite direction Shoulder circles: perform forward and reverse circles Upper trap stretch: cross one arm behind back, gently pull and tilt head Overhead tricep stretch: gently push inverted arm at elbow; switch sides Standing shoulder stretch: gently push extended arm; switch sides Lower neck and upper back stretch: look downward while slowly raising arms and pressing shoulders forward Arms behind back stretch: clasp hands behind back and slowly raise arms Wrist movement: bend wrist right-to-left, then front-to-back Wrist circles: perform slow circular motion clockwise; then counterclockwise Hand open & close: close hands to make fists, then release Wrist flexion stretch: bend wrist downward and apply gentle pressure; switch sides Wrist extension stretch: bend wrist upward and apply gentle pressure; switch sides Straight leg kicks: kick one leg forward and touch opposite hand to opposite foot; switch sides Forward lunge with rotation: perform forward lunge, then rotate torso to the same side as lead leg; switch sides Standing at band stretch: lean opposite direction of hind leg; switch sides

Recognize the hazards (select all those that are discussed) (Examples are provided) and Assess the Risks (Low, Medium, High - select risk level) - Provide an overall assessment of hazards to be encountered today and briefly discuss them at the bottom.

Gravity (i.e., ladder, scaffold, trips)	Low
Motion (i.e., traffic, moving water)	Medium
Motion Comment	Equipment mobilization
Mechanical (i.e., augers, motors)	Medium
Mechanical Comment	Drilling Activities
Electrical (i.e., utilities, lightning)	Low
Environmental (i.e., weather, hot/cold surfaces, water bodies)	Low
Pressure (i.e. gas cylinders, wells)	Low
Chemical (i.e., fuel, acid, paint)	Low
Biological (i.e., ticks, poison ivy)	Medium
Biological Comment	Ticks
Radiation (i.e., alpha, sun, laser)	Low
Sound (i.e., machinery, generators)	Medium
Sound Comment	Drilling activities
Personal Safety (i.e. alone, night, high crime area)	Low
Driving (i.e. car, ATV, boat, dozer)	Medium
Driving Comment	Equipment mobilization

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

Hazard Controls Discussed	STOP WORK AUTHORITY, General PPE Usage, Hearing Conservation

Daniel Luneau

Name	Daniel Luneau
Company	Arcadis

Site Staff and Visitors Signature	
	Signed 2022-11-29 13:30:39 UTC
I have read and understand the daily H&S documents	Yes

Ivan Herrera

Name	Ivan Herrera
Company	EDS
Site Staff and Visitors Signature	
	Signed 2022-11-29 13:32:34 UTC
I have read and understand the daily H&S documents	Yes

Andre Chavez

Name	Andre Chavez
Company	EDS
Site Staff and Visitors Signature	
	Signed 2022-11-29 13:31:54 UTC
I have read and understand the daily H&S documents	Yes

Post Daily Activities Review - Review at end of day or before next day's work

Please describe any lessons learned, best practices learned, incidents that may have occurred, any stop work interventions, corrective/preventative actions needed and other H&S issues below.

Important Information and Numbers: 1. All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns. 2. In the event of an injury, employees will call WorkCare at 1.888-449-7787 and then notify the field supervisor who will then notify the Project or Task Manager. 3. In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager. 4. In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment. I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments. If it is necessary to STOP THE JOB, I will perform TRACK; and then amend the hazard assessments or the HASP as needed. I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

30001997, LHAAP-CSA-GW-01-112922, 2022-11-29, USACE, LHAAP

Created	2022-11-29 20:42:03 UTC by Daniel Luneau
Updated	2022-11-29 20:46:25 UTC by Daniel Luneau
Location	32.6825936, -94.150971
Status	In Progress
Note: This app is for sampling that is completed using a pump or bailer and not hydrasleeve or PDB	
Note: Please make sure to sync frequently throughout your work day when possible.	
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	
Project Number	30001997
Client	USACE
Project Name / Location	LHAAP
Well ID	LHAAP-CSA-GW-01-112922
Date	2022-11-29
Time In	12:00
Sampler Name	Daniel Luneau
Are you connected to the internet via data plan or WiFi?	Yes
Click here to get weather data from National Weather Service (NWS) for your current location. It may take a few seconds to retrieve and populate the data from NWS.	N/A
Note: You have selected to bring in weather data from NWS. Please review and/or confirm the weather data prior to submitting (ensure wind speed, temperature, etc. is of reasonable value and in the units required by project).	
Weather Calculation	NA
Is well able to be sampled?	Yes

Evacuation Details

Is Well Head PID Reading required?	No
Measuring Point (mp) Description	Top of Inner Casing
Casing Diameter (inches)	1
Well Casing Material	PVC
Static Water Level (ft-bmp)	19.73
Total Depth (ft-bmp)	25
Water Column	5.27
Gallons in Well	0.21
Reference Note: Well Volume Calculation [$\pi r^2 h$, where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 1 cubic inch = 0.004329 gallons 0.5" diameter = 0.01 gal/ft = 37.85 mL/ft 1" diameter = 0.04 gal/ft = 151.4 mL/ft 2" diameter = 0.16 gal/ft = 605.66 mL/ft 3" diameter = 0.37 gal/ft = 1400.6 mL/ft 4" diameter = 0.65 gal/ft = 2460 mL/ft	
Purge Method	Volumetric
Purge Equipment	Bailer
Sample Depth (ft-bmp) (e.g. pump intake)	25
Water Quality Meter Make/Model	none
Are you using the Groundwater Sampling TGI to stabilize parameters?	Yes

@13:00, DTW:19.73, pH:6.77, temp:21.85, cond:2.191, turb:, DO:4.51, redox:-113.9

Well-ClientName	LHAAP-CSA-GW-01-112922LHAAP
Reading Time	13:00
Minutes Elapsed between readings	0
Total Elapsed Minutes (during parameter readings)	0
Total Elapsed Minutes from Purge Start Time	0
Purge Rate measured in:	mL/min
Rate (mL/min)	180
Depth to Water (ft)	19.73
Theoretical Total Volume Purged	0 milliliters purged
pH	6.77
Conductivity (mS/cm)	2.191
Is the turbidity reading outside the range of the meter?	Yes
Dissolved Oxygen (mg/L)	4.51
Temperature (Degrees Celsius)	21.85
Redox (ORP mV)	-113.9
parameters	@13:00, DTW:19.73, pH:6.77, temp:21.85, cond:2.191, turb:, DO:4.51, redox:-113.9
Are you collecting an additional groundwater parameter not listed above?	No

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

Sample Information

Did the well go dry during purging?	No
Sample ID	LHAAP-CSA-GW-01-112922
Sample Time	12:00
Sample Date	2022-11-29
Sample Equipment	Bailer
Sample Type	Grab
Color	Brown
Replicate ID (e.g. Dup)	FD-5-112922
Time Out	13:15

Well Information

Photo of Well	
Have you performed work in accordance with the applicable QP/TGI?	Yes
Unique Sample ID	30001997-LHAAP-CSA-GW-01-112922-20221129

30001997, LHAAP-HWSA-GW-01 , 2022-11-29, USACE, LHAAP

Created	2022-11-29 20:20:44 UTC by Daniel Luneau
Updated	2022-11-29 20:28:14 UTC by Daniel Luneau
Location	32.6826166, -94.1515364
Status	In Progress
Note: This app is for sampling that is completed using a pump or bailer and not hydrasleeve or PDB	
Note: Please make sure to sync frequently throughout your work day when possible.	
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	
Project Number	30001997
Client	USACE
Project Name / Location	LHAAP
Well ID	LHAAP-HWSA-GW-01
Date	2022-11-29
Time In	09:30
Sampler Name	Daniel Luneau
Are you connected to the internet via data plan or WiFi?	Yes
Click here to get weather data from National Weather Service (NWS) for your current location. It may take a few seconds to retrieve and populate the data from NWS.	N/A
Note: You have selected to bring in weather data from NWS. Please review and/or confirm the weather data prior to submitting (ensure wind speed, temperature, etc. is of reasonable value and in the units required by project).	
Weather Calculation	NA
Is well able to be sampled?	Yes

Evacuation Details

Is Well Head PID Reading required?	No
Measuring Point (mp) Description	Top of Inner Casing
Casing Diameter (inches)	1
Well Casing Material	PVC
Static Water Level (ft-bmp)	28.22
Total Depth (ft-bmp)	29.56
Water Column	1.3399999999999999
Gallons in Well	0.05
Reference Note: Well Volume Calculation [$\pi r^2 h$, where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 1 cubic inch = 0.004329 gallons 0.5" diameter = 0.01 gal/ft = 37.85 mL/ft 1" diameter = 0.04 gal/ft = 151.4 mL/ft 2" diameter = 0.16 gal/ft = 605.66 mL/ft 3" diameter = 0.37 gal/ft = 1400.6 mL/ft 4" diameter = 0.65 gal/ft = 2460 mL/ft	
Purge Method	No-Purge
Purge Equipment	Bailer
Water Quality Meter Make/Model	none
Are you using the Groundwater Sampling TGI to stabilize parameters?	Yes

@09:30, DTW:28.22, pH:, temp:, cond:, turb:, DO:, redox:

Well-ClientName	LHAAP-HWSA-GW-01 LHAAP
Reading Time	09:30
Minutes Elapsed between readings	0
Total Elapsed Minutes (during parameter readings)	0
Total Elapsed Minutes from Purge Start Time	0
Purge Rate measured in:	mL/min
Rate (mL/min)	180
Depth to Water (ft)	28.22
Theoretical Total Volume Purged	0 milliliters purged
Is the turbidity reading outside the range of the meter?	No
parameters	@09:30, DTW:28.22, pH:, temp:, cond:, turb:, DO:, redox:
Are you collecting an additional groundwater parameter not listed above?	No
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	
Sample Start Time	09:30

Sample Information

Did the well go dry during purging?	No
Sample ID	LHAAP-HWSA-GW-01-112922
Sample Time	09:30
Sample Date	2022-11-29
Sample Equipment	Bailer
Sample Type	Grab
Color	Brown
Replicate ID (e.g. Dup)	LHAAP-FD-04-112922
Time Out	21:30

Well Information

Photo of Well	
Comments	Well purged dry. Enough water existed to sample. No parameters were taken
Have you performed work in accordance with the applicable QP/TGI?	Yes
Unique Sample ID	30001997-LHAAP-HWSA-GW-01-112922-20221129

LHAAP-HWSA-SO-01-112922, LHAAP , 2022-11-29

Created	2022-11-29 14:39:26 UTC by Daniel Luneau
Updated	2022-11-29 14:42:15 UTC by Daniel Luneau
Location	32.6644104, -94.1496894
Project Number	30001997.40013
Project Site	LHAAP
Project Location	Karnack, TX
Sample Location	LHAAP-HWSA-SO-01
Sample Date	2022-11-29
Field Personnel	Daniel Luneau
Weather	70°F, cloudy
Sampling Event	Drilling activities

Analytical Sampling

Sampling Method	Hand Auger
Sample Type	Grab
Sub-Samples	pH, TOC, grain size
Sample ID	LHAAP-HWSA-SO-01-112922
Sample Time	08:20

Sample Information

PFAS

Analyses	PFAS
Sample Container	125ml HDPE
Number of Containers	1
Preservative*	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

Physical Description

Start Depth (ft)	0
End Depth (ft)	2
Primary Component	Clay
Primary Modifier	with
Secondary Component	Silt
Secondary Modifier	trace
Tertiary Component	Fine sand
Field Moisture	Moist
Sample Color	Tan and reddish brown

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By	Daniel Luneau

Photos

30001997, LHAAP-ONFS-GW-01, 2022-11-28, USACE, LHAAP

Created	2022-11-29 19:58:05 UTC by Daniel Luneau
Updated	2022-11-29 20:14:59 UTC by Daniel Luneau
Location	32.6835689, -94.1515893
Status	In Progress
Note: This app is for sampling that is completed using a pump or bailer and not hydrasleeve or PDB	
Note: Please make sure to sync frequently throughout your work day when possible.	
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	
Project Number	30001997
Client	USACE
Project Name / Location	LHAAP
Well ID	LHAAP-ONFS-GW-01
Date	2022-11-28
Time In	13:58
Sampler Name	Daniel Luneau
Are you connected to the internet via data plan or WiFi?	Yes
Click here to get weather data from National Weather Service (NWS) for your current location. It may take a few seconds to retrieve and populate the data from NWS.	N/A
Note: You have selected to bring in weather data from NWS. Please review and/or confirm the weather data prior to submitting (ensure wind speed, temperature, etc. is of reasonable value and in the units required by project).	
Weather Calculation	NA
Is well able to be sampled?	Yes

Evacuation Details

Is Well Head PID Reading required?	No
Measuring Point (mp) Description	Top of Inner Casing
Casing Diameter (inches)	1
Well Casing Material	PVC
Static Water Level (ft-bmp)	5.06
Total Depth (ft-bmp)	6.88
Water Column	1.8200000000000005
Gallons in Well	0.07
Reference Note: Well Volume Calculation [$\pi r^2 h$, where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 1 cubic inch = 0.004329 gallons 0.5" diameter = 0.01 gal/ft = 37.85 mL/ft 1" diameter = 0.04 gal/ft = 151.4 mL/ft 2" diameter = 0.16 gal/ft = 605.66 mL/ft 3" diameter = 0.37 gal/ft = 1400.6 mL/ft 4" diameter = 0.65 gal/ft = 2460 mL/ft	
Purge Method	No-Purge
Purge Equipment	Bailer
Sample Depth (ft-bmp) (e.g. pump intake)	6.88
Water Quality Meter Make/Model	none
Serial Number of Water Quality Meter	Nrm7849j: meter xklb8wuw : probes

Are you using the Groundwater Sampling TGI to stabilize parameters?	Yes

@14:14, DTW:5.06, pH:, temp:, cond:, turb:, DO:, redox:

Well-ClientName	LHAAP-ONFS-GW-01LHAAP
Reading Time	14:14
Minutes Elapsed between readings	0
Total Elapsed Minutes (during parameter readings)	0
Total Elapsed Minutes from Purge Start Time	0
Purge Rate measured in:	mL/min
Rate (mL/min)	180
Depth to Water (ft)	5.06
Theoretical Total Volume Purged	0 milliliters purged
Is the turbidity reading outside the range of the meter?	No
parameters	@14:14, DTW:5.06, pH:, temp:, cond:, turb:, DO:, redox:
Are you collecting an additional groundwater parameter not listed above?	No
Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit	
Sample Start Time	15:40

Sample Information

Did the well go dry during purging?	Yes
Sample ID	LHAAP-ONFS-GW-01-112922
Sample Time	15:40
Sample Date	2022-11-29
Sample Equipment	Bailer
Sample Type	Grab
Color	Brown
Time Out	15:50

Well Information

Is the well damaged?	No

Photo of Well

Comments	No field parameters taken because the well was bailed dry.
Have you performed work in accordance with the applicable QP/TGI?	Yes
Unique Sample ID	30001997-LHAAP-ONFS-GW-01-112922-20221128

30001997, LHAAP-ONFS-GW-04, 2022-11-28, USACE, LHAAP

Created	2022-11-29 20:15:01 UTC by Daniel Luneau
Updated	2022-11-29 20:20:42 UTC by Daniel Luneau
Location	32.6825834, -94.1516154
Status	In Progress
Note: This app is for sampling that is completed using a pump or bailer and not hydrasleeve or PDB	
Note: Please make sure to sync frequently throughout your work day when possible.	
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes
Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.	
Project Number	30001997
Client	USACE
Project Name / Location	LHAAP
Well ID	LHAAP-ONFS-GW-04
Date	2022-11-28
Time In	16:05
Sampler Name	Daniel Luneau
Are you connected to the internet via data plan or WiFi?	Yes
Click here to get weather data from National Weather Service (NWS) for your current location. It may take a few seconds to retrieve and populate the data from NWS.	N/A
Note: You have selected to bring in weather data from NWS. Please review and/or confirm the weather data prior to submitting (ensure wind speed, temperature, etc. is of reasonable value and in the units required by project).	
Weather Calculation	NA
Is well able to be sampled?	Yes

Evacuation Details

Is Well Head PID Reading required?	No
Measuring Point (mp) Description	Top of Inner Casing
Casing Diameter (inches)	1
Well Casing Material	PVC
Static Water Level (ft-bmp)	37.3
Total Depth (ft-bmp)	43.94
Water Column	6.640000000000001
Gallons in Well	0.27
Reference Note: Well Volume Calculation [$\pi r^2 h$, where h= 1foot] Well radius (inch):Volume (Gal./foot):Volume (mL/foot) 1 cubic inch = 0.004329 gallons 0.5" diameter = 0.01 gal/ft = 37.85 mL/ft 1" diameter = 0.04 gal/ft = 151.4 mL/ft 2" diameter = 0.16 gal/ft = 605.66 mL/ft 3" diameter = 0.37 gal/ft = 1400.6 mL/ft 4" diameter = 0.65 gal/ft = 2460 mL/ft	
Purge Method	No-Purge
Purge Equipment	Bailer
Sample Depth (ft-bmp) (e.g. pump intake)	43
Water Quality Meter Make/Model	none
Are you using the Groundwater Sampling TGI to stabilize parameters?	Yes

@16:05, DTW:37.3, pH:7.11, temp:20.9, cond:2.755, turb:, DO:2.65, redox:-101.3

Well-ClientName	LHAAP-ONFS-GW-04LHAAP
Reading Time	16:05
Minutes Elapsed between readings	0
Total Elapsed Minutes (during parameter readings)	0
Total Elapsed Minutes from Purge Start Time	0
Purge Rate measured in:	mL/min
Rate (mL/min)	180
Depth to Water (ft)	37.30
Theoretical Total Volume Purged	0 milliliters purged
pH	7.11
Conductivity (mS/cm)	2.755
Is the turbidity reading outside the range of the meter?	Yes
Dissolved Oxygen (mg/L)	2.65
Temperature (Degrees Celsius)	20.9
Redox (ORP mV)	-101.3
parameters	@16:05, DTW:37.3, pH:7.11, temp:20.9, cond:2.755, turb:, DO:2.65, redox:-101.3
Are you collecting an additional groundwater parameter not listed above?	No
Stabilization Criteria	Continue purging, the parameters are not stable. pH: not stable cond: not stable turb: undefined DO: not stable temp: not stable ORP: not stable time elapsed: 1440

Well is considered stabilized and ready for sample collection when the following is met for three consecutive readings collected at 3 to 5 minute intervals: -turbidity remains within 10% (or within 1 NTU if turbidity is <10NTU) -specific conductance and temp remain within 3% -ORP within + or - 10 mV -DO within 10% -pH within 0.1 unit

Sample Information

Did the well go dry during purging?	No
Sample ID	LHAAP-ONFS-GW-04-112822
Sample Time	16:05
Sample Date	2022-11-29
Sample Equipment	Bailer
Sample Type	Grab
Color	Brown
Time Out	16:10
Have you performed work in accordance with the applicable QP/TGI?	Yes
Unique Sample ID	30001997-LHAAP-ONFS-GW-04-112822-20221128

02118231.3006-Balt HTRW AE PFAS ADDL PAs

Created	2022-11-29 13:41:49 UTC by Laura Gloria
Updated	2022-12-13 17:28:58 UTC by Laura Gloria
Location	32.6833862671933, -94.15154683412439
Have you read the Quality Procedure (QP) and/or Technical Guidance Instruction (TGI) relevant to this use case?	Yes

Selecting "Yes" confirms your digital signature as having read the QP and/or TGI relevant to this use case.

NOTE: For general use only. State specific or regulatory requirements for calibration are not included in this form. Please refer to Site project team for specific requirements.

This app is best used to calibrate equipment with auto-cal solutions or turbidity only solutions. Use of this app for three point calibrations is not advised.

Project Details

Select Project Number	30001997, US Army Corps of Engineers - Baltimore District, 02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Name	02118231.3006-Balt HTRW AE PFAS ADDL PAs
Project Number	30001997
Client	US Army Corps of Engineers - Baltimore District
Model	YSI 556 MPS
Serial Number(s)	4366
Sampler	Laura Gloria
Date	2022-11-29
Calibration Type?	Single Point Calibration, Turbidity Calibration

Turbidity Calibration

Lot Number	52D (<10, 100, 800), 34D (20)
Expiration Date	2023-06-01

11:14, 0, 10, yes

Pre Calibration	0
Post Calibration	10
Calibration Within Range	Yes
Time	11:14

11:15, 0, 20, yes

Pre Calibration	0
Post Calibration	20
Calibration Within Range	Yes
Time	11:15

11:15, 0, 100, yes

Pre Calibration	0
Post Calibration	100
Calibration Within Range	Yes
Time	11:15

11:15, 0, 800, yes

Pre Calibration	0
Post Calibration	800
Calibration Within Range	Yes
Time	11:15

Single Point Calibration

Lot Number	2GH670 (pH4), 2GI304 (pH7), 2GH903 (pH10), 2GI566 (COND), 2GJ570 (ORP)
Expiration Date	2023-07-01
Calibrated Parameters	pH, Conductivity, ORP

07:45

Calibration Range for pH - +/- 0.2 S.U	
Time	07:45
pH Pre Calibration	4.08
pH Post Calibration	4
pH Calibration Within Range	No

07:53

Calibration Range for pH - +/- 0.2 S.U	
Time	07:53
pH Pre Calibration	6.93
pH Post Calibration	7
pH Calibration Within Range	Yes

07:54

Calibration Range for pH - +/- 0.2 S.U	
Time	07:54
pH Pre Calibration	9.91
pH Post Calibration	10
pH Calibration Within Range	Yes

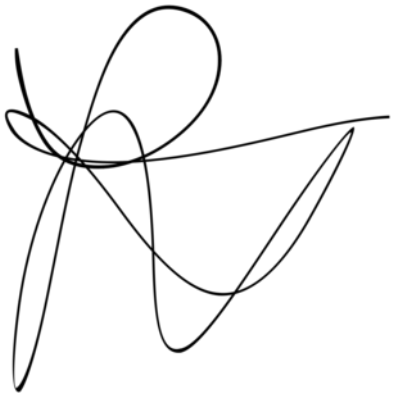
1331

Calibration Range for Conductivity - +/- 1% of the calibration standard	
Time	07:55
Conductivity Pre Calibration	1331
Conductivity Post Calibration	1413
Conductivity Calibration Within Range	No

217.4

Calibration Range for ORP- +/- 25mV	
Time	08:01
ORP Pre Calibration	217.4
ORP Post Calibration	220
ORP Calibration Within Range	Yes
Notes	Calibrating for ph, conductivity, and ORP for GW sampling

Signed



Signed 2022-11-29 14:04:28 UTC

Date	2022-11-29
Checked By	Laura Gloria
Date	2022-11-29
Have you performed work in accordance with the applicable QP/TGI?	Yes

01189505

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Number 139203

Arcadis / USACE

Client: Zeugor Dr.	Report to Contact: Dana Schmidt	Telephone No. / E-mail: Dana.Schmidt@Arcadis	Quote No.
Address: Karnack TX 75661	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page ___ of ___
City: LHAAP PFAS	State / Zip Code	Printed Name: Daniel Luneau	Lot # Bar Code (lab use only)
Project Name: 30001997			
Project No.	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	TCLP Voc	TCLP	Ignitability, pH	Reactives	PFAS	TOC, pH, grain size	Remarks / Cooler I.D.
LHAAP-IOW-SO-113022	11/30/22	1430	C		X									X	X	X	X	X		
LHAAP-IOW-W-113022	11/30/22	1500	C	X										X	X	X	X	X		
LHAAP-ONFS-GW-01-112822	11-28-22	15:46	X															X		
LHAAP-ONFS-GW-04-112822	11-28-22	16:05	X															X		
LHAAP-HWSA-SC-01-112922	11-29-22	08:20	X																X	
LHAAP-HWSA-GW-01-112922	11-29-22	09:30	X															X		MS/MSD

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	11/30/22	1510	1. Received by		
2. Relinquished by	11-30-22	1510	2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by		

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ___ °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

01189506

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Number 139210

Client: USACE	Report to Contact	Telephone No. / E-mail: (607)-346-1272 dana.schmidt@arcadis.com	Quote No.
Address: 29 Zeugner	Sampler's Signature: X Laura Gloria	Analysis (Attach list if more space is needed)	Page ____ of ____
City: Karnack / State: TX / Zip Code: 75661	Printed Name: Laura Gloria		Lot # Bar Code (lab use only)
Project Name: LHAAP			
Project No.: 30001997	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab G / Composite C	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS QSM	Remarks / Cooler I.D.
LHAAP-40WW02-113022	11-30-22	09:45	G	X			X							X	
LHAAP-47WW19-113022	11-30-22	12:55													
LHAAP-47WW42-113022	11-30-22	11:30													MS/MSD
LHAAP-FD-2-GW-113022	11-30-22	—													
LHAAP-FD-3-GW-112922	11-29-22	—													
LHAAP-FD-4-GW-112922	11-29-22	—													
LHAAP-FB-1-GW-112822	11-28-22	14:50													
LHAAP-FB-2-GW-112822	11-28-22	16:35													
LHAAP-FB-3-GW-112922	11-29-22	09:45													
LHAAP-FB-4-GW-113022	11-30-22	11:20	▼	▼			▼							▼	

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Laura Gloria	11-30-22	1510	1. Received by		
2. Relinquished by:	11-30-22	1510	2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by		

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. _____ °C

Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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Number 139204

Client	Report to Contact	Telephone No. / E-mail	Quote No.
USACE		601-346-1272 Dana.Schmidt@arcadis.com	
Address	**Sampler's Signature**	**Analysis (Attach list if more space is needed)**	Page ____ of ____
2eugner Dr.	x Laura Gicrici		
City / **State** / **Zip Code**	**Printed Name**		**Lot # Bar Code (lab use only)**
Karnack / TX / 75661	Laura Gicrici		
Project Name			
LHAAP			
Project No.	**P.O. No.**		
30001997			

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS QSM	Remarks / Cooler I.D.
LHAAP-LHSMW23R-112827	11-28-22	14:45	G	X			X							X	
LHAAP-LHSMW25-112822	11-28-22	16:30													
LHAAP-46WW06-112822	11-28-22	12:50													
LHAAP-47WW48-112922	11-29-22	14:00													
LHAAP-35BWW07-112922	11-29-22	09:20													MS/MSD
LHAAP-LHSMW44-112922	11-29-22	14:20													
LHAAP-LHSMW41-112922	11-29-22	10:45													
LHAAP-LHSMW54-112922	11-29-22	16:15													MS/MSD
LHAAP-LHSMW56R-112922	11-29-22	15:40													
LHAAP-LHSMW45-113022	11-30-22	12:40													

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☒ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Laura Gicrici	11-30-22		1. Received by		
2. Relinquished by	11-30-22	1510	2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by		

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack

Receipt Temp. _____ °C

Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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Number 139206

Client USACE	**Report to Contact**	**Telephone No. / E-mail** 607-346-1272 Dana.Schmidt@arcadis.com	**Quote No.**
Address Zeugner	**Sampler's Signature** X Laura Gloria	**Analysis (Attach list if more space is needed)**	**Page** ____ **of** ____
City Karnack **State** TX **Zip Code** 75661	**Printed Name** Laura Gloria		**Lot # Bar Code** (lab use only)
Project Name LHAAP			
Project No. 30061997	**P.O. No.**		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS QSM	Remarks / Cooler I.D.
LHAAP-FB-S-GW-113022		12:55	G	X			X							X	
LHAAP-VWR-DEB-8-113022	11-30-22	08:50	C	X			|							|	
LHAAP-AWIP-DEB-9-113022	11-30-22	09:30	C	X			|							|	
LHAAP-PA3-SO-04-112822	11-28-22	15:25	G		X		|							|	
LHAAP-FD-2-SO-112822	11-28-22	—	G		X		|							|	
LHAAP-FD-5-GW-112922	11-29-22	—	G	X			X							X	
LHAAP-FD-6-GW-112922	11-29-22	—	G	X			X							X	
LHAAP-SB-01-112922	11-29-22	14:50	G	X			X							X	
LHAAP-EB-06-112922	11-29-22	16:10	G	X			X							X	
LHAAP-CSA-GW-01-112922	11-29-22	12:00	G	X			X							X	MS/MSD

Turn Around Time Required (Prior lab approval required for expedited TAT.) X **Standard** ☐ **Rush** (Specify)

Sample Disposal ☐ Return to Client X Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison X Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by Laura Gloria	11-30-22	1515	1. Received by		
2. Relinquished by	11-30-22	1515	2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by		

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. _____ °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

01189509

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	16WW38			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	27.85	**Total Depth (ft-bmp)**	32.25	**Water Column (ft)**	4.40	**Gallons in Well**	2.86
Purge Start	13:39	**Pump Intake (ft-bmp)**	27.25	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:15	**Volumes Purged**		**Sample ID**	LHAAP-16WW38-111722	**Sampled by**	Andrew Parker
Sample Time	14:10	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:44	0	0	100	27.63	0.13	6.95	1.895	221	11.17	19.05	-103.2	Clear	
13:47	3	3	100	27.80	0.21	6.96	2.119	220	8.62	19.23	-100.24	Clear	
13:50	3	6	100	27.80	0.29	7.02	2.113		8.46	19.34	-100.4	Clear	
13:53	3	9	100	27.85	0.37	7.02	2	136	9.62	19.48	-97.3	Clear	
13:56	3	12	100	27.85	0.45	7.03	1.994	126	9.73	19.47	-94.5	Clear	
13:59	3	15	100	27.92	0.53	7.09	2.117	103	8.13	19.66	-88	Clear	
14:02	3	18	100	27.92	0.61	6.99	2.187		8.9	19.88	-80.3	Clear	
14:05	3	21	100	27.95	0.69	6.98	2.161	74.1	9.04	19.98	-75.7	Clear	

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing already

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: 16WW38
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189510

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	18CPTMW04			**Date**	11/16/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	24.80	**Total Depth (ft-bmp)**	37.25	**Water Column (ft)**	12.45	**Gallons in Well**	8.09
Purge Start	14:50	**Pump Intake (ft-bmp)**	32.25	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-18CPTMW04-111622	**Sampled by**	Andrew Parker
Sample Time	15:30	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:57	0	0	100	24.76	0.08	6.25	1.418	0	7.03	19.86	148.3		
15:00	3	3	100	24.76	0.08	6.25	1.415	0	8.15	19.96	135.1		
15:03	3	6	100	24.85	0.32	6.33	1.407	0	7.49	19.7	125.2		
15:06	3	9	100	24.85	0.40	6.28	1.404	0	8.34	19.74	120.9		
15:09	3	12	100	24.84	0.48	6.26	1.413	0	8.36	19.81	116.2		
15:12	3	15	100	24.84	0.55	6.25	1.433	0	2.1	19.83	112.2		
15:15	3	18	100	24.82	0.63	6.26	1.467	0	3.75	19.92	107.7		
15:18	3	21	100	24.82	0.71	6.22	1.482	0	1.47	19.9	106.4		
15:21	3	24	100	24.82	0.79	6.2	1.52	0	0.91	19.79	105		

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Center of burn pit area
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189511

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	46WW06			**Date**	11/30/2022
Project Name/Location	LHAAP		**Weather(°F)**	38 °F, , winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	38.89	**Total Depth (ft-bmp)**	47.68	**Water Column (ft)**	8.79	**Gallons in Well**	5.71
Purge Start	09:15	**Pump Intake (ft-bmp)**	42.68	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:00	**Volumes Purged**		**Sample ID**	LHAAP-46WW02-113022	**Sampled by**	Andrew Parker
Sample Time	09:45	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:19	0	0	200	39.82	0.00	5.02	0.658	12.9	4.99	15.59	79.3		
09:24	5	5	200	39.87	0.00	5.06	0.664		1.32	16.29	65.5		
09:27	3	8	200	39.87	0.00	5.1	0.665	6.44	0.8	16.67	65.1		
09:30	3	11	200	39.90	0.00	5.06	0.667	7.1	0.35	16.8	65		
09:33	3	14	200	39.90	0.00	5.1	0.665	5.12	1.14	16.83	64.9		
09:36	3	17	200	39.90	0.00	5.03	0.661	5.12	0.33	16.91	68.1		
09:39	3	20	200	39.90	0.00	5.01	0.658	3.12	0.26	16.91	70.8		
09:42	3	23	200	39.89	0.00	4.99	0.656	2.28	0.23	16.93	73.4		

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: PA2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189512

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Groundwater Sampling Form

Project Number	30001997	**Well ID**	46WW09			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	40.06	**Total Depth (ft-bmp)**	42.19	**Water Column (ft)**	2.13	**Gallons in Well**	1.38
Purge Start		**Pump Intake (ft-bmp)**		**Purge Method**	Volumetric	**Purge Equipment**	Peristaltic
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-46WW09-111722	**Sampled by**	Daniel Luneau
Sample Time	15:00	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	180		0.00	6.59	4.434		6.71	16.63	84.1	Grayish Brown	

Comments: Well was bailed practically dry. Waited approximately 15 minutes and sampled. Well had existing bladder pump tubing installed.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189513

Groundwater Sampling Form

Project Number	30001997	**Well ID**	47WW04			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	19.89	**Total Depth (ft-bmp)**	21.97	**Water Column (ft)**	2.08	**Gallons in Well**	1.35
Purge Start	12:05	**Pump Intake (ft-bmp)**	19	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:35	**Volumes Purged**		**Sample ID**	LHAAP-47WW04-111722	**Sampled by**	Daniel Luneau
Sample Time	12:30	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:09	0	0	180	19.89	0.00	6.61	5.44	261	1.12	18.64	107	Clear	
12:13	3	3	180	19.89	0.00	6.66	5.44	184	0.57	18.52	115	Clear	
12:17	2	7	180	19.89	0.00	6.68	5.44	146	0.3	18.56	117	Clear	
12:21	1	11	180	19.89	0.00	6.69	5.44	98.4	0.19	18.58	124	Clear	
12:25	4	16	180	19.89	0.00	6.7	5.45	82.1	0.19	18.55	127	Clear	

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: Stick-up

Well Locked at Arrival: no

Well Locked at Departure: no

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

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Groundwater Sampling Form

Project Number	30001997	**Well ID**	47WW19			**Date**	11/30/2022
Project Name/Location	LHAAP		**Weather(°F)**	38 °F, , winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	24.87	**Total Depth (ft-bmp)**	64.4	**Water Column (ft)**	39.53	**Gallons in Well**	25.69
Purge Start	12:20	**Pump Intake (ft-bmp)**	59.4	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:59	**Volumes Purged**		**Sample ID**	LHAAP-47WW19-113022	**Sampled by**	Andrew Parker
Sample Time	12:45	**Gallons Purged**		**Replicate/ Code No.**	LHAAP-FB-5-GW-113022	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:27	0	0	200	24.88	0.00	6.05	2.373		4.38	16.83	58.2	Rusty	
12:31	4	4	200	24.88	0.00	6.05	2.395	690	0.39	17.03	48	Rusty	
12:34	3	7	200	24.87	0.00	5.99	2.398	217	0.28	17.02	43.5	Rusty	
12:37	3	10	200	24.87	0.00	5.99	2.402		0.15	16.92	39.6	Rusty	
12:40	3	13	200	24.87	0.00	6	2.403	99	0.11	16.88	36.7	Rusty	
12:43	3	16	200	24.87	0.00	6	2.404	8.37	0.1	16.88	34.7	Rusty	
12:46	3	19	200	24.87	0.00	6.01	2.407	69.7	0.11	16.99	31.9	Rusty	
12:49	3	22	200	24.87	0.00	6.02	2.408	66.5	0.09	17.05	29.3	Rusty	

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	4	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: PA3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

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ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	47WW42			**Date**	11/30/2022
Project Name/Location	LHAAP		**Weather(°F)**	38 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.56	**Total Depth (ft-bmp)**	43.5	**Water Column (ft)**	21.94	**Gallons in Well**	14.26
Purge Start	10:50	**Pump Intake (ft-bmp)**	38.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	11:45	**Volumes Purged**		**Sample ID**	LHAAP-47WW42-113022	**Sampled by**	Andrew Parker
Sample Time	11:30	**Gallons Purged**		**Replicate/ Code No.**	LHAAP-FD-2-GW-113022; LHAAP-FB-4-GW-113022	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:57	0	0	200	22.42	0.00	6.32	0.797	24.8	5.1	18.83	62.4	Clear	None
11:00	3	3	200	22.42	0.00	6.54	0.808	9.91	0.62	19.48	47.9	Clear	None
11:04	4	7	200	23.53	0.00	6.69	0.811		0.17	19.93	43.6	Clear	None
11:08	4	11	200	23.53	0.00	6.65	0.795	1.02	0.18	20.25	44.6	Clear	None
11:11	3	14	200	21.55	0.00	6.71	0.782		0.16	20.3	46	Clear	None
11:14	3	17	200	21.55	0.00	6.63	0.771	1.9	0.14	20.31	47.7	Clear	None
11:17	3	20	200	21.56	0.00	6.66	0.763		0.12	20.36	48.3	Clear	None
11:20	3	23	200	21.56	0.00	6.65	0.755	0.64	0.11	20.36	49.1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	10	None

Comments: MS/MSD, FB

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: PA3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189516

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	47WW48			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, Cold, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	32.24	**Total Depth (ft-bmp)**	36.06	**Water Column (ft)**	3.82	**Gallons in Well**	2.48
Purge Start	16:19	**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-47WW48-111722	**Sampled by**	Andrew Parker
Sample Time	16:38	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:22	0	0	100		0.08	8.38	0.015		10.71	12.94	-46.1		
16:30	8	8	100	31.99	0.29	8.27	0.935		9.99	13.95	-44.2		
16:33	3	11	100	31.99	0.37	8.44	1.761		9.81	14.28	-43.3		

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Restarting 11/29

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: 47WW48
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189517

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHAAP-CSA-GW-01-112922			**Date**	11/29/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.73	**Total Depth (ft-bmp)**	25	**Water Column (ft)**	5.27	**Gallons in Well**	0.21
Purge Start		**Pump Intake (ft-bmp)**	25	**Purge Method**	Volumetric	**Purge Equipment**	Bailer
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-CSA-GW-01-112922	**Sampled by**	Daniel Luneau
Sample Time	12:00	**Gallons Purged**		**Replicate/ Code No.**	FD-5-112922	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:00	0	0	180	19.73	0.00	6.77	2.191		4.51	21.85	-113.9	Brown	

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: _____ Well Locked at Arrival: _____

Condition of Well: _____ Well Locked at Departure: _____

Well Completion: _____ Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189518

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHAAP-HWSA-GW-01			**Date**	11/29/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	28.22	**Total Depth (ft-bmp)**	29.56	**Water Column (ft)**	1.34	**Gallons in Well**	0.05
Purge Start		**Pump Intake (ft-bmp)**		**Purge Method**	No-Purge	**Purge Equipment**	Bailer
Purge End	NA	**Volumes Purged**	NA	**Sample ID**	LHAAP-HWSA-GW-01-112922	**Sampled by**	Daniel Luneau
Sample Time	09:30	**Gallons Purged**		**Replicate/ Code No.**	LHAAP-FD-04-112922	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:30	0	0	180	28.22	0.00							Brown	

Comments: Well purged dry. Enough water existed to sample. No parameters were taken

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: _____ Well Locked at Arrival: _____

Condition of Well: _____ Well Locked at Departure: _____

Well Completion: _____ Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189519

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHAAP-MW-21			**Date**	11/16/2022
Project Name/Location	LHAAP		**Weather(°F)**	47 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	29.65	**Total Depth (ft-bmp)**	46.68	**Water Column (ft)**	17.03	**Gallons in Well**	11.07
Purge Start	09:45	**Pump Intake (ft-bmp)**	41.68	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:30	**Volumes Purged**		**Sample ID**	LHAAP-MW-21-111722	**Sampled by**	Andrew Parker
Sample Time	10:25	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:59	0	0	100	29.11	0.37	12.6	4.859	5.48	2.29	17.43	40.7	Clear	None
10:02	3	3	100	29.11	0.45	12.7	4.616		1.42	17.99	38.4	Clear	None
10:05	3	6	100	29.14	0.53	12.78	4.623	4.05	0.56	18.7	37	Clear	None
10:08	3	9	100	29.54	0.61	13.07	4.634	4.49	0.34	18.96	37.7	Clear	None
10:11	3	12	100	29.54	0.69	13.25	4.637		0.31	19.11	39.6	Clear	None
10:14	3	15	100	29.85	0.77	13.15	4.639	4.02	0.3	19.13	39.8	Clear	None
10:17	3	18	100	29.85	0.85	13.12	4.64			0.3	40.8	Clear	None
10:19	2	20	100	30.15	0.90	13.16	4.641	4.48	0.39	19.21	42	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing already in well. At pull 6 started pulling only air couldn't sample

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: MW21
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189520

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHAAP-ONFS-GW-01			**Date**	11/28/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	5.06	**Total Depth (ft-bmp)**	6.88	**Water Column (ft)**	1.82	**Gallons in Well**	0.07
Purge Start		**Pump Intake (ft-bmp)**	6.88	**Purge Method**	No-Purge	**Purge Equipment**	Bailer
Purge End	NA	**Volumes Purged**	NA	**Sample ID**	LHAAP-ONFS-GW-01-112922	**Sampled by**	Daniel Luneau
Sample Time	15:40	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:14	0	0	180	5.06	0.00							Brown	

Comments: No field parameters taken because the well was bailed dry.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: _____ Well Locked at Arrival: _____

Condition of Well: _____ Well Locked at Departure: _____

Well Completion: _____ Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189521

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHAAP-ONFS-GW-04			**Date**	11/16/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	11.37	**Total Depth (ft-bmp)**	25.53	**Water Column (ft)**	14.16	**Gallons in Well**	0.58
Purge Start	10:55	**Pump Intake (ft-bmp)**	23	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:00	**Volumes Purged**		**Sample ID**	LHAAP-ONFS-GW-03-111622	**Sampled by**	Daniel Luneau
Sample Time	11:00	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:55	0	0	180	11.37	0.00	6.62	3.64	756	6.79	17.63	254	Brown	

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: _____ Well Locked at Arrival: _____

Condition of Well: _____ Well Locked at Departure: _____

Well Completion: _____ Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189522

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHAAP-ONFS-GW-04			**Date**	11/28/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	1	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	37.30	**Total Depth (ft-bmp)**	43.94	**Water Column (ft)**	6.64	**Gallons in Well**	0.27
Purge Start		**Pump Intake (ft-bmp)**	43	**Purge Method**	No-Purge	**Purge Equipment**	Bailer
Purge End	NA	**Volumes Purged**	NA	**Sample ID**	LHAAP-ONFS-GW-04-112822	**Sampled by**	Daniel Luneau
Sample Time	16:05	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:05	0	0	180	37.30	0.00	7.11	2.755		2.65	20.9	-101.3	Brown	

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion:

Well Locked at Arrival:

Well Locked at Departure:

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189523

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Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW50			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	29.17	**Total Depth (ft-bmp)**	30.48	**Water Column (ft)**	1.31	**Gallons in Well**	0.85
Purge Start	13:00	**Pump Intake (ft-bmp)**		**Purge Method**	Volumetric	**Purge Equipment**	Peristaltic
Purge End		**Volumes Purged**	2.35	**Sample ID**	LHAAP-LHSMW50-111722	**Sampled by**	Daniel Luneau
Sample Time	13:45	**Gallons Purged**	2	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:30	0	0	180	29.17	0.00	6.81	3.904		4.53	16.78	198.8	Reddish brown	

Comments: Approximately three well volumes were purged with a bailer. The well almost went dry. Waited for recharge and then sampled. Bladder pump tubing was observed in the well.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot

1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well:

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189524

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW54			**Date**	11/29/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, , winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	19.00	**Total Depth (ft-bmp)**	45.41	**Water Column (ft)**	26.41	**Gallons in Well**	17.17
Purge Start	15:35	**Pump Intake (ft-bmp)**	40.41	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:26	**Volumes Purged**		**Sample ID**	LHAAP-LHSMW54-112922	**Sampled by**	Andrew Parker
Sample Time	16:15	**Gallons Purged**		**Replicate/ Code No.**	LHAAP-FD-4-112922	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:40	0	0	200	19.00	0.05	6.49	1.374	264	0.79	19.35	53.9	Rusty	None
15:43	3	3	200	19.40	0.00	6.38	1.356	131	0.23	19.5	57.4	Rusty	None
15:46	3	6	200	19.40	0.00	6.32	1.355		0.16	19.33	58.6	Rusty	None
15:49	3	9	200	19.43	0.00	6.29	1.352	102	0.11	19.33	59	Rusty	None
15:52	3	12	200	19.45	0.00	6.29	1.351	102	0.09	19.23	58.5	Rusty	None
15:55	3	15	200	19.45	0.00	6.29	1.351	94.9	0.1	19.08	57.5	Rusty	None
15:58	3	18	200	19.45	0.00	6.29	1.348	99.4	0.1	19.08	56.6	Rusty	None
16:01	3	21	200	19.52	0.00	6.31	1.349	102	1.1	19.02	55.8	Rusty	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	8	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: PA3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189525

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	MW2			**Date**	11/16/2022
Project Name/Location	LHAAP		**Weather(°F)**	50 °F, Overcast, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	25.92	**Total Depth (ft-bmp)**	42.65	**Water Column (ft)**	16.73	**Gallons in Well**	10.87
Purge Start	10:05	**Pump Intake (ft-bmp)**	37.65	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	10:35	**Volumes Purged**		**Sample ID**	LHAAP-MW-2-111622	**Sampled by**	Andrew Parker
Sample Time	10:35	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:08	0	0	100	25.92	0.08	5.62	3.487	0	6.26	16.85	125.5	Clear	Mild
10:11	3	3	100	25.92	0.08	5.69	3.491	0	6.19	16.86	118.6	Clear	Mild
10:14	3	6	100	25.92	0.24	5.63	3.491	0	6.13	16.81	114.2	Clear	Mild
10:17	3	9	100	25.92	0.32	5.65	3.592	0	6.54	17.18	113.1	Clear	Mild
10:20	3	12	100	25.92	0.40	5.55	4.174	0	6.17	18.93	104.5	Clear	Mild
10:23	3	15	100	25.92	0.48	5.55	4.203	0	5.62	19.01	101.1	Clear	Mild
10:26	3	18	100	25.92	0.55	5.56	4.19	0	5.94	18.66	98	Clear	Mild

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	no
Condition of Well:	Needs repairs	Well Locked at Departure:	no
Well Completion:		Key Number To Well:	2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189526

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	MW23			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, , winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	28.54	**Total Depth (ft-bmp)**	46.69	**Water Column (ft)**	18.15	**Gallons in Well**	11.80
Purge Start	11:45	**Pump Intake (ft-bmp)**	41.69	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:19	**Volumes Purged**	0.07	**Sample ID**	LHAAP-MW-23-111722	**Sampled by**	Andrew Parker
Sample Time	12:20	**Gallons Purged**		**Replicate/ Code No.**	LHAAP-018-DEB-4-111722	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:54	0	0	100	28.43	0.24	7.72	1.869	14.4	7.38	19.15	-38.5	Clear	None
11:57	3	3	100	28.43	0.32	7.69	1.876	0	7.27	19.15	-36.7	Clear	None
12:00	3	6	100	28.43	0.40	7.59	1.867	0	8.11	19.12	-35.2	Clear	None
12:03	3	9	100	28.84	0.48	7.57	1.87	7.75	7.37	19.11	-32.9	Clear	None
12:06	3	12	100	28.84	0.55	7.59	1.8744	0	7.1	19.18	-32.9	Clear	None
12:09	3	15	100	28.84	0.63	7.6	1.877	0	7.11	19.19	-34	Clear	None
12:12	3	18	100	28.84	0.71	7.54	1.877		7.45	19.25	-33.2	Clear	None
12:15	3	21	100	28.84	0.79	7.58	1.87	0	7.4	19.23	-31.3	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Issues with air line. EB taken here

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: MW23
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189527

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	MW3			**Date**	11/16/2022
Project Name/Location	LHAAP		**Weather(°F)**	50 °F, Sunny, winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	26.95	**Total Depth (ft-bmp)**	49.54	**Water Column (ft)**	22.59	**Gallons in Well**	14.68
Purge Start	13:35	**Pump Intake (ft-bmp)**	44.54	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	14:05	**Volumes Purged**		**Sample ID**	LHAAP-MW3-GW-03	**Sampled by**	Andrew Parker
Sample Time	14:00	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:38	0	0	100	26.95	0.08	6.85	0.904	0	10.49	18.68	62	Clear	None
13:41	3	3	100	26.95	0.16	6.46	1.646	0	1.64	19.04	71.8	Clear	None
13:44	3	6	100	27.48	0.24	6.43	1.61	0	2.39	19.08	70.1	Clear	None
13:47	3	9	100	27.48	0.32	6.44	1.605	0	4	19.18	70.3	Clear	None
13:50	3	12	100	27.48	0.40	6.44	1.604	0	5.24	19.2	70.8	Clear	None
13:53	3	15	100	27.75	0.48	6.39	1.6	0	5.25	19.26	70.4	Clear	None
13:56	3	18	100	27.75	0.55	6.43	1.602	0	5.62	19.27	71.5	Clear	None
13:59	3	21	100	27.75	0.63	6.44	1.597	0	5.71	19.32	71.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing already in well

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:
Condition of Well:
Well Completion: Stick-up
Well Locked at Arrival: no
Well Locked at Departure: no
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189528

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	WW0408			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, , winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	21.45	**Total Depth (ft-bmp)**	43.66	**Water Column (ft)**	22.21	**Gallons in Well**	14.44
Purge Start	14:55	**Pump Intake (ft-bmp)**	38.66	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-ONFS-DEB-6-111722	**Sampled by**	Andrew Parker
Sample Time	15:25	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	100		0.03	7.28	2.692		8.27	19.9	-27.1	Clear	Mild
14:59	4	4	100	20.45	0.13	7.15	3.977	25.4	4.6	20.45	-40.4	Clear	Mild
15:02	3	7	100	20.45	0.21	7.18	4.024		5.45	20.36	-43.1	Clear	Mild
15:05	3	10	100	20.45	0.29	7.2	4.081	26.6	60.6	20.62	-44.2	Clear	Mild
15:08	3	13	100	20.45	0.37	7.23	4.045		5.74	20.58	-44.2	Clear	Mild
15:11	3	16	100	21.92	0.45	7.24	4.019	15.9	5.75	20.56	-43.4	Clear	Mild
15:15	4	20	100	21.92	0.55	7.2	4.087		3.57	20.4	-43.4	Clear	Mild
15:18	3	23	100	21.92	0.63	7.21	4.059	2.16	5.48	20.57	-41.7	Clear	Mild

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: 04WW08
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189529

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	WW0408			**Date**	11/17/2022
Project Name/Location	LHAAP		**Weather(°F)**	57 °F, , winds at mph.			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	Stainless Steel
Static Water Level (ft-bmp)	21.45	**Total Depth (ft-bmp)**	43.66	**Water Column (ft)**	22.21	**Gallons in Well**	14.44
Purge Start	14:54	**Pump Intake (ft-bmp)**	38.66	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-04WW08-11172022	**Sampled by**	Andrew Parker
Sample Time	15:25	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:55	0	0	100		0.03	7.28	2.692		8.27	19.9	-27.1	Clear	Mild
14:59	4	4	100	20.45	0.13	7.15	3.977	25.4	4.6	20.45	-40.4	Clear	Mild
15:02	3	7	100	20.45	0.21	7.18	4.024		5.45	20.36	-43.1	Clear	Mild
15:05	3	10	100	20.45	0.29	7.2	4.081	26.6	60.6	20.62	-44.2	Clear	Mild
15:08	3	13	100	20.45	0.37	7.23	4.045		5.74	20.58	-44.2	Clear	Mild
15:11	3	16	100	21.92	0.45	7.24	4.019	15.9	5.75	20.56	-43.4	Clear	Mild
15:15	4	20	100	21.92	0.55	7.2	4.087		3.57	20.4	-43.4	Clear	Mild
15:18	3	23	100	21.92	0.63	7.21	4.059	2.16	5.48	20.57	-41.7	Clear	Mild

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: 04WW08
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189530

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	04WW01			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	12.17	**Total Depth (ft-bmp)**	27.22	**Water Column (ft)**	15.05	**Gallons in Well**	9.78
Purge Start	08:53	**Pump Intake (ft-bmp)**	21	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	09:20	**Volumes Purged**	0.15	**Sample ID**	LHAAP-04WW01-20221111	**Sampled by**	Laura Gloria
Sample Time	09:15	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:56	0	0	150	11.78	0.16	6.52	3417	3.37	0.35	19.82	-90	Clear	None
08:56	0	0	150	11.78	0.16	6.52	3.417	3.37	0.35	19.82	-90	Clear	None
08:59	3	3	150	11.78	0.24	6.52	3399	3.37	0.16	19.85	-96	Clear	None
08:59	3	3	150	11.78	0.24	6.52	3.399	3.37	0.16	19.85	-96	Clear	None
09:02	3	6	150	12.85	0.32	6.53	3364	3.37	0.11	19.88	-89.6	Clear	None
09:02	3	6	150	12.85	0.32	6.53	3.364	3.37	0.11	19.88	-89.6	Clear	None
09:05	3	9	150	12.85	0.40	6.53	3330	2.59	0.1	19.9	-88.5	Clear	None
09:05	3	9	150	12.85	0.40	6.53	3.33	2.59	0.1	19.9	-88.5	Clear	None
09:08	3	12	150	13.20	0.48	6.54	3284	2.29	0.1	19.9	-87	Clear	None
09:08	3	12	150	13.20	0.48	6.54	3.284	2.29	0.1	19.9	-87	Clear	None
10:11	63	75	150	13.20	0.55	6.55	3.241	2.29	0.1	19.9	-90.6	Clear	None
10:11	63	75	150	13.20	0.55	6.55	3241	2.29	0.1	19.9	-90.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Northwest of the New Fire Station
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502 master key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189531

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	04WW07			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	71.6 degrees F and Cloudy. The wind is blowing E at 6.9 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.89	**Total Depth (ft-bmp)**	22.24	**Water Column (ft)**	12.35	**Gallons in Well**	8.03
Purge Start	09:45	**Pump Intake (ft-bmp)**	16	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:15	**Volumes Purged**	0.25	**Sample ID**	LHAAP-04WW07-20221111	**Sampled by**	Laura Gloria
Sample Time	10:10	**Gallons Purged**	2	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:48	0	0	150	9.66	0.08	6.59	3367	12.52	0.64	21.95	-91.4	Clear	None
09:48	0	0	150	9.66	0.08	6.59	3.367	12.52	0.64	21.95	-91.4	Clear	None
09:51	3	3	150	9.66	0.16	6.59	3335	12.8	0.29	21.81	-111.7	Clear	None
09:51	3	3	150	9.66	0.16	6.59	3.335	12.8	0.29	21.81	-111.7	Clear	None
09:54	3	6	150	10.60	0.24	6.59	3299	12.5	0.21	21.83	-117	Clear	None
09:54	3	6	150	10.60	0.24	6.59	3.299	12.5	0.21	21.83	-117	Clear	None
09:57	3	9	150	10.60	0.32	6.6	3214	11.2	0.17	21.95	-122.5	Clear	None
09:57	3	9	150	10.60	0.32	6.6	3.214	11.2	0.17	21.95	-122.5	Clear	None
10:00	3	12	150	11.05	0.40	6.59	3059	10.7	0.15	22.01	-135.8	Clear	None
10:00	3	12	150	11.05	0.40	6.59	3.059	10.7	0.15	22.01	-135.8	Clear	None
10:03	3	15	150	11.05	0.34	6.58	2926	8.43	0.13	22	-145.6	Clear	None
10:03	3	15	150	11.05	0.34	6.58	2.926	8.43	0.13	22	-145.6	Clear	None
10:06	3	18	150	11.62	0.42	6.57	2787	8.05	0.11	21.96	-162.4	Clear	None
10:06	3	18	150	11.62	0.42	6.57	2.787	8.05	0.11	21.96	-162.4	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Conductivity was measured as us/cm.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: In front of the New Fire station
Well Locked at Arrival: yes
Condition of Well: Good condition
Well Locked at Departure: yes
Well Completion: Stick-up
Key Number To Well: 2502 master key

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189532

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	120			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	13.76	**Total Depth (ft-bmp)**	26.8	**Water Column (ft)**	13.04	**Gallons in Well**	2.12
Purge Start	11:10	**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:39	**Volumes Purged**	0.47	**Sample ID**	LHAAP-120-111522	**Sampled by**	Laura Gloria
Sample Time	11:35	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:13	0	0	100	14.93	0.08	5.54	1.058	37.2	0.29	19.06	159.9	Brown	None
11:16	3	3	100	14.93	0.16	5.54	1.049	38.5	0.52	19.37	160.2	Brown	None
11:19	3	6	100	18.00	0.24	5.56	1.028	52	0.5	19.95	160.3	Brown	None
11:22	3	9	100	18.00	0.32	5.57	1.009	62.4	0.61	20.25	158	Brown	None
11:25	3	12	100	19.43	0.40	5.57	0.995	68	0.65	20.05	158	Brown	None
11:28	3	15	100	19.43	0.48	5.56	1.036	74.2	0.67	19.9	160.7	Brown	None
11:31	3	18	100	19.43	0.55	5.52	1.092	74.2	0.46	19.68	159.4	Brown	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189533

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	12WW01			**Date**	11/15/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	44.6 degrees F and Cloudy. The wind is blowing NW at 10.3 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.75	**Total Depth (ft-bmp)**	29.85	**Water Column (ft)**	7.10	**Gallons in Well**	4.61
Purge Start	16:25	**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:46	**Volumes Purged**	0.33	**Sample ID**	LHAAP-12WW01-111522	**Sampled by**	Laura Gloria
Sample Time	16:45	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:28	0	0	200	23.38	0.16	5.98	5.785	14.4	0.33	18.09	-58	Clear	Medium
16:31	3	3	200	23.38	0.32	5.99	5.84	15.2	0.22	18.03	-62.3	Clear	Medium
16:34	3	6	200	23.69	0.48	5.99	5.861	15.5	0.11	18.15	-66.1	Clear	Medium
16:37	3	9	200	23.69	0.63	5.99	5.877	15.5	0.12	18.27	-68.4	Clear	Medium
16:40	3	12	200	24.03	0.79	5.99	5.885	15.6	0.11	18.3	-69.7	Clear	Medium

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189534

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	12WW02			**Date**	11/15/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	47.1 degrees F and Cloudy. The wind is blowing NW at 10.3 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.04	**Total Depth (ft-bmp)**	31.6	**Water Column (ft)**	10.56	**Gallons in Well**	6.86
Purge Start	15:40	**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:08	**Volumes Purged**	0.15	**Sample ID**	LHAAP-12WW02-111522	**Sampled by**	Laura Gloria
Sample Time	16:05	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:43	0	0	200	21.58	0.16	5.97	1.083	6.39	0.46	18.66	-7.1	Clear	Mild
15:46	3	3	200	21.58	0.32	5.96	1.089	2.26	0.34	18.82	-14.9	Clear	Mild
15:49	3	6	200	21.70	0.48	5.95	1.089	1.92	0.35	18.95	-21.1	Clear	Mild
15:52	3	9	200	21.70	0.63	5.95	1.09	1.86	0.48	19.18	-27.2	Clear	Mild
15:55	3	12	200	21.90	0.79	5.95	1.092	2.3	0.9	19.2	-28.6	Clear	Mild
15:58	3	15	200	21.90	0.95	5.95	1.09	2.25	0.41	19.31	-24.6	Clear	Mild
16:01	3	18	200	21.90	1.11	5.94	1.089	3.41	0.5	19.33	-31.7	Clear	Mild

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing left in well.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	16WW13			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.06	**Total Depth (ft-bmp)**	22.88	**Water Column (ft)**	13.82	**Gallons in Well**	8.98
Purge Start	16:40	**Pump Intake (ft-bmp)**	27	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	17:02	**Volumes Purged**	0.17	**Sample ID**	LHAAP-16WW13-111622	**Sampled by**	Laura Gloria
Sample Time	17:00	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:43	0	0	200	9.59	0.16	5.07	4.247	88.7	0.44	18.7	124.4	Orange	Mild
16:46	3	3	200	9.59	0.32	5.07	4.272	100	0.19	18.72	121.6	Orange	Mild
16:49	3	6	200	9.88	0.48	5.08	4.269	94.4	0.14	18.79	119.6	Orange	Mild
16:52	3	9	200	9.88	0.63	5.07	4.277	99.5	0.28	18.68	120.8	Orange	Mild
16:55	3	12	200	10.50	0.79	5.07	4.272	83.8	0.2	18.73	121.2	Orange	Mild
16:58	3	15	200	10.50	0.95	5.07	4.272	82.9	0.2	18.72	121.1	Orange	Mild

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing left in well.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189536

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	16WW16			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	21.76	**Total Depth (ft-bmp)**	31.54	**Water Column (ft)**	9.78	**Gallons in Well**	6.36
Purge Start	13:52	**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:18	**Volumes Purged**	0.16	**Sample ID**	LHAAP-16WW16-111622	**Sampled by**	Laura Gloria
Sample Time	14:15	**Gallons Purged**	1	**Replicate/ Code No.**	LHAAP-016-DEB-2-111622	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:55	0	0	200	21.95	0.16	6.07	3.211	8.58	0.16	19.92	122.9	Clear	None
13:58	3	3	200	21.95	0.32	6.11	3.295	6.74	0.4	19.53	128.6	Clear	None
14:01	3	6	200	21.97	0.48	6.12	3.314	4.65	0.24	19.61	131.7	Clear	None
14:04	3	9	200	21.97	0.63	6.13	3.339	4.12	0.24	19.69	135.3	Clear	None
14:07	3	12	200	21.97	0.79	6.14	3.376	3.39	0.24	19.64	138.6	Clear	None
14:10	3	15	200	21.97	0.95	6.14	3.419	3.8	0.18	19.39	142	Clear	None
14:13	3	18	200	21.97	1.11	6.15	3.599	4.16	0.16	19.33	144.2	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing left in well. Sample taken from tubing.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189537

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	16WW36			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.49	**Total Depth (ft-bmp)**	24.84	**Water Column (ft)**	7.35	**Gallons in Well**	4.78
Purge Start	15:26	**Pump Intake (ft-bmp)**	21	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:53	**Volumes Purged**	0.31	**Sample ID**	LHAAP-16WW36-111622	**Sampled by**	Laura Gloria
Sample Time	15:50	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:29	0	0	200	17.84	0.16	5.84	10.76	23.9	0.53	18.93	116	Orange	None
15:32	3	3	200	17.84	0.32	5.83	10.81	11.6	0.64	18.93	127.7	Orange	None
15:35	3	6	200	17.93	0.48	5.83	10.83	7.08	0.53	18.99	143.9	Orange	None
15:38	3	9	200	17.93	0.63	5.82	10.84	3.87	0.49	18.96	153.2	Orange	None
15:41	3	12	200	18.01	0.79	5.78	10.84	1.53	0.1	18.94	171.2	Orange	None
15:44	3	15	200	18.01	0.95	5.81	10.84	1.03	0.42	18.89	179.2	Orange	None
15:47	3	18	200	18.05	1.11	5.81	10.83	0.3	0.35	18.93	186	Orange	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing left in well.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189538

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	18CPTMW23			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	74.3 degrees F and Clear. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.85	**Total Depth (ft-bmp)**	34.2	**Water Column (ft)**	24.35	**Gallons in Well**	15.83
Purge Start	12:50	**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:22	**Volumes Purged**	0.09	**Sample ID**	LHAAP-18CPTMW23-111522	**Sampled by**	Laura Gloria
Sample Time	13:20	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:53	0	0	200	9.97	0.16	6.03	0.695	29.4	0.52	18.04	-39.7	Orange	None
12:56	3	3	200	9.97	0.32	5.86	-23	163	0.12	18.08	-23.6	Orange	None
12:59	3	6	200	10.95	0.48	5.83	0.634	170	0.17	18.12	-21.4	Orange	None
13:02	3	9	200	10.95	0.63	5.78	0.615	422	0.23	18.11	-18.9	Orange	None
13:05	3	12	200	11.57	0.79	5.72	0.611	391	0.05	18.47	21.7	Orange	None
13:08	3	15	200	11.57	0.95	5.75	0.615	370	0.08	18.44	27	Orange	None
13:11	3	18	200	12.01	1.11	5.59	0.598	278	0.09	18.1	28.5	Orange	None
13:14	3	21	200	12.01	0.00	5.55	0.595	88.1	0.12	17.9	34.7	Orange	None
13:17	3	24	200		1.43	5.52	0.59	29.4	0.09	17.94	42.5	Orange	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Initially water was extremely sedimenty. Allow more time for water to clear up.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

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ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	35AWW06			**Date**	11/10/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.77	**Total Depth (ft-bmp)**	30.1	**Water Column (ft)**	11.33	**Gallons in Well**	7.36
Purge Start	09:26	**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:06	**Volumes Purged**	0.27	**Sample ID**	LHAAP-35WW06-111422	**Sampled by**	Laura Gloria
Sample Time	09:50	**Gallons Purged**	2	**Replicate/ Code No.**	LHAAP-FD-1-111422	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:29	0	0	100	19.17	0.08	6.56	5655	42.8	0.62	16.51	-36.1	Clear	None
09:32	3	3	100	19.17	0.16	6.56	5661	31.9	0.57	16.7	-38	Clear	None
09:35	3	6	100	19.58	0.24	6.54	5674	24.5	0.47	16.63	-32.7	Clear	None
09:38	3	9	100	19.58	0.32	6.55	5673	25.5	0.42	16.68	-32.1	Clear	None
09:41	3	12	100	19.75	0.40	6.58	5694	26.1	0.4	16.63	-38	Clear	None
09:44	3	15	100	19.75	0.48	6.58	5671	20.7	0.38	16.81	-33.7	Clear	None
09:47	3	18	100	19.79	0.55	6.58	5645	18.5	0.38	17.01	-32.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	8	None

Comments: Conductivity was measured as us/cm. MSMD was taken at 09:55

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:		Well Locked at Arrival:	yes
Condition of Well:	Good condition	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

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ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	35AWW16			**Date**	11/10/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	17.16	**Total Depth (ft-bmp)**	37.37	**Water Column (ft)**	20.21	**Gallons in Well**	3.28
Purge Start	13:00	**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:30	**Volumes Purged**	0.30	**Sample ID**	LHAAP-35AWW16-20221111	**Sampled by**	Laura Gloria
Sample Time	13:25	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:03	0	0	150	17.72	0.08	6.31	11663	11.1	0.32	19.9	10.5	Clear	None
13:03	0	0	150	17.72	0.08	6.31	11.663	11.1	0.32	19.9	10.5	Clear	None
13:06	3	3	150	17.72	0.16	6.31	11669	11.1	0.4	19.87	12.2	Clear	None
13:06	3	3	150	17.72	0.16	6.31	11.669	11.1	0.4	19.87	12.2	Clear	None
13:09	3	6	150	17.88	0.24	6.31	11678	10.4	0.17	19.78	17.5	Clear	None
13:09	3	6	150	17.88	0.24	6.31	11.678	10.4	0.17	19.78	17.5	Clear	None
13:12	3	9	150	17.88	0.32	6.31	11680	8.97	0.14	19.76	18.1	Clear	None
13:12	3	9	150	17.88	0.32	6.31	11.68	8.97	0.14	19.76	18.1	Clear	None
13:15	3	12	150	17.91	0.40	6.31	11680	8.03	0.07	19.75	15.5	Clear	None
13:15	3	12	150	17.91	0.40	6.31	11.68	8.03	0.07	19.75	15.5	Clear	None
13:18	3	15	150	17.91	0.48	6.31	11687	7.08	0.1	19.73	9	Clear	None
13:18	3	15	150	17.91	0.48	6.31	11.687	7.08	0.1	19.73	9	Clear	None
13:21	3	18	150	18.01	0.55	6.31	11684	6.89	0.2	19.73	10.8	Clear	None
13:21	3	18	150	18.01	0.55	6.31	11.684	6.89	0.2	19.73	10.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	3	None
PFAS	250mL HDPE Plastic	2	None

Comments: Well lid does not completely close.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Well Locked at Arrival: yes

Condition of Well: Good condition

Well Locked at Departure: yes

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

ARCADIS

Groundwater Sampling Form

Well Completion: Stick-up

Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

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ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	35AWW20			**Date**	11/10/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.82	**Total Depth (ft-bmp)**	36.02	**Water Column (ft)**	17.20	**Gallons in Well**	2.79
Purge Start	11:40	**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:03	**Volumes Purged**	0.36	**Sample ID**	LHAAP-35AWW20	**Sampled by**	Laura Gloria
Sample Time	12:00	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:43	0	0	150	18.87	0.08	6.41	5136	1.63	0.51	22.09	-60.1	Clear	None
11:43	0	0	150	18.87	0.08	6.41	5.136	1.63	0.51	22.09	-60.1	Clear	None
11:46	3	3	150	18.87	0.16	6.41	5107	1.45	0.37	22.15	-64.9	Clear	None
11:46	3	3	150	18.87	0.16	6.41	5.107	1.45	0.37	22.15	-64.9	Clear	None
11:49	3	6	150	21.00	0.24	6.41	5094	1.66	0.48	22.17	-64.9	Clear	None
11:49	3	6	150	21.00	0.24	6.41	5.094	1.66	0.48	22.17	-64.9	Clear	None
11:52	3	9	150	21.00	0.32	6.42	5085	1.79	0.46	22.18	-66.4	Clear	None
11:52	3	9	150	21.00	0.32	6.42	5.085	1.79	0.46	22.18	-66.4	Clear	None
11:55	3	12	150	21.33	0.40	6.42	5068	1.27	0.46	22.19	-68.8	Clear	None
11:55	3	12	150	21.33	0.40	6.42	5.068	1.27	0.46	22.19	-68.8	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Vehicle Wash rack
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189543

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	35BWW07			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	27.15	**Total Depth (ft-bmp)**	30.15	**Water Column (ft)**	3.00	**Gallons in Well**	0.49
Purge Start	08:53	**Pump Intake (ft-bmp)**	28.5	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	09:37	**Volumes Purged**	2.04	**Sample ID**	LHAAP-35BWW07-112922	**Sampled by**	Laura Gloria
Sample Time	09:20	**Gallons Purged**	1	**Replicate/ Code No.**	LHAAP-FD-3-GW-112922; LHAAP-36BWW07-112922 (MS/MSD)	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
08:57	0	0	200	27.15	0.00	6.99	0.851	4.22	1.57	18.3	98.8	Clear	None
09:04	7	7	200	27.46	0.00	6.91	0.852	3.81	1.51	18.33	46	Clear	None
09:07	3	10	200	27.46	0.00	7.03	0.861	3.22	0.79	18.41	8.5	Clear	None
09:10	3	13	200	28.20	0.00	7.03	0.861	3.33	0.86	18.46	2.9	Clear	None
09:13	3	16	200	28.12	0.00	6.98	0.859	3.08	1.05	18.52	9.2	Clear	None
09:16	3	19	200	28.17	0.00	6.99	0.856	3.75	0.74	18.22	13.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	8	None

Comments: Tubing left in well.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant Area 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

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ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	35BWW23			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	28.66	**Total Depth (ft-bmp)**	33.6	**Water Column (ft)**	4.94	**Gallons in Well**	3.21
Purge Start	14:22	**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	14:50	**Volumes Purged**	0.47	**Sample ID**	LHAAP-35BWW23-111722	**Sampled by**	Laura Gloria
Sample Time	14:40	**Gallons Purged**	1.5	**Replicate/ Code No.**	LHAAP-047-DEB-5-111722	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
14:25	0	0	200	29.00	0.16	6.9	0.45	0	2.73	18.79	355	Clear	None
14:28	3	3	200	29.00	0.32	6.78	0.45	0	2.5	18.89	359	Clear	None
14:31	3	6	200	29.00	0.48	6.6	0.45	0	2.08	18.97	364	Clear	None
14:34	3	9	200	29.20	0.63	6.63	0.448	0	2.25	18.9	370	Clear	None
14:37	3	12	200	29.00	0.79	6.59	0.448	0	2.22	18.96	373	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None
PFAS	250mL HDPE Plastic	4	None

Comments: Tubing located in well. Sample was taken from tubing.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant Area 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189545

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	46WW06			**Date**	11/28/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	42.45	**Total Depth (ft-bmp)**	50.6	**Water Column (ft)**	8.15	**Gallons in Well**	5.30
Purge Start	11:57	**Pump Intake (ft-bmp)**	45.6	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	12:50	**Volumes Purged**	0.23	**Sample ID**	LHAAP-46WW06-112822	**Sampled by**	Laura Gloria
Sample Time	12:50	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
12:20	0	0	100	42.10	0.00	7.01	2.203		9.94	16.82	-34.1	Orange	None
12:23	3	3	100	42.00	0.00	7.35	2.184		10.33	16.64	-64.8	Orange	None
12:29	6	9	100	42.00	0.00	7.68	2.158	1100	10.06	16.44	-25.4	Orange	None
12:32	3	12	100	42.10	0.00	7.42	2.012	1100	11.14	16.69	-37.5	Orange	None
12:35	3	15	100	42.10	0.00	7.7	1.936	1100	10.51	16.62	-63.8	Orange	None
12:40	5	20	100	42.10	0.00	7.98	1.877	1100	9.92	16.62	-25.7	Orange	None
12:43	3	23	100	42.10	0.00	7.17	1.92	1100	11.09	17.3	-46.2	Orange	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: TD(.5)=25.3 highly turbid, causing longer sample time , valve clogged . Tubing located in well.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: PA2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189546

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	46WW11			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	76.8 degrees F and Mostly Cloudy. The wind is blowing at 4.7 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	27.21	**Total Depth (ft-bmp)**	32.7	**Water Column (ft)**	5.49	**Gallons in Well**	3.57
Purge Start	15:47	**Pump Intake (ft-bmp)**	29	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	16:22	**Volumes Purged**	0.42	**Sample ID**	LHAAP-46WW11-111722	**Sampled by**	Laura Gloria
Sample Time	16:10	**Gallons Purged**	1.5	**Replicate/ Code No.**	LHAAP-046-DEB-7-111722	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:50	0	0	200	27.21	0.16	5.75	1.05	0	6.55	19.3	323	Clear	None
15:53	3	3	200	27.70	0.32	5.63	1.05	0	1.89	19.42	345	Clear	None
15:56	3	6	200	27.99	0.48	5.6	1.05	0	1.66	19.59	364	Clear	None
15:59	3	9	200	27.99	0.63	5.59	1.05	0	1.38	19.56	375	Clear	None
16:02	3	12	200	28.20	0.79	5.56	1.04	0	0.73	19.78	386	Clear	None
16:05	3	15	200	28.20	0.95	5.54	1.04	0	0.38	19.89	398	Clear	None
16:08	3	18	200	28.20	1.11	5.53	1.04	0	0.28	19.87	400	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None
PFAS	250mL HDPE Plastic	4	None

Comments: Tubing in well. DEB sample taken.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant Area 2
Condition of Well:
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189547

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	47WW28			**Date**	11/16/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**					
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.80	**Total Depth (ft-bmp)**	25	**Water Column (ft)**	2.20	**Gallons in Well**	1.43
Purge Start	13:03	**Pump Intake (ft-bmp)**	20	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	13:31	**Volumes Purged**	1.05	**Sample ID**	LHAAP-47WW28-111722	**Sampled by**	Laura Gloria
Sample Time	13:30	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
13:06	0	0	200	22.80	0.16	6.78	2.5	195	1.21	19.23	309	Brown	None
13:09	3	3	200	23.25	0.32	6.69	2.48	341	1.03	19.01	314	Brown	None
13:12	3	6	200	23.38	0.48	6.72	2.45	347	0.86	19.08	318	Brown	None
13:15	3	9	200	23.38	0.63	6.59	2.44	281	0.77	19.21	321	Brown	None
13:19	4	13	200	23.42	0.85	6.58	2.43	310	0.72	19.4	323	Brown	None
13:22	3	16	200	23.42	1.00	6.57	2.44	637	0.79	19.27	322	Brown	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well is replacing LHSMW42. No tubing in well. We'll name is fading, but we'll number is located on the well plug.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189548

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	50WW08			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	22.54	**Total Depth (ft-bmp)**	32.42	**Water Column (ft)**	9.88	**Gallons in Well**	1.61
Purge Start	09:50	**Pump Intake (ft-bmp)**	24	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:13	**Volumes Purged**	0.93	**Sample ID**	LHAAP-50WW08-111722	**Sampled by**	Laura Gloria
Sample Time	10:15	**Gallons Purged**	1.5	**Replicate/ Code No.**	LHAAP-050-DEB-3-111722	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
09:53	0	0	200	22.91	0.16	6.89	2.374	42.4	0.57	16.88	-39.4	Clear	None
09:56	3	3	200	22.91	0.32	6.89	2.384	18.6	0.32	17.07	-31.4	Clear	None
09:59	3	6	200	22.86	0.48	6.88	2.385	14.6	0.3	17.11	-23.2	Clear	None
10:02	3	9	200	22.86	0.63	6.88	2.386	11.7	0.31	17.22	-13.2	Clear	None
10:05	3	12	200	22.88	0.79	6.88	2.385	8.53	0.33	17.21	-2.2	Clear	None
10:08	3	15	200	22.88	0.95	6.88	2.384	7.47	0.28	17.25	9.7	Clear	None
10:11	3	18	200	22.88	1.11	6.87	2.38	6.24	0.27	17.39	17.9	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing left in well. Tubing sampled from.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189549

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	50WW12			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	18.90	**Total Depth (ft-bmp)**	37.88	**Water Column (ft)**	18.98	**Gallons in Well**	3.08
Purge Start	10:30	**Pump Intake (ft-bmp)**	27	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:00	**Volumes Purged**	0.32	**Sample ID**	LHAAP-50WW12-111422	**Sampled by**	Laura Gloria
Sample Time	10:55	**Gallons Purged**	1	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:33	0	0	100	18.90	0.08	6.4	4.958	5.55	0.4	17.09	129.9	Clear	None
10:36	3	3	100	19.05	0.16	6.45	4.966	2.25	0.28	17.12	120.7	Clear	None
10:39	3	6	100	19.05	0.24	6.52	4.96	1.1	0.24	17.47	111.1	Clear	None
10:42	3	9	100	19.06	0.32	6.56	4.966	0.8	0.19	17.6	105.6	Clear	None
10:45	3	12	100	19.60	0.40	6.55	4.967	0.77	0.18	17.56	103.6	Clear	None
10:49	4	16	100	19.09	0.48	6.54	4.95	0.32	0.16	17.69	98.7	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189550

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	50WW13			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	2	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.37	**Total Depth (ft-bmp)**	37.6	**Water Column (ft)**	17.23	**Gallons in Well**	2.80
Purge Start	11:21	**Pump Intake (ft-bmp)**	28	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:43	**Volumes Purged**	0.54	**Sample ID**	LHAAP-50WW13-111422	**Sampled by**	Laura Gloria
Sample Time	11:40	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:24	0	0	100	20.33	0.08	6.65	2.151	5.02	0.14	18.15	91.7	Clear	None
11:27	3	3	100	20.33	0.16	6.7	2.142	4.05	0.13	18.1	86.9	Clear	None
11:30	3	6	100	20.51	0.24	6.75	2.12	3.77	0.08	18.23	82.6	Clear	None
11:33	3	9	100	20.51	0.32	6.75	2.09	3.95	0.08	18.34	80.3	Clear	None
11:36	3	12	100	20.54	0.40	6.75	2.081	3	0.08	18.37	78.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:

Condition of Well: Good condition

Well Completion: Stick-up

Well Locked at Arrival: yes

Well Locked at Departure: yes

Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189551

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW01			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	71.2 degrees F and Cloudy. The wind is blowing NE at 3.4 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	9.47	**Total Depth (ft-bmp)**	17.95	**Water Column (ft)**	8.48	**Gallons in Well**	5.51
Purge Start	10:33	**Pump Intake (ft-bmp)**	12	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:00	**Volumes Purged**	0.27	**Sample ID**	LHAAP-LHSMW01-20221111	**Sampled by**	Laura Gloria
Sample Time	10:55	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:36	0	0	150	9.94	0.08	6.19	5870	3.56	0.23	21.26	58.5	Clear	None
10:36	0	0	150	9.94	0.08	6.19	5.87	3.56	0.23	21.26	58.5	Clear	None
10:39	3	3	150	9.94	0.16	6.19	5208	4.4	0.15	21.16	61.4	Clear	None
10:39	3	3	150	9.94	0.16	6.19	5.208	4.4	0.15	21.16	61.4	Clear	None
10:42	3	6	150	10.06	0.24	6.12	5707	3.5	0.16	21.15	68.9	Clear	None
10:42	3	6	150	10.06	0.24	6.12	5.707	3.5	0.16	21.15	68.9	Clear	None
10:45	3	9	150	10.06	0.32	6.12	5577	4.32	0.15	21.18	70.8	Clear	None
10:45	3	9	150	10.06	0.32	6.12	5.577	4.32	0.15	21.18	70.8	Clear	None
10:48	3	12	150	10.30	0.40	6.09	5556	3.59	0.15	21.23	75.6	Clear	None
10:48	3	12	150	10.30	0.40	6.09	5.556	3.59	0.15	21.23	75.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Well cap is broken.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location:	In front of the New Fire Station.	Well Locked at Arrival:	yes
Condition of Well:	Needs repairs	Well Locked at Departure:	yes
Well Completion:	Stick-up	Key Number To Well:	Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189552

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW18			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph. 11/12				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	27.21	**Total Depth (ft-bmp)**		**Water Column (ft)**		**Gallons in Well**	
Purge Start		**Pump Intake (ft-bmp)**		**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End		**Volumes Purged**		**Sample ID**	LHAAP-LHSMW18-20221112	**Sampled by**	Laura Gloria
Sample Time		**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	

Time	Minutes Elapsed	Total Elapsed Minutes	Rate	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor

Comments: Well is dry.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: _____ Well Locked at Arrival: _____

Condition of Well: _____ Well Locked at Departure: _____

Well Completion: _____ Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute

mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter

mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189553

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW19			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs		**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph. 11/12 cold			
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	26.42	**Total Depth (ft-bmp)**	29.98	**Water Column (ft)**	3.56	**Gallons in Well**	2.31
Purge Start	11:50	**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	12:15	**Volumes Purged**	0.21	**Sample ID**	LHAAP-LHSMW19-20221112	**Sampled by**	Laura Gloria
Sample Time	12:15	**Gallons Purged**		**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
11:50	0	0	100	26.36	0.08	7.63	3.799	5.5	0.55	17.68	70	Clear	None
11:53	3	3	100	26.36	0.00	6.51	3.872	5.5	6.2	17.56	68.8	Clear	None
11:56	3	6	100	26.81	0.16	6.51	3.886	1.1	0.56	17.49	68	Clear	None
11:59	3	9	100	26.81	0.24	6.52	3.888	0.75	0.64	17.51	67.2	Clear	None
12:02	3	12	100	26.81	0.32	6.51	3.901	1.19	4.5	17.51	66.1	Clear	None
12:05	3	15	100	27.10	0.40	6.51	3.892	0.86	0.31	17.54	69.3	Clear	None
12:08	3	18	100	27.10	0.48	6.52	3.866	1.16	0.25	17.73	73.7	Clear	None
12:11	3	21	100	27.37	0.00	6.53	3.831	1.15	0.31	17.75	75.6	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments:

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: LHSMW19
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189554

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW21			**Date**	11/10/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	74.3 degrees F and Clear. The wind is blowing undefined at 0.0 mph. 11/12 cold				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	20.05	**Total Depth (ft-bmp)**	29.69	**Water Column (ft)**	9.64	**Gallons in Well**	6.27
Purge Start	10:37	**Pump Intake (ft-bmp)**	25	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	11:07	**Volumes Purged**	0.24	**Sample ID**	LHAAP-LHSMW21-20221111	**Sampled by**	Laura Gloria
Sample Time	11:05	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:40	0	0	100	20.53	0.08	6.82	2.286	12.3	2.6	18.45	167.7	Clear	None
10:40	0	0	100	20.53	0.08	6.82	2286	12.3	2.6	18.45	167.7	Clear	None
10:43	3	3	100	20.53	0.16	6.82	2.821	6.67	2.1	18.56	189.8	Clear	None
10:46	3	6	100	20.80	0.24	6.82	2.281	4.15	1.6	18.36	169	Clear	None
10:49	3	9	100	20.80	0.24	6.82	2.283	3.7	1.3	18.36	186.5	Clear	None
10:52	3	12	100	20.98	0.32	6.82	2.283	5.52	1.8	18.49	174.3	Clear	None
10:55	3	15	100	21.06	0.40	6.82	2.282	3.8	0.13	18.58	155	Clear	None
10:58	3	18	100	21.06	0.48	6.82	2.278	3.48	0.08	18.59	140	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Key gets stuck in lock. Lock needs to be replaced

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: PA2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189555

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW25			**Date**	11/9/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	31.94	**Total Depth (ft-bmp)**	42.5	**Water Column (ft)**	10.56	**Gallons in Well**	6.86
Purge Start	16:06	**Pump Intake (ft-bmp)**	35	**Purge Method**	Low-Flow	**Purge Equipment**	Bladder
Purge End	16:40	**Volumes Purged**	0.00	**Sample ID**	LHAAP-LHSMW25-112822	**Sampled by**	Laura Gloria
Sample Time	16:30	**Gallons Purged**		**Replicate/ Code No.**	LHAAP-FB-2-112822	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
16:10	0	0	100	31.94	0.00	6.96	1.98	6.23	7.62	19.09	20.2	Clear	None
16:13	3	3	100	32.04	0.00	6.71	2.01	3.73	6.47	19.18	37	Clear	None
16:16	3	6	100	32.04	0.00	6.62	2.02	3.34	5.07	19.21	40.5	Clear	None
16:19	3	9	100	32.07	0.00	6.6	2.03	2.81	3.7	19.17	40.1	Clear	None
16:22	3	12	100	32.07	0.00	6.59	2.04	3.04	2.25	19.16	39.2	Clear	None
16:25	3	15	100	32.12	0.00	6.59	2.07	2.72	2.03	19.15	37.6	Clear	None
16:28	3	18	100	32.12	0.00	6.59	2.1	2.7	2.24	19.18	37	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Tubing left in well

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant Area 2
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: NA

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189556

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW41			**Date**	11/8/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	72.7 degrees F and Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	27.65	**Total Depth (ft-bmp)**	38.1	**Water Column (ft)**	10.45	**Gallons in Well**	6.79
Purge Start	10:27	**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	10:52	**Volumes Purged**	0.22	**Sample ID**	LHAAP-LHSMW41-112922	**Sampled by**	Laura Gloria
Sample Time	10:45	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
10:30	0	0	200	27.88	0.05	6.98	3.137	4.36	0.44	18.58	20.5	Clear	None
10:33	3	3	200	27.88	0.00	6.97	3.143	3.76	0.82	18.63	10.9	Clear	None
10:36	3	6	200	28.50	0.00	6.98	3.151	3.9	0.72	18.64	5.5	Clear	None
10:39	3	9	200	28.50	0.00	6.96	3.157	3.75	0.75	18.66	1.5	Clear	None
10:42	3	12	200	28.06	0.00	6.96	3.153	3.6	0.73	18.71	-1	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250 mL Plastic	2	None

Comments: Tubing within the well but it is completely inside the well, not able to retrieve. Lock needs to be replaced.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant Area 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Master Key 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

01189557

ARCADIS

Groundwater Sampling Form

Project Number	30001997	**Well ID**	LHSMW56R			**Date**	11/10/2022
Project Name/Location	02118231.3006-Balt HTRW AE PFAS ADDL PAs	**Weather(°F)**	79.0 degrees F and Partly Cloudy. The wind is blowing undefined at 0.0 mph.				
Measuring Pt. Description	Top of Inner Casing	**MP Elevation**		**Casing Diameter (in)**	4	**Well Casing Material**	PVC
Static Water Level (ft-bmp)	24.18	**Total Depth (ft-bmp)**	37.6	**Water Column (ft)**	13.42	**Gallons in Well**	8.72
Purge Start	15:22	**Pump Intake (ft-bmp)**	30	**Purge Method**	Low-Flow	**Purge Equipment**	Peristaltic
Purge End	15:43	**Volumes Purged**	0.17	**Sample ID**	LHAAP-LHSMW56R-112922	**Sampled by**	Laura Gloria
Sample Time	15:40	**Gallons Purged**	1.5	**Replicate/ Code No.**	NA	**Sample Type**	Grab

Time	Minutes Elapsed	Total Elapsed Minutes	Rate mL/min	Depth to Water (ft)	Gallon Purged	pH (standard units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temperature °C	Redox (mV)	Appearance	
												Color	Odor
15:25	0	0	200	24.38	0.16	6.41	1.737	3.28	0.44	20.31	213.2	Clear	None
15:28	3	3	200	24.38	0.32	6.3	1.742	2.52	0.41	20.39	182.3	Clear	None
15:31	3	6	200	24.45	0.48	6.43	1.745	2.15	0.41	20.39	133.76	Clear	None
15:34	3	9	200	24.45	0.63	6.4	1.747	2.13	0.41	20.4	135.4	Clear	None
15:36	2	11	200	24.45	0.74	6.44	1.749	2.09	0.42	20.35	134.5	Clear	None

Constituent Sampled	Container	Number	Preservative
PFAS	250mL HDPE Plastic	2	None

Comments: Tubing in well. Well replaced LHSMW56. Black particles observed in water sample.

Well Casing Volume Conversion

Well diameter (inches) = gallons per foot — 1 = 0.04; 1.5 = 0.09; 2.5 = 0.26; 3.5 = 0.50; 6 = 1.47
1.25 = 0.06; 2 = 0.16; 3 = 0.37; 4 = 0.65

Well Information

Well Location: Plant Area 3
Condition of Well: Good condition
Well Completion: Stick-up
Well Locked at Arrival: yes
Well Locked at Departure: yes
Key Number To Well: Code 2502

ft-bmp = feet below measuring point
in = inches
ft = feet
mL/min = milliliters per minute
mS/cm = milliSiemens per centimeter
NTU = Nephelometric Turbidity Unit
mg/L = milligrams per liter
mV = millivolts
°F = degrees Fahrenheit
°C = degrees Celsius

STATE OF TEXAS WELL REPORT for Tracking #628145

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-CSA-GW-01**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 40' 35" N**
		Longitude:	**094° 08' 12.59" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/29/2022** Drilling End Date: **11/29/2022**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8.25	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
13	**25**	**Sand**	**16/30**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete 1 Bags/Sacks**
2	**13**	**Bentonite 6 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**25**	**Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**15**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**15**	**25**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #628146

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-HWSA-SO-01**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-9**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 39' 50.73" N**
		Longitude:	**094° 08' 59.84" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/29/2022** Drilling End Date: **11/29/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8.25**	**0**	**30**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**18**	**30**	**Sand**	**16/30**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**2**	**Concrete 1 Bags/Sacks**
	2	**18**	**Bentonite 8 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**30**	**Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**20**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**20**	**30**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #628147

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-ONFS-GW-01**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 41' 00.56" N**
		Longitude:	**094° 09' 01.81" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/28/2022** Drilling End Date: **11/28/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8.25**	**0**	**35**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**23**	**35**	**Sand**	**16/30**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**2**	**Concrete 1 Bags/Sacks**
	2	**23**	**Bentonite 10 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**29**	**Silty Clay**
29	**35**	**Clay/Shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**25**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**25**	**35**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

STATE OF TEXAS WELL REPORT for Tracking #628140

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-ONFS-SO-01**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 41' 00.56" N**
		Longitude:	**094° 09' 01.81" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/15/2022** Drilling End Date: **11/15/2022**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8.25	**0**	**29**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
7	**29**	**Sand**	**16/30**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete 1 Bags/Sacks**
2	**7**	**Bentonite 3 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**29**	**Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**9**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**9**	**29**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

LHAAP-ONFS-SO-01-111522, LHAAP , 2022-11-15

Created	2022-11-15 17:03:35 UTC by Daniel Luneau
Updated	2022-11-15 21:22:36 UTC by Daniel Luneau
Location	32.683441649424964, -94.1505501419306
Project Number	30001997.40013
Project Site	LHAAP
Project Location	Karnack, TX
Sample Location	LHAAP-ONFS-SO-01
Sample Date	2022-11-15
Field Personnel	Daniel Luneau
Weather	45°F, partly cloudy
Sampling Event	Drilling activities

Analytical Sampling

Sampling Method	Hand Auger
Sample Type	Grab
Sample ID	LHAAP-ONFS-SO-01-111522
Sample Time	11:00

Physical Description

Start Depth (ft)	0
End Depth (ft)	2
Primary Component	Clay
Primary Modifier	with
Secondary Component	Silt

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By	Daniel Luneau

Photos

STATE OF TEXAS WELL REPORT for Tracking #628141

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-ONFS-SO-02**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 40' 59.7" N**
		Longitude:	**094° 09' 01.34" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/15/2022** Drilling End Date: **11/15/2022**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8.25	**0**	**30**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
18	**30**	**Sand**	**16/30**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete 1 Bags/Sacks**
2	**18**	**Bentonite 8 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**30**	**Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**20**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**20**	**30**

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Austin, TX 78711
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LHAAP-ONFS-SO-02-111522, LHAAP , 2022-11-15

Created	2022-11-15 16:05:07 UTC by Daniel Luneau
Updated	2022-11-15 17:05:56 UTC by Daniel Luneau
Location	32.68323847181064, -94.15039591491222
Project Number	30001997.40013
Project Site	LHAAP
Project Location	Karnack, TX
Sample Location	LHAAP-ONFS-SO-02
Sample Date	2022-11-15
Field Personnel	Daniel Luneau
Weather	40-50°F, partly cloudy
Sampling Event	Drilling activities

Analytical Sampling

Sampling Method	Hand Auger
Sample Type	Grab
Sample ID	LHAAP-ONFS-SO-02-111522
Sample Time	08:40
Miscellaneous Notes	Refusal at 30'. Material was dry. Temp well set to wait for water accumulation.

Physical Description

Start Depth (ft)	0
End Depth (ft)	2
Primary Component	Clay
Primary Modifier	with
Secondary Component	Silt
Secondary Modifier	and
Field Moisture	Moist
Sample Color	Light to medium brown
Notes*	Fe nodules and staining. Trace organics present

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By	Daniel Luneau

Photos

STATE OF TEXAS WELL REPORT for Tracking #628142

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-ONFS-SO-03**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 40' 56.67" N**
		Longitude:	**094° 09' 02.64" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/15/2022** Drilling End Date: **11/15/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8.25**	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**13**	**25**	**Sand**	**16/30**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**2**	**Concrete 1 Bags/Sacks**
	2	**13**	**Bentonite 6 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**25**	**Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**15**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**15**	**25**

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Austin, TX 78711
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LHAAP-ONFS-SO-03-111522, LHAAP , 2022-11-15

Created	2022-11-15 21:22:10 UTC by Daniel Luneau
Updated	2022-11-15 21:24:14 UTC by Daniel Luneau
Location	32.6825388, -94.150664
Project Number	30001997.40013
Project Site	LHAAP
Project Location	Karnack, TX
Sample Location	LHAAP-ONFS-SO-03
Sample Date	2022-11-15
Field Personnel	Daniel Luneau
Weather	40°F, cloudy
Sampling Event	Drilling activities

Analytical Sampling

Sampling Method	Hand Auger
Sample Type	Grab
Sample ID	LHAAP-ONFS-SO-03-111522
Sample Time	15:10

Physical Description

Start Depth (ft)	0
End Depth (ft)	2
Primary Component	Clay
Primary Modifier	with
Secondary Component	Silt
Sample Color	Tan and light gray

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By	Daniel Luneau

Photos

STATE OF TEXAS WELL REPORT for Tracking #628143

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-ONFS-SO-04 P.1**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 40' 56.86" N**
		Longitude:	**094° 09' 04.29" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/15/2022** Drilling End Date: **11/15/2022**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**8.25**	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**13**	**25**	**Sand**	**16/30**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**2**	**Concrete 1 Bags/Sacks**
	2	**13**	**Bentonite 6 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**25**	**Silty Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**15**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**15**	**25**

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STATE OF TEXAS WELL REPORT for Tracking #628144

Owner:	**USACE/LHAAP**	Owner Well #:	**LHAAP-ONFS-SO-04 P.2**
Address:	**1310 E Cadron Gap Rd Conway, AR 72032**	Grid #:	**35-23-6**
Well Location:	**Caddo Lake National Wildlife Refuge Karnack, TX**	Latitude:	**32° 40' 56.86" N**
		Longitude:	**094° 09' 04.29" W**
Well County:	**Harrison**	Elevation:	**No Data**
Type of Work:	**New Well**	Proposed Use:	**Monitor**

Drilling Start Date: **11/28/2022** Drilling End Date: **11/28/2022**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8.25	**0**	**45**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
23	**45**	**Sand**	**16/30**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**2**	**Concrete 1 Bags/Sacks**
2	**23**	**Bentonite 11 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Envirotech Drilling Services LLC**

PO BOX 19064
Houston, TX 77224

Driller Name: **Jaime Vasquez** License Number: **58171**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**25**	**Silty Clay**
25	**45**	**Clay/Shale**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**0**	**25**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**25**	**45**

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Austin, TX 78711
(512) 334-5540

LHAAP-ONFS-SO-04-111522, LHAAP , 2022-11-15

Created	2022-11-16 02:43:26 UTC by Daniel Luneau
Updated	2022-11-16 02:44:47 UTC by Daniel Luneau
Location	32.4901952, -94.3532627
Project Number	30001997.40013
Project Site	LHAAP
Project Location	Karnack, TX
Sample Location	LHAAP-ONFS-SO-04
Sample Date	2022-11-15
Field Personnel	Daniel Luneau
Sampling Event	Drilling activities

Analytical Sampling

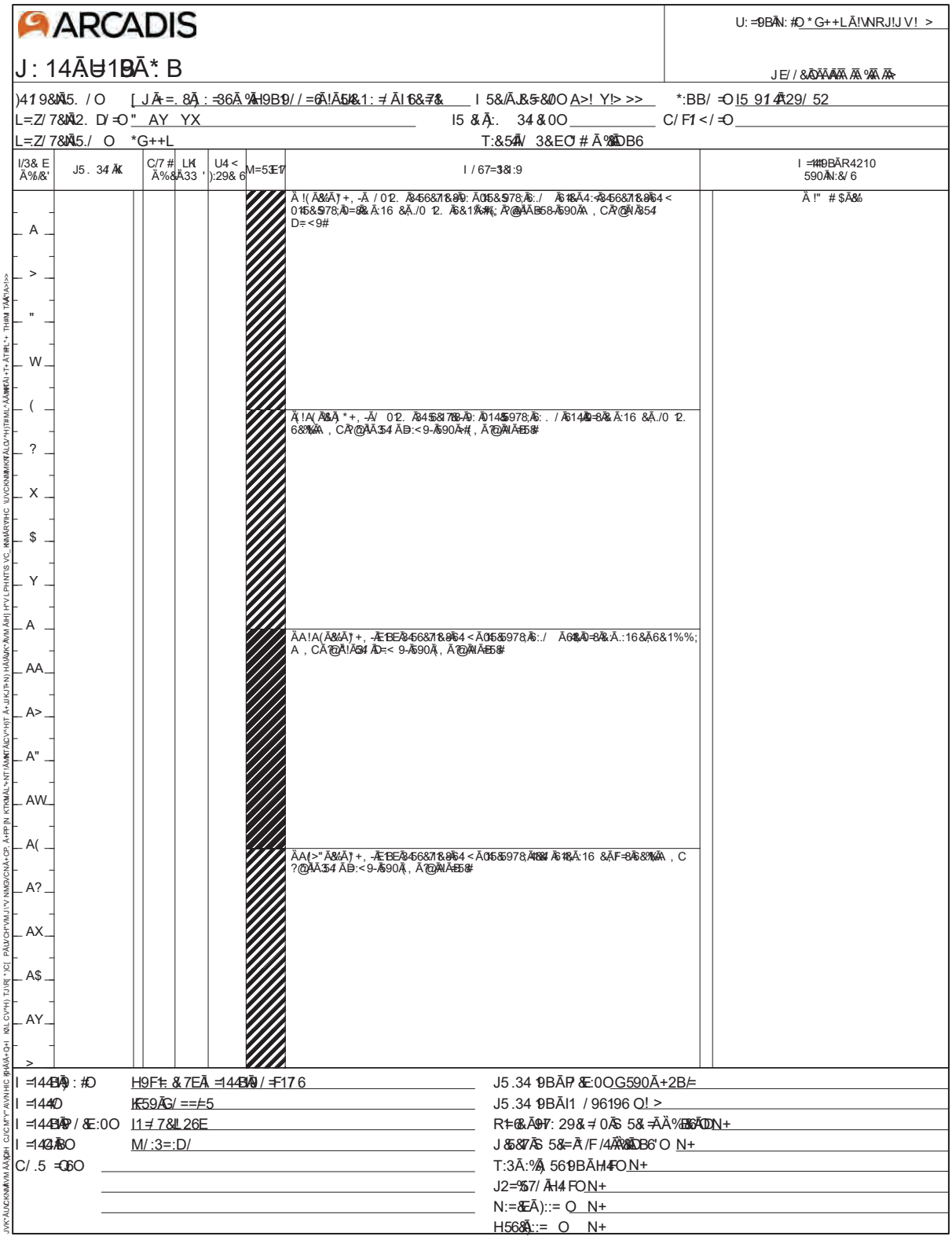
Sampling Method	Hand Auger
Sample Type	Grab
Sample ID	LHAAP-ONFS-SO-04-111522
Sample Time	16:30

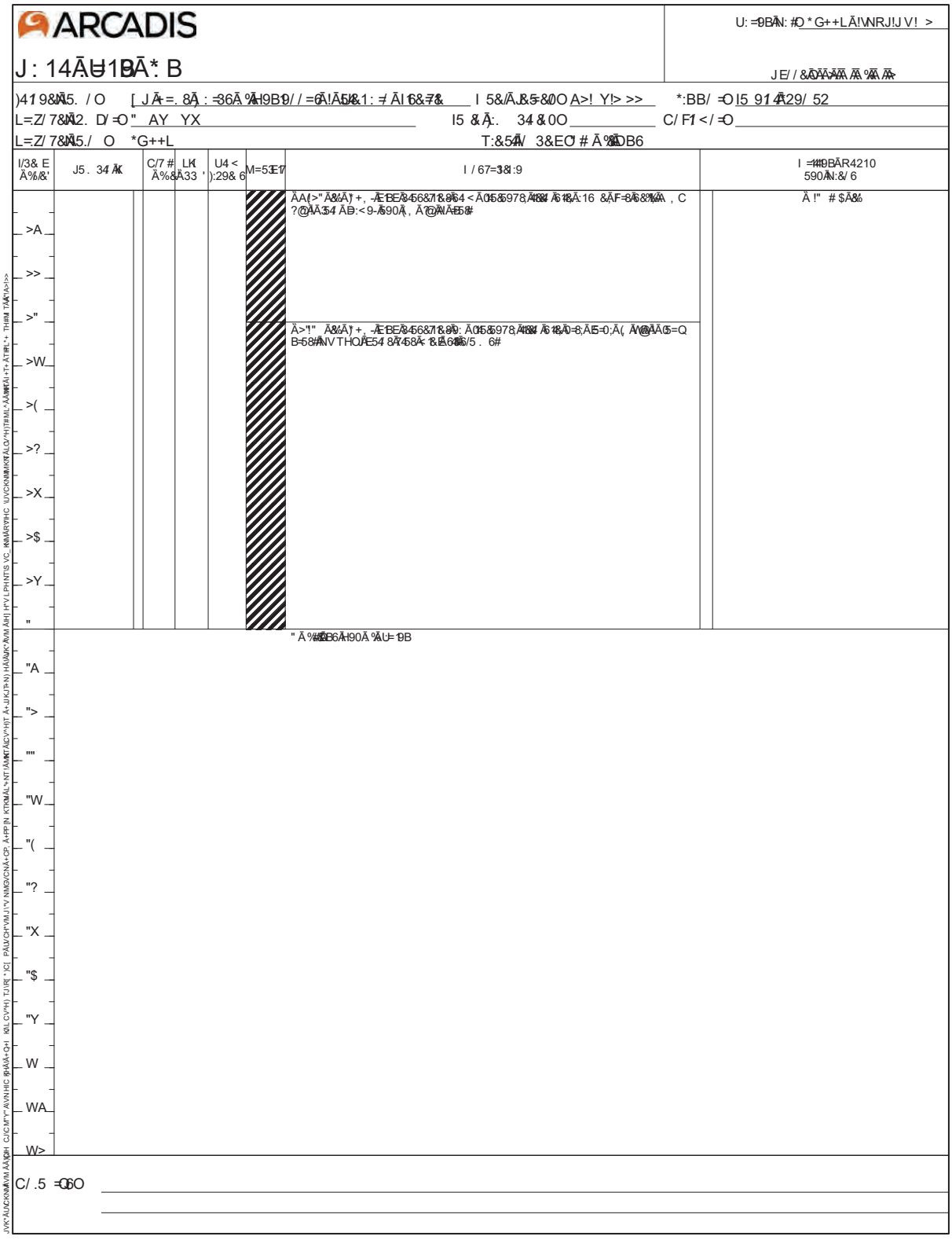
Physical Description

Start Depth (ft)	0
End Depth (ft)	2
Primary Component	Clay
Primary Modifier	with
Secondary Component	Silt
Sample Color	Tan and light gray

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By	Daniel Luneau
Photos	





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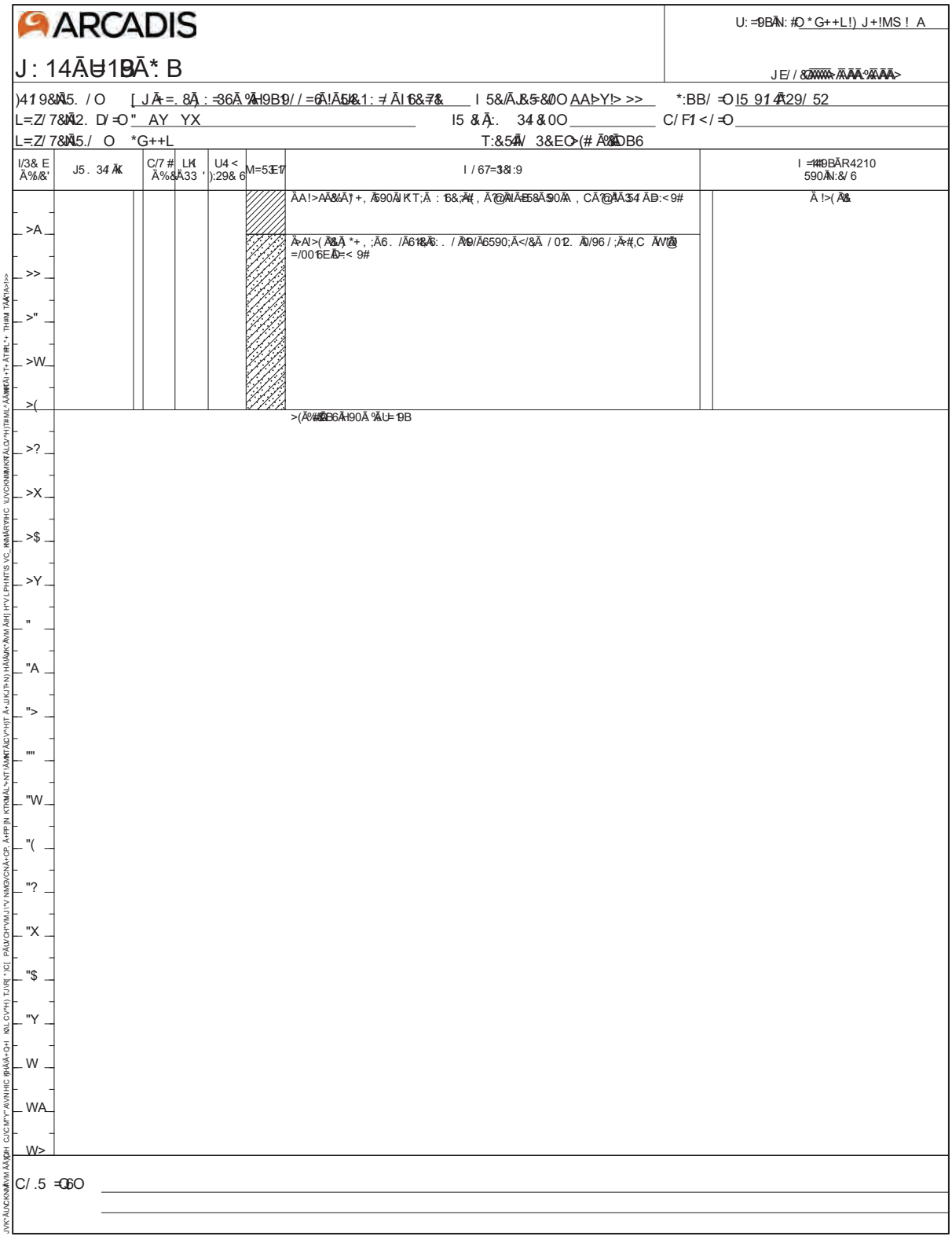

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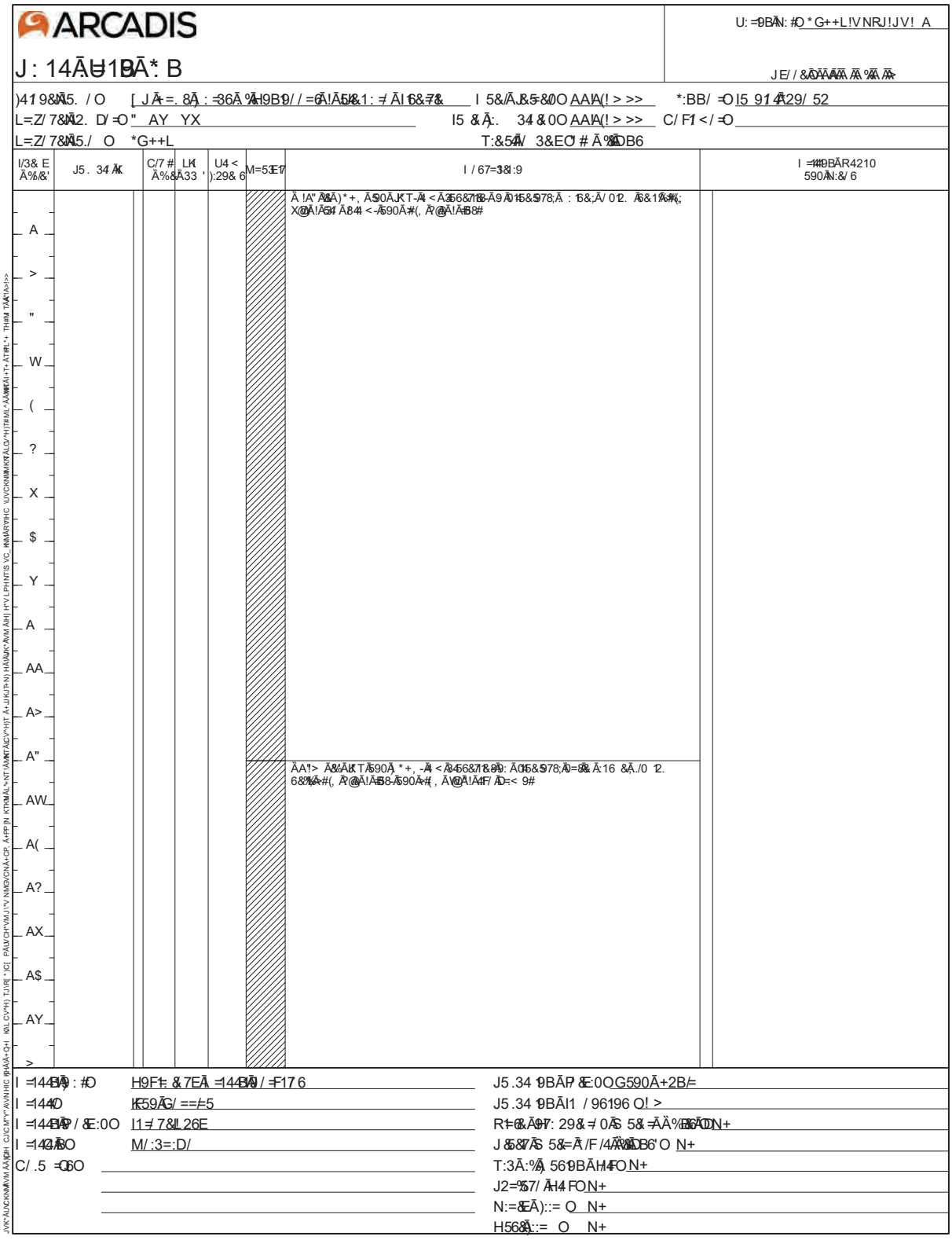
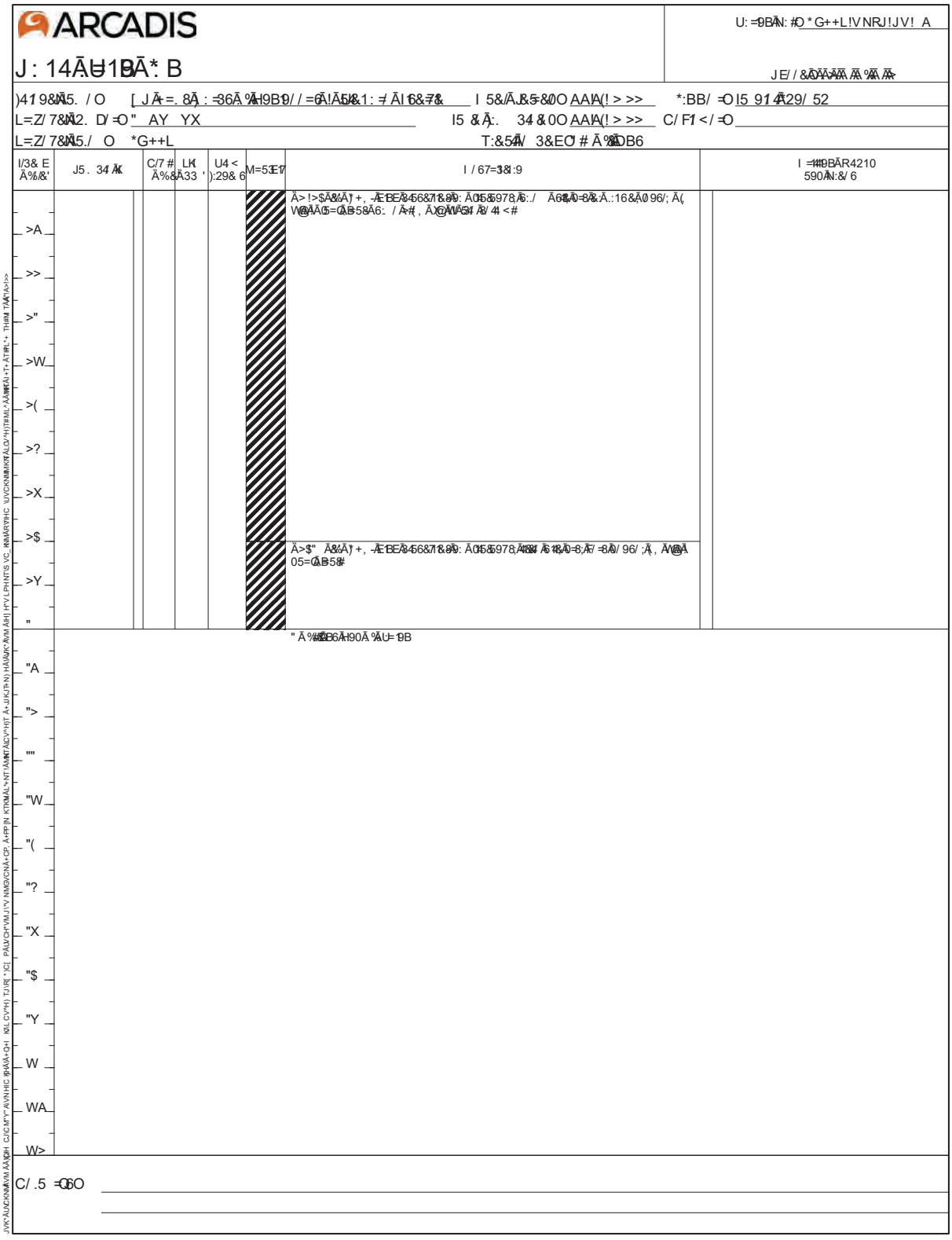
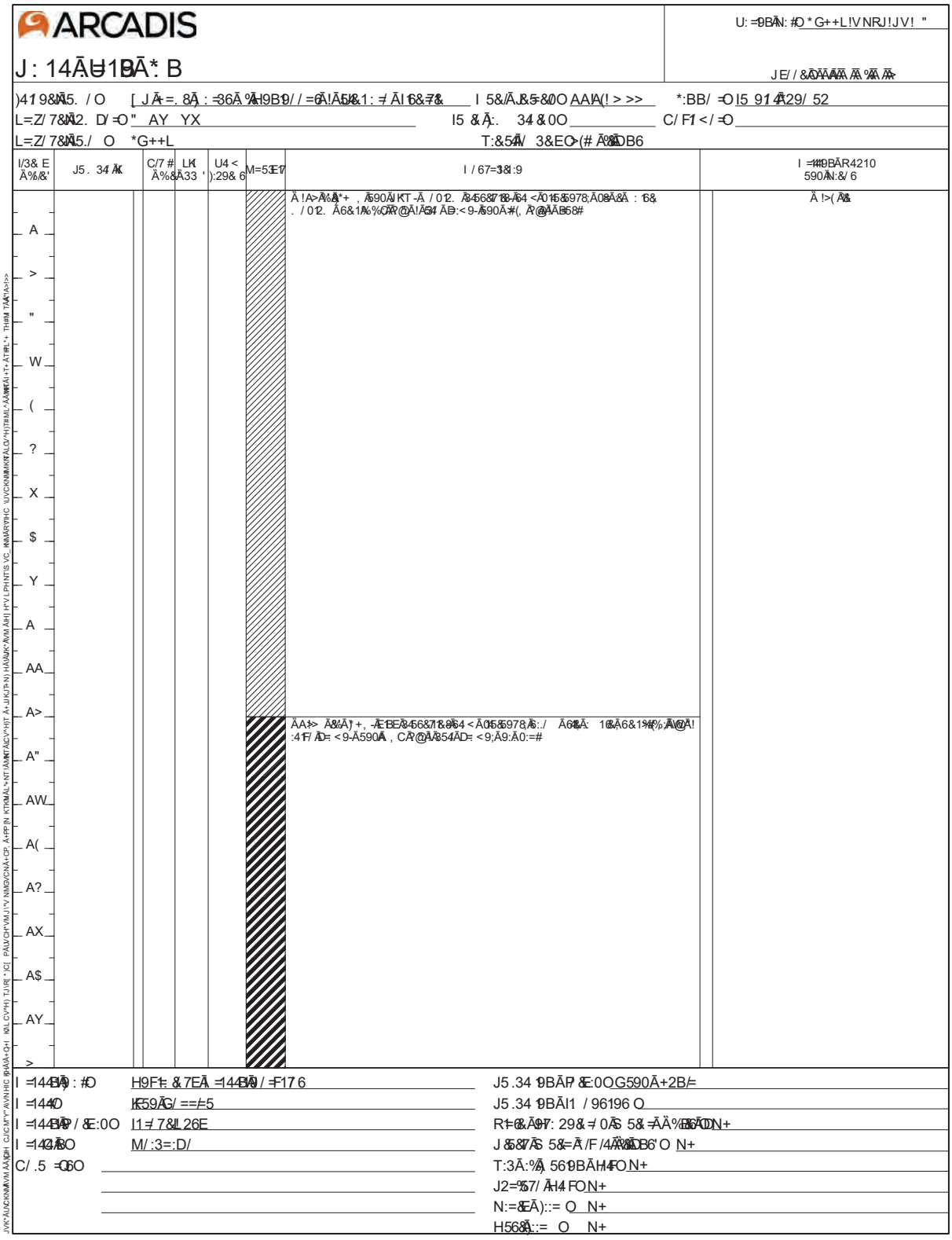
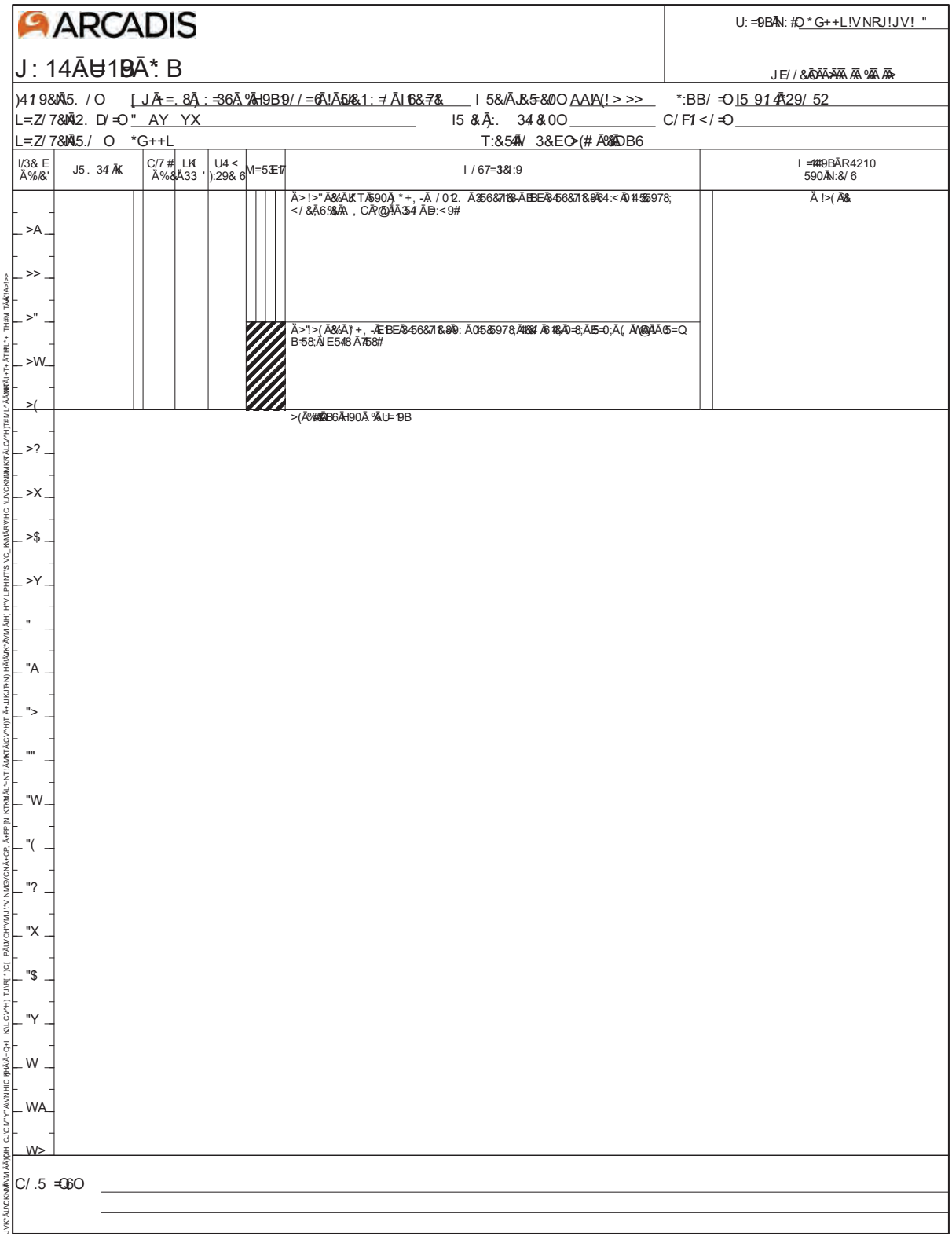
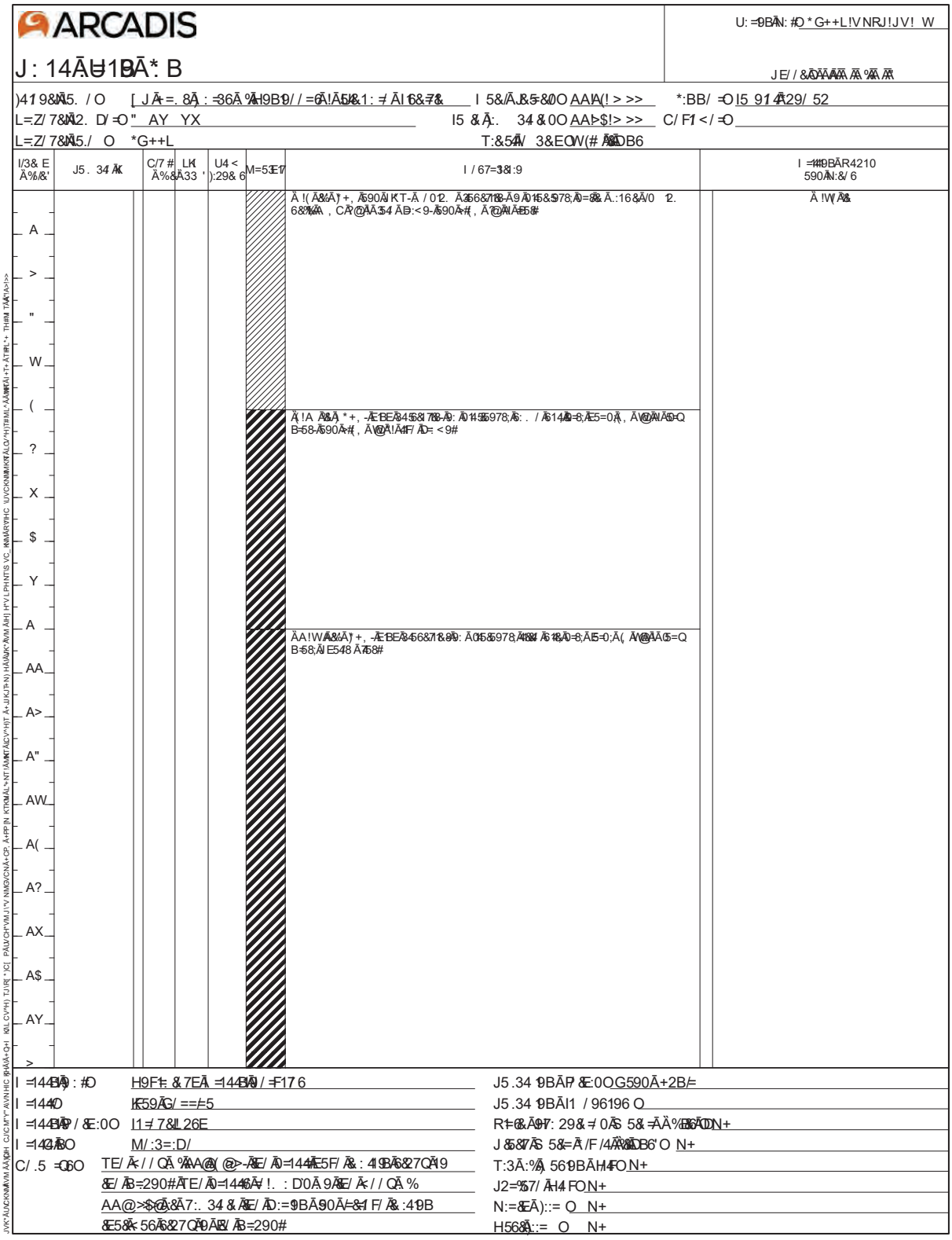
JVK^ÃUCKNMÃVMÃÃKQH CJG:M*Y^ AVNHIC @HÃÃ+QH KQLCV^H) TJ!R[*)C[PÃUVGHVWJ!V NMGXGNA+CP; A+PPJN KTRNÃL+NT!ÃMKTÃGV^H!T Ã+JJKJ!+N) HAÃMXC^MÃ!H] H*VLPHNTS VC_KMMARVPHC UVCKNMKRTÃLQ^H)TIML*ÃÃMKTÃA+T+ÃT!L*+ THMM TÃ^A>!>>

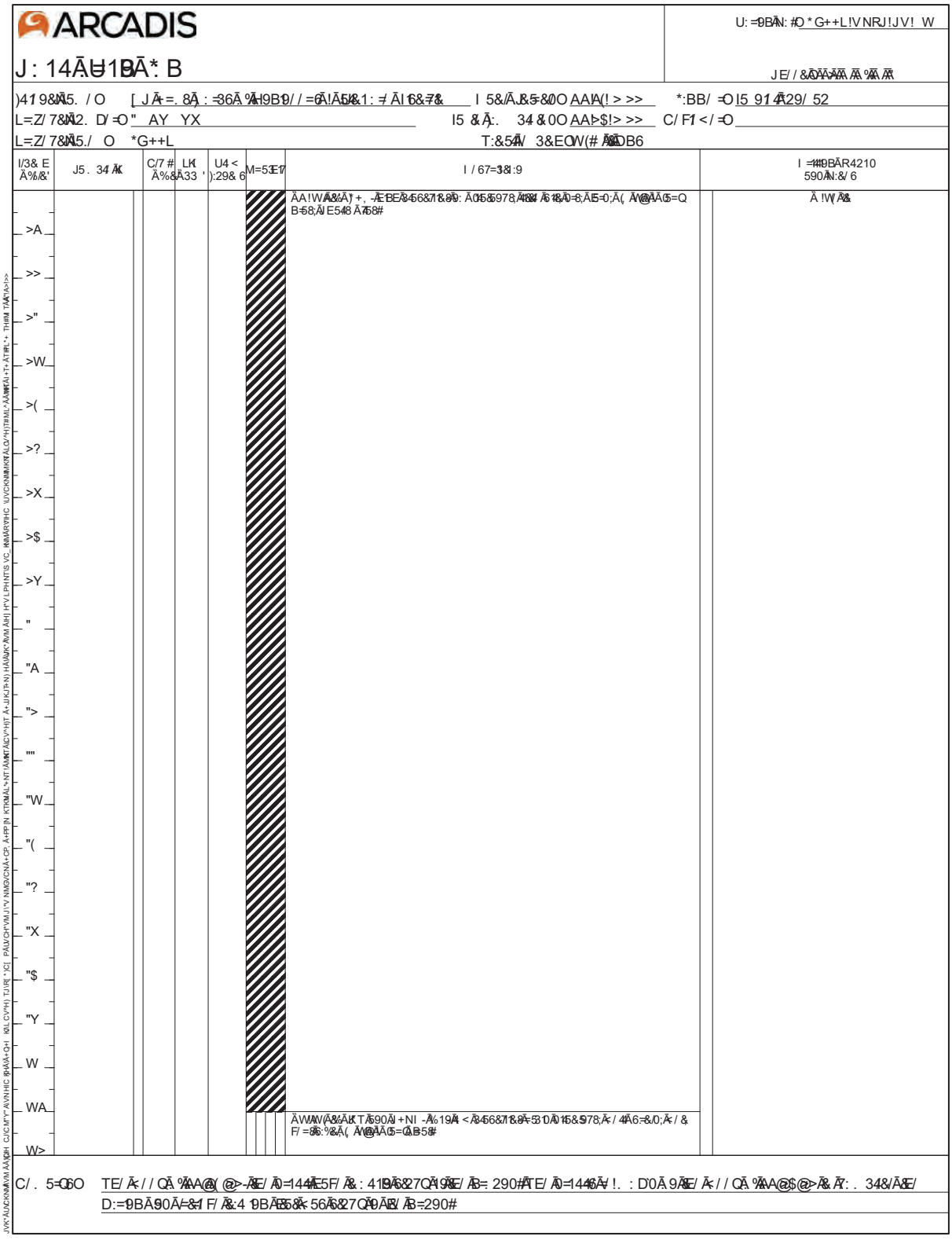












ARCADIS

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01189593

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997.40013	**Sample Location:**	LHAAP-ONFS-SO-02	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, TX	**Personnel:**	Daniel Luneau
Weather:	40-50°F, partly cloudy	**Sampling Event:**	Drilling activities		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Grab	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-ONFS-SO-02-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Refusal at 30'. Material was dry. Temp well set to wait for water accumulation.				
		EB Description:	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
N/A	N/A	N/A	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

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PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Light to medium brown
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	Fe nodules and staining. Trace organics present		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Daniel Luneau

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997.40013	**Sample Location:**	LHAAP-ONFS-SO-01	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, TX	**Personnel:**	Daniel Luneau
Weather:	45°F, partly cloudy	**Sampling Event:**	Drilling activities		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Grab	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-ONFS-SO-01-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
N/A	N/A	N/A	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

0

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	N/A
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	N/A
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Daniel Luneau

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997.40013	**Sample Location:**	LHAAP-ONFS-SO-03	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, TX	**Personnel:**	Daniel Luneau
Weather:	40°F, cloudy	**Sampling Event:**	Drilling activities		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Grab	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-ONFS-SO-03-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	15:10	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
N/A	N/A	N/A	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

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PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	N/A
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan and light gray
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Daniel Luneau

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997.40013	**Sample Location:**	LHAAP-ONFS-SO-04	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, TX	**Personnel:**	Daniel Luneau
Weather:		**Sampling Event:**	Drilling activities		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Grab	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-ONFS-SO-04-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	16:30	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
N/A	N/A	N/A	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

0

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	N/A
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan and light gray
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Daniel Luneau

01189597

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-03	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cold	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-03-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	16:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Located on the southern corner in ditching	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Very coarse sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
(with Descriptors):	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Andrew Parker

01189598

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-01	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cold	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-01-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	16:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Located on the southern corner in ditching	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Andrew Parker

01189599

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997.40013	**Sample Location:**	LHAAP-PA2-SO-02	**Date:**	11/17/2022
Site:	LHAAP	**Location:**	Karnack, TX	**Personnel:**	Daniel Luneau
Weather:	40-50°F, clear	**Sampling Event:**	Drilling activities		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Grab	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-02-111722	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	15:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
N/A	N/A	N/A	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

0

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Brown
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Daniel Luneau

01189600

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP–VWR-SO-01	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP–VWR-SO-01-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:50	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	2	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

2

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP–ONFS–SO-06	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP–ONFS–SO-06-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Moved sample flag	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	2	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

2

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Non-plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189602

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP–ONFS–SO-05	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP–ONFS–SO-05-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Moved flag 5 feet closer to drainage area	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	2	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

2

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Non-plastic; Stickiness:N/A
(with Descriptors):	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189603

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-VWR–SO-02	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	Yes		
Sample Type:	Composite	**Duplicate:**	Yes	**If Yes, Sample Time:**	09:45
Sub-Samples:	N/A	**Duplicate ID:**	LHAAP-VWR-DUP-SO-02		
Sample ID:	LHAAP-VWR–SO-02-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	MS/MSD and DUP	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: some Gravel; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189604

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-09	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-09-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	12:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	Moved Flag to ditch for closer drainage location		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-08	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-08-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	13:10	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Very fine sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Non-plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	Moved Flag to ditch for closer drainage location		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189606

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-10	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-10-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	13:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Reddish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	Moved Flag to ditch for closer drainage location		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-12	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-12-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:30	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Clay; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark brownish gray
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	Moved Flag to ditch for closer drainage location		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-01	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	Yes		
Sample Type:	Composite	**Duplicate:**	Yes	**If Yes, Sample Time:**	09:00
Sub-Samples:	N/A	**Duplicate ID:**	LHAAP-PA3-DUP-01		
Sample ID:	LHAAP-PA3-SO-01-110822	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Grayish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189609

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-02-110922	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-02	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Grayish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-03	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-03-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Light Grayish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189611

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-05	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-05-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:20	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Light Grayish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189612

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-06	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-06-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Grayish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189613

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-11	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-11-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	13:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Sand; Tertiary: and Clay	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189614

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-04	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-04-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	14:10	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Sand; Tertiary: and Clay	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189615

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-FWDF-SO-02	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-FWDF-SO-02-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	14:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Snakes present, saved sample for 11/10	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Fine sand; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
(with Descriptors):	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish dark brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-FWDF-SO-03	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid sunny	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-FWDF-SO-03-110922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	15:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Fine sand; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-BG3-SO-05	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-BG3-SO-05-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:50	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish dark brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189618

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-BG3-SO-03	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-BG3-SO-03-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: some Very fine sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan reddish dark brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-BG3-SO-02	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-BG3-SO-02-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:55	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark brown with buff
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189620

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-BG3-SO-01	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-BG3-SO-01-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Reddish tan
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189621

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-BG3-SO-04	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-BG3-SO-04-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark tan , light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189622

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-12	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-12-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	14:25	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Very fine sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark tan , light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189623

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-13	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-13-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	14:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: with Silt; Tertiary: and Clay	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark tan
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189624

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-01	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-02-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	15:50	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark brown, light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	Sample also taken by Daniel Luneau 11/17		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189625

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-FWDF-SO-01	**Date:**	11/9/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-FWDF-SO-01-111122	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Snakes present, saved sample for 11/11. Rocks in area and on slope near drainage. Depth only 1.5 feet achieved				
		EB Description:	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189626

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-07	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-07-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	14:05	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark tan , light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189627

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-01	**Date:**	11/10/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-01-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	15:20	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: with Silt; Tertiary: and Clay	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Dark brown, light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189628

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-03	**Date:**	11/11/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-03-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:05	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan, light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189629

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-04	**Date:**	11/11/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-04-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan, light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189630

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-05-111522	**Date:**	11/11/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-05	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: with Sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
(with Descriptors):	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan, grayish light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189631

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-06	**Date:**	11/11/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-06-111022	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	13:20	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture,PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: with Sand; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan & light brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-HWSA—SO-01	**Date:**	11/12/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Cold overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-HWSA—SO-01-111222	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: and Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Light brownish tan with some red
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189633

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-HWSA—SO-02	**Date:**	11/12/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Cold overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-HWSA—SO-02-11122	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:15	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	Had to move to better placement in ditching	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS,Particle Size D422-63(2007),TOC / pH	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: and Clay; Tertiary: with Gravel	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Light brownish tan with reddish
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189634

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-HWSA—SO-03	**Date:**	11/12/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Cold overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-HWSA—SO-03-111222	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:30	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Dry
Principal Components (with Descriptors):	Primary: Silt; Secondary: and Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:Loose; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Light brownish tan
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	Plastic where is plasticity option		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA3-SO-07	**Date:**	11/8/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Humid overcast	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-07-111422	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:55	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
Moisture ,PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Very fine sand; Secondary: some Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189636

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-VWR-SO-03	**Date:**	11/14/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cloudy	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-VWR-SO-03-111422	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:40	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	N/A
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-CAS-SO-01	**Date:**	11/14/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cloudy	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-CAS-SO-01-111422	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:35	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Dry
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:Slightly Hard; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan brown
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-CAS-SO-02	**Date:**	11/14/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cloudy	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	Yes		
Sample Type:	Composite	**Duplicate:**	Yes	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	L HAAP-CAS-SO-DUP01		
Sample ID:	LHAAP-CSA-SO-02-111422	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	10:50	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189639

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-CAS-SO-3	**Date:**	11/14/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cloudy	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-CAS-SO-3-111422	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	11:45	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: some Very fine sand	**(with Descriptors):**	Consistency:N/A; Plasticity:Slightly Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan brown and dark brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189640

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-05	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cold	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-05-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:20	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	New coordinate	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125 ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Dry
Principal Components (with Descriptors):	Primary: Silt; Secondary: with Clay; Tertiary: N/A	**(with Descriptors):**	Consistency:Soft; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish brown
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189641

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	LHAAP-PA2-SO-04	**Date:**	11/15/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Overcast cold	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA2-SO-04-111522	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	09:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	New coordinate	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Very Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	N/A
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Lyndsey DeRamus

01189642

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997.40013	**Sample Location:**	LHAAP-HWSA-SO-01	**Date:**	11/29/2022
Site:	LHAAP	**Location:**	Karnack, TX	**Personnel:**	Daniel Luneau
Weather:	70°F, cloudy	**Sampling Event:**	Drilling activities		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Grab	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	pH, TOC, grain size	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-HWSA-SO-01-112922	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	08:20	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	125ml HDPE	1	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

1

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Moist
Principal Components (with Descriptors):	Primary: Clay; Secondary: with Silt; Tertiary: trace Fine sand	**(with Descriptors):**	Consistency:N/A; Plasticity:N/A; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tan and reddish brown
Sorting:	N/A	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Daniel Luneau

01189643

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	PA3	**Date:**	11/28/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Sunny	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	Yes		
Sample Type:	Composite	**Duplicate:**	Yes	**If Yes, Sample Time:**	14:03
Sub-Samples:	N/A	**Duplicate ID:**	LHAAP-DUP01-112822		
Sample ID:	LHAAP-PA3-SO-01	**Equipment Blank:**	No	**If Yes, Sample Time:**	N/A
Sample Time:	14:00	**Equipment Blank ID:**	N/A	**Lot #:**	N/A
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS,Particle Size D422-63(2007),TOC / pH,Total Organic Carbon and pH	250 mL HDPE	4	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

4

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Clay; Secondary: N/A; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Very Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish grey
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Andrew Parker

01189644

ARCADIS

SHALLOW SOIL SAMPLING LOG

Project Number:	30001997	**Sample Location:**	PA3	**Date:**	11/28/2022
Site:	LHAAP	**Location:**	Karnack, Texas	**Personnel:**	AP,LD
Weather:	Sunny	**Sampling Event:**	Soil		

ANALYTICAL SAMPLING

Sampling Method:	Hand Auger	**MS/MSD:**	No		
Sample Type:	Composite	**Duplicate:**	No	**If Yes, Sample Time:**	N/A
Sub-Samples:	N/A	**Duplicate ID:**	N/A		
Sample ID:	LHAAP-PA3-SO-04	**Equipment Blank:**	Yes	**If Yes, Sample Time:**	16:00
Sample Time:	15:25	**Equipment Blank ID:**	LHAAP-EB-2-112822	**Lot #:**	2
Miscellaneous Notes:	N/A	**EB Description:**	N/A		
		Source Blank:	No	**If Yes, Sample Time:**	N/A
		Source Blank ID:	N/A	**Lot #:**	N/A

SAMPLE INFORMATION

Analyses:	Container:	No.	Preservative*:
PFAS	250 mL HDPE	4	None

*All bottles should be cooled as soon as possible to ≤ 6°Celsius.

4

PHYSICAL DESCRIPTION

Depth Interval:	0 - 2	**Field Moisture:**	Wet
Principal Components (with Descriptors):	Primary: Clay; Secondary: N/A; Tertiary: N/A	**(with Descriptors):**	Consistency:N/A; Plasticity:Very Plastic; Stickiness:N/A
	Angularity: N/A; Dilatancy: N/A	**Color (Munsell Chart):**	Tannish grey
Sorting:	Well sorted	**Geologic Origin:**	N/A
Notes*	N/A		

*i.e., odor, stratigraphy, structure, sphericity, cementation, reaction to acid.

Logged By: Andrew Parker

APPENDIX J

Site Inspection Photo Log

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 1

Date: 11-09-2022

Description: Well LHSMW25

Location:
Plant Area 2

Direction:
West

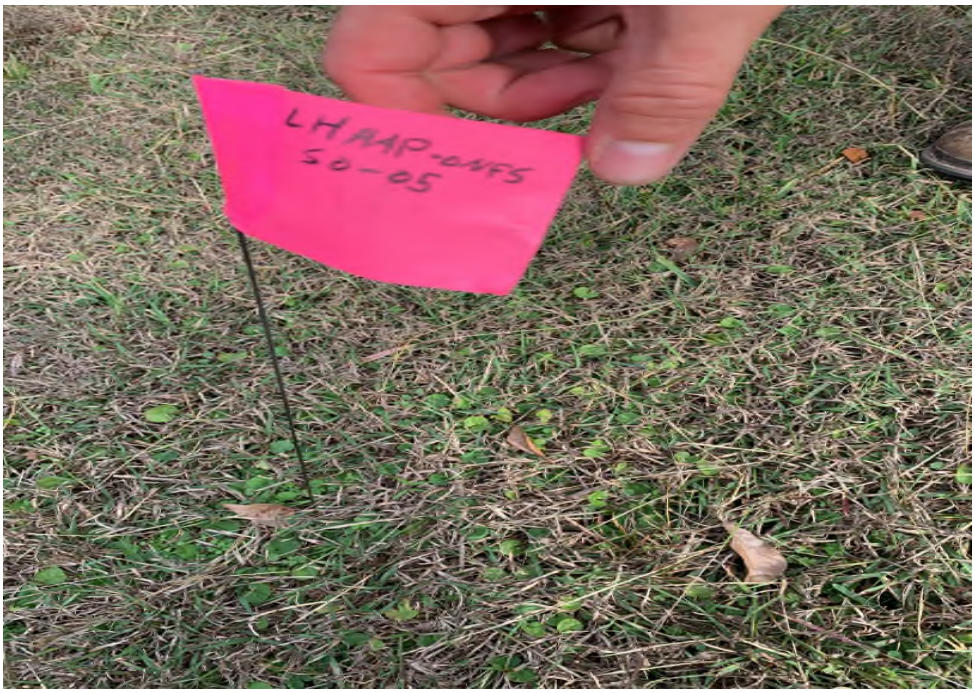


Photo: 2

Date: 11-07-2022

Description:
LHAAP -ONFS SO-05

Location:

Old New Fire Station

Direction:
Northeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 3

Date: 11-07-2022

Description:
LHAAP-ONFS-GW-03

Location:
New Fire Station

Direction:
South

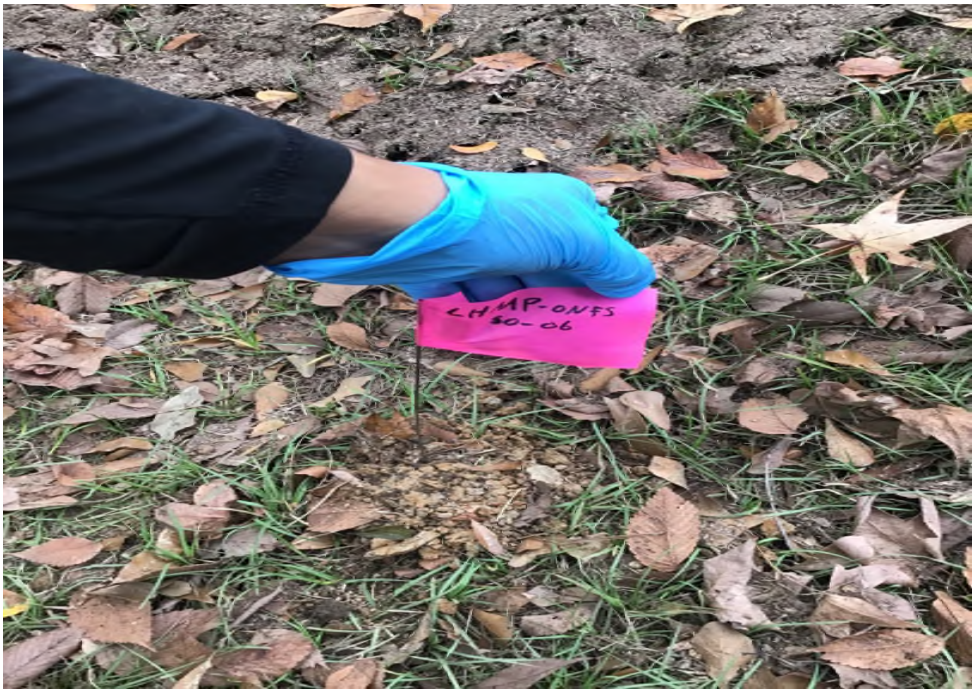


Photo: 4

Date: 11-08-2022

Description:
LHAAP-ONFS-SO-06

Location:
Old New Fire Station

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 5

Date: 11-08-2022

Description:
LHAAP-ONFS-SO-06

Location:
Old New Fire Station

Direction:
South

Photo: 6

Date: 11-08-2022

Description:
Photo of well 04WW08. Well is located southwest of Former Brine Tank.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW08

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 7

Date: 11-08-2022

Description:
Photo taken facing south into the Former Plant Area 3.

Location:
Plant Area 3 - Well 47WW49

Direction:
South

Photo: 8

Date: 11-08-2022

Description:
Front view of well 47WW48, facing southwest into the woods.

Location:
Plant Area 3 - Well 47WW48

Direction:
Southwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 9

Date: 11-08-2022

Description:
Photo of well 04WW01, located southwest of the Former Pilot Wastewater Treatment Plant.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW02

Direction:
South

Photo: 10

Date: 11-08-2022

Description:
Photo of monitoring well 04WW07

Location:
Former Pilot Wastewater Treatment Plant -Well 04WW07

Direction:
Northwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 11

Date: 11-08-2022

Description:
Photos show remnants of Plant Area 3. Former fire hydrants seem to be abondoned here.

Location:
Plant Area 3 - Well 35BWW23

Direction:
South

Photo: 12

Date: 11-08-2022

Description:
Well is surrounded by woods. It is centrally located in Plant Area 2.

Location:
Plant Area 2 - LHSMW18

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 13

Date: 11-08-2022

Description:
Well surrounded by former buildings.

Location:
Plant Area 2 - LHSMW19

Direction:
North

Photo: 14

Date: 11-08-2022

Description:
Well is located near a former training course.

Location:
Plant Area 3 - Well LHSMW50

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 15

Date: 11-08-2022

Description:
Well is surrounded by former buildings.

Location:
Plant Area 2 - 46WW11

Direction:
North

Photo: 16

Date: 11-08-2022

Description:
Well is surrounded by woods.

Location:
Plant Area 2 -Well 46WW06

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 17

Date: 11-08-2022

Description:
Well area is surrounded by woods.

Location:
Plant Area 3 - 35BWW07

Direction:
South

Photo: 18

Date: 11-08-2022

Description:
Photo of monitoring well LHSMW01.

Location:
Old and New Fire Stations -Well LHSMW01

Direction:
Northwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 19

Date: 11-09-2022

Description:
Well is in a area where remnants of buildings remain.

Location:
Plant Area 3 - LHSMW41

Direction:
Northeast

Photo: 20

Date: 11-09-2022

Description:
Well is located slightly lower than the road. Road can be accessed south of the well.

Location:
Plant Area 3 - LHSMW44

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 21

Date: 11-09-2022

Description:
Well is located around overgrown hay.

Location:
Old Landfill - well 16WW38

Direction:
North

Photo: 22

Date: 11-09-2022

Description:
Well is located behind a tree coming from the north access road. Area is very vegetated.

Location:
Old Landfill - well 16WW13

Direction:
Northeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 23

Date: 11-09-2022

Description:
Well is located on a sub road behind a bush.

Location:
Former Waste Disposal Facility - well 50WW08

Direction:
West

Photo: 24

Date: 11-09-2022

Description:
Photo of well 50WW13.

Location:
Former Waste Disposal Facility - well 50WW13

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 25

Date: 11-09-2022

Description:
Well is located further east from well 50WW13. It is located behind a bush. Car access may be possible.

Location:
Former Waste Disposal Facility -well 50WW12

Direction:
East

Photo: 26

Date: 11-09-2022

Description:
Well is located in area where there a bunch of wells. Pink flag and pink markers on the floor have been placed to help locate well.

Location:
Old Landfill - well 16WW36

Direction:
Southwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 27

Date: 11-08-2022

Description:
Photo facing well 46WW09.

Location:
Plant Area 2 - 46WW09

Direction:
West

Photo: 28

Date: 11-08-2022

Description:
LHAAP soil boring (DPT)

Location:
LHAAP-ONFS-GW02

Direction:
Northeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 29

Date: 11-09-2022

Description:
Well located off a grass/dirt road south of the storage tank.

Location:
Old Landfill - well 16WW16

Direction:
North

Photo: 30

Date: 11-12-2022

Description:
Haz Waste Area

Location:
LHAAP-HWSA-SO-03

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 31

Date: 11-12-2022

Description:
Haz Waste Area

Location:
LHAAP-HWSA-SO-03

Direction:
South

Photo: 32

Date: 11-30-2022

Description:
GW WELL 47WW19

Location:
PA3

Direction:
Northwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 33

Date: 11-30-2022

Description:
GW WELL 47WW19

Location:
PA3

Direction:
Northwest

Photo: 34

Date: 11-30-2022

Description:
WELL 46WW02

Location:
PA2

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 35

Date: 11-30-2022

Description:
WELL 46WW02

Location:
PA2

Direction:
Southeast

Photo: 36

Date: 11-30-2022

Description:
WELL 46WW02

Location:
PA2

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 37

Date: 11-10-2022

Description:
Sampling soil in Burning grounds

Location:
LHAAP-BG3-SO-05

Direction:
West

Photo: 38

Date: 11-10-2022

Description:
Sampling soil in Burning grounds

Location:
LHAAP-BG3-SO-05

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 39

Date: 11-11-2022

Description:
LHAAP-FWDF-SO-01

Location:
Forner Waste Disposal Facility

Direction:
NA

Photo: 40

Date: 11-11-2022

Description:
LHAAP-FWDF-SO-01

Location:
Forner Waste Disposal Facility

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 41

Date: 11-14-2022

Description:
LHAAP-PA3-SO-07

Location:
Plant Area 3

Direction:
NA

Photo: 42

Date: 11-14-2022

Description:
LHAAP-PA3-SO-07

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 43

Date: 11-15-2022

Description:
LHAAP-PA2-SO-04—111522

Location:
Plant Area 2

Direction:
NA

Photo: 44

Date: 11-09-2022

Description:
LHAAP-PA3-SO-12

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 45

Date: 11-10-2022

Description:
Well conditions MW-23

Location:
Burning Ground 3

Direction:
South

Photo: 46

Date: 11-10-2022

Description:
Well condition and location of well LHSMW24.

Location:
Plant Area 2 - well LHSMW24

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 47

Date: 11-08-2022

Description:
LHAAP soil boring (DPT)

Location:
LHAAP-ONFS-GW02

Direction:
Northeast

Photo: 48

Date: 11-10-2022

Description:
Well location and condition of well 35AWW16.

Location:
Vehicle Wash Rack - well 36AWW16

Direction:
Southwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 49

Date: 11-10-2022

Description:
Well location and condition of well LHSMW56R.

Location:
Plant Area 3 - well LHSMW56R

Direction:
Southeast

Photo: 50

Date: 11-09-2022

Description:
Well LHSMW25 access was marked.

Location:
Plant Area 2

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 51

Date: 11-08-2022

Description:
LHAAP-ONFS-SO-05 moved to drainage closer

Location:
Old New Fire Station

Direction:
South

Photo: 52

Date: 11-07-2022

Description:
LHAAP-ONFS-GW-04

Location:
New Fire Station

Direction:
Northwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 53

Date: 11-08-2022

Description:
Photo taken facing west towards Former Storage Tank and Former Settling Tank.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW08

Direction:
West

Photo: 54

Date: 11-08-2022

Description:
Photo taken facing west towards Former Storage Tank and Former Settling Tank.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW08

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 55

Date: 11-08-2022

Description:
Area of Old Fire Station from well viewpoint.

Location:
Old and New Fire Stations -Well LHSMW01

Direction:
East

Photo: 56

Date: 11-08-2022

Description:
Photo facing towards inner Plant Area 3.

Location:
Plant Area 3 - Well LHSMW50

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 57

Date: 11-08-2022

Description:
Former structure located west of the well.

Location:
Plant Area 3 - Well 47WW49

Direction:
West

Photo: 58

Date: 11-08-2022

Description:
Former structure located north of the well.

Location:
Plant Area 3 - Well 47WW48

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 59

Date: 11-08-2022

Description:
Photo facing towards Former Pilot Wastewater Treatment Plant.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW02

Direction:
North

Photo: 60

Date: 11-08-2022

Description:
Photo facing towards the road. Drainage ditch is surrounding the well area.

Location:
Former Pilot Wastewater Treatment Plant -Well 04WW07

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 61

Date: 11-08-2022

Description:
Facing inner to Plant Area 3. Ditch located on right side of photo.

Location:
Plant Area 3 - Well 35BWW23

Direction:
East

Photo: 62

Date: 11-08-2022

Description:
Well area surrounded by woods.

Location:
Plant Area 3 - 35BWW07

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 63

Date: 11-08-2022

Description:
Road access is south of the well. To access road Travel two hundred yards southwest along the concrete road. Turn left and take another left. Then drive back north up to the well.

Location:
Plant Area 2 - LHSMW18

Direction:

Photo: 64

Date: 11-08-2022

Description:
Well surrounded by former buildings to the east and west.

Location:
Plant Area 2 - LHSMW19

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 65

Date: 11-08-2022

Description:
Well is surrounded by former buildings to the east and west.

Location:
Plant Area 2 - 46WW11

Direction:
West

Photo: 66

Date: 11-08-2022

Description:
Well can be accessed from the north road.

Location:
Plant Area 2 -Well 46WW06

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 67

Date: 11-09-2022

Description:
Road access is south of the well.

Location:
Plant Area 3 - LHSMW41

Direction:
South

Photo: 68

Date: 11-09-2022

Description:
Building remnants remain in the area.

Location:
Plant Area 3 - LHSMW44

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 69

Date: 11-09-2022

Description:
Driveway can be accessed from a path located before or after the well.

Location:
Old Landfill - well 16WW38

Direction:
Northwest

Photo: 70

Date: 11-09-2022

Description:
Road access can be found northwest or southwest of the well.

Location:
Old Landfill - well 16WW16

Direction:
Northwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 71

Date: 11-09-2022

Description:
Well is marked yellow and is located inside the woods. Driving is possible from multiple sides. Pink flags and pink marks on the floor have been placed to help locate well.

Location:
Old Landfill - well 16WW36
Direction:
Northeast

Photo: 72

Date: 11-09-2022

Description:
Well is located behind the two trees/brush between the two pink flags. The pink flags have been placed to help locate the wells.

Location:
Old Landfill - well 16WW13

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 73

Date: 11-09-2022

Description:
Photo taken of well from the subroad.

Location:
Former Waste Disposal Facility - well 50WW08

Direction:
Northwest

Photo: 74

Date: 11-09-2022

Description:
Photo of well location taken from the road.

Location:
Former Waste Disposal Facility - well 50WW13

Direction:
Northeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 75

Date: 11-08-2022

Description:
Former walkways and foundations are found near the well.

Location:
Plant Area 2 - 46WW09

Direction:
East

Photo: 76

Date: 11-07-2022

Description:
LHAAP-ONFS-SO-06

Location:
Avenue P and 6th street across from firehouse

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 77

Date: 11-07-2022

Description:
LHAAP-ONFS-SO-06

Location:
Avenue P and 6th street across from firehouse

Direction:
East

Photo: 78

Date: 11-11-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-03

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 79

Date: 11-12-2022

Description:
LHAAP-HWSA-SO-01

Location:
Hazardous Waste Storage Area

Direction:
NA

Photo: 80

Date: 11-09-2022

Description:
LHAAP-PA3-SO-01

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 81

Date: 11-10-2022

Description:
Well location and condition of well 47WW42.

Location:
Plant Area 3 - well 47WW42

Direction:
West

Photo: 82

Date: 11-10-2022

Description:
Burning grounds sampling

Location:
LHAAP-BG3-SO-03

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 83

Date: 11-14-2022

Description:
LHAAP-VWR-SO-03

Location:
Vehicle Wash Rack

Direction:
NA

Photo: 84

Date: 11-14-2022

Description:
LHAAP-VWR-SO-03
Soil Sample

Location:
Vehicle Wash Rack

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 85

Date: 11-15-2022

Description:
LHAAP-PA2-SO-05 Soil Sample

Location:
Plant Area 2

Direction:
NA

Photo: 86

Date: 11-10-2022

Description:
Well conditions MW-1

Location:
Burning Ground 3

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 87

Date: 11-10-2022

Description:
Well condition and location of well 35AWW20.

Location:
Vehicle Wash Rack - well 35AWW20

Direction:
Southwest

Photo: 88

Date: 11-10-2022

Description:
Well condition and location of well LHSMW21.

Location:
Plant Area 2 - well LHSM21

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 89

Date: 11-10-2022

Description:
Well condition and location of well LHSMW21.

Location:
Plant Area 2 - well LHSM21

Direction:
South

Photo: 90

Date: 11-08-2022

Description:
LHAAP soil boring (DPT)

Location:
LHAAP-ONFS-GW02

Direction:
Northeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 91

Date: 11-07-2022

Description:
LHAAP-ONFS-GW-01

Location:
Old New Fire Station

Direction:
East

Photo: 92

Date: 11-08-2022

Description:
LHAAP–VWR-SO-02
Soil Sampling Mark

Location:
Vehicle Wash Rack

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 93

Date: 11-08-2022

Description:
Photo taken facing towards Former Brine Tank area.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW08

Direction:
Northeast

Photo: 94

Date: 11-08-2022

Description:
New Fire Station from well viewpoint.

Location:
Old and New Fire Stations -Well LHSMW01

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 95

Date: 11-08-2022

Description:
Road leading west of Plant Area 3. Drainage ditch located left side of photo.

Location:
Plant Area 3 - Well 35BWW23

Direction:
West

Photo: 96

Date: 11-08-2022

Description:
Photo taken facing the nearest road.

Location:
Plant Area 3 - Well 47WW49

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 97

Date: 11-08-2022

Description:
East of the well looks into the former Plant Area.

Location:
Plant Area 3 - Well 47WW48

Direction:
East

Photo: 98

Date: 11-08-2022

Description:
Photo facing towards New Fire Station and road intersection.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW02

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 99

Date: 11-08-2022

Description:
Photo facing towards the road. Drainage ditch is surrounding the well area.

Location:
Former Pilot Wastewater Treatment Plant -Well 04WW07

Direction:
West

Photo: 100

Date: 11-08-2022

Description:
Well area is surrounded by woods. Road is located northwest of the well.

Location:
Plant Area 3 - 35BWW07

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 101

Date: 11-08-2022

Description:
Road access south of the well.

Location:
Plant Area 2 - LHSMW19

Direction:
South

Photo: 102

Date: 11-08-2022

Description:
Former training course remnants located west of well.

Location:
Plant Area 3 - Well LHSMW50

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 103

Date: 11-08-2022

Description:
Road access south of the well.

Location:
Plant Area 2 - 46WW11

Direction:
South

Photo: 104

Date: 11-08-2022

Description:
Remnants of Plant Area 2 remain east of the well.

Location:
Plant Area 2 -Well 46WW06

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 105

Date: 11-08-2022

Description:
Road access can be found east of the well. Pink arrows have been marked for direction.

Location:
Plant Area 2 - 46WW09

Direction:
East

Photo: 106

Date: 11-12-2022

Description:
LHAAP-HWSA-SO-02

Location:
LHAAP-HWSA-SO-02

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 107

Date: 11-11-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-04

Direction:
NA

Photo: 108

Date: 11-11-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-04

Direction:
Southwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 109

Date: 11-12-2022

Description:
LHAAP-HWSA-SO-02
Soil Sample

Location:
Hazardous Waste
Storage Area

Direction:
NA

Photo: 110

Date: 11-15-2022

Description:
LHAAP-PA2-SO-03

Location:
Moved into ditching area
flag placed

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 111

Date: 11-15-2022

Description:
LHAAP-PA2-SO-03

Location:
Moved into ditching area
flag placed

Direction:
South

Photo: 112

Date: 11-09-2022

Description:
LHAAP-PA3-SO-02

Location:
LHAAP

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 113

Date: 11-15-2022

Description:
LHAAP-PA2-SO-03

Location:
Moved into ditching area
flag placed

Direction:
NA

Photo: 114

Date: 11-15-2022

Description:
LHAAP-PA2-SO-03

Location:
Moved into ditching area
flag placed

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

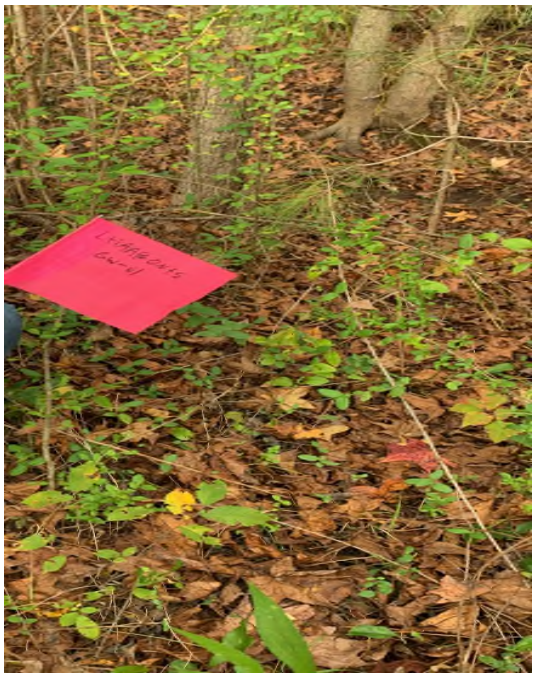


Photo: 115

Date: 11-07-2022

Description:
LHAAP-ONFS-GW-01

Location:
Behind Connex box

Direction:
NA

Photo: 116

Date: 11-14-2022

Description:
LHAAP-CAS-SO-01

Location:
Container Area Storage

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 117

Date: 11-14-2022

Description:
LHAAP-CAS-SO-01

Location:
Container Area Storage

Direction:
NA

Photo: 118

Date: 11-10-2022

Description:
LHAAP-BG3-SO-02

Location:
Burning grounds

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 119

Date: 11-10-2022

Description:
Well conditions 18CPT-MW-04

Location:
Burning Ground 3

Direction:
East

Photo: 120

Date: 11-10-2022

Description:
Well condition and location of LHSMW22

Location:
Plant Area 2 - well LHSMW22

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 121

Date: 11-08-2022

Description:
LHAAP soil boring (DPT)

Location:
LHAAP-ONFS-GW03

Direction:
West

Photo: 122

Date: 11-10-2022

Description:
Well condition and location of well 35AWW06

Location:
Vehicle Wash Rack - well 35AWW06

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 123

Date: 11-10-2022

Description:
Well condition and location of well 47WW19.

Location:
Plant Area 3 - well 47WW19

Direction:
West

Photo: 124

Date: 11-07-2022

Description:
LHAAP-ONFS-GW-01

Location:

Old New Fire Station

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 125

Date: 11-09-2022

Description:
LHAAP-PA3-SO-03

Location:

Plant Area 3

Direction:
NA

Photo: 126

Date: 11-07-2022

Description:
LHAAP-CSA-GW-01

Location:
Container Storage Area

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 127

Date: 11-08-2022

Description:
LHAAP–VWR-SO-01

Location:
Vehicle Wash Rack

Direction:
West

Photo: 128

Date: 11-08-2022

Description:
LHAAP–VWR-SO-01

Location:
Vehicle Wash Rack

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 129

Date: 11-08-2022

Description:
Photo facing towards the road and storage area.

Location:
Former Pilot Wastewater Treatment Plant - Well 04WW08

Direction:
North

Photo: 130

Date: 11-08-2022

Description:
West of the well, looking into the woods.

Location:
Plant Area 3 - Well 47WW48

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 131

Date: 11-08-2022

Description:
Photo facing towards Former Dike

Location:
Former Pilot Wastewater Treatment Plant -Well 04WW07

Direction:
East

Photo: 132

Date: 11-10-2022

Description:
Burning grounds

Location:
LHAAP-BG3-SO-01

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 133

Date: 11-11-2022

Description:
Plant area 2 ditch

Location:
LHAAP-PA2-SO-05

Direction:
NA

Photo: 134

Date: 11-11-2022

Description:
Plant area 2 ditch

Location:
LHAAP-PA2-SO-05

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 135

Date: 11-14-2022

Description:
LHAAAP-CAS-SO-02

Location:
Container Storage Area

Direction:
NA

Photo: 136

Date: 11-14-2022

Description:
LHAAAP-CAS-SO-02

Location: Container Storage Area

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 137

Date: 11-15-2022

Description:

LHAAP-PA2-SO-01

Location:

Plant Area 2

Direction:
NA

Photo: 138

Date: 11-15-2022

Description:

LHAAP-PA2-SO-01

Location:

Plant Area 2

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 139

Date: 11-15-2022

Description:

LHAAP-PA2-SO-01 Soil Sample Site

Location:
Plant Area 2

Direction:
NA

Photo: 140

Date: 11-10-2022

Description:
Well conditions 120

Location:
120

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 141

Date: 11-10-2022

Description:
Well location and description of well LHSMW23R

Location:
Plant Area 2 - well LHSMW23R

Direction:
Northeast

Photo: 142

Date: 11-08-2022

Description:
LHAAP soil boring (DPT)

Location:
LHAAP-ONFS-GW04

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 143

Date: 11-10-2022

Description:
Well location and condition of well LHSM54.

Location:
Plant Area 3 - well LHSMW54

Direction:
Southeast

Photo: 144

Date: 11-07-2022

Description:
LHAAP-HWSA-GW-01

Location:
LHAAP Hazardous Waste Storage Area

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 145

Date: 11-08-2022

Description:
LHAAP-PA3-SO-09 sample

Location:
LHAAP

Direction:
North

Photo: 146

Date: 11-08-2022

Description:
LHAAP-PA3-SO-09 sample

Location:
LHAAP

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 147

Date: 11-11-2022

Description:
South of sump of building

Location:
LHAAP-PA-SO-06

Direction:
NA

Photo: 148

Date: 11-11-2022

Description:
South of sump of building

Location:
LHAAP-PA-SO-06

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 149

Date: 11-10-2022

Description:
Burning grounds

Location:
LHAAP-BG3-SO-04

Direction:
NA

Photo: 150

Date: 11-10-2022

Description:
Burning grounds

Location:
LHAAP-BG3-SO-04

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 151

Date: 11-10-2022

Description:
Burning grounds

Location:
LHAAP-BG3-SO-04

Direction:
Southeast

Photo: 152

Date: 11-07-2022

Description:
LHAAP-LHAMW01

Location:
general avenue p area

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 153

Date: 11-07-2022

Description:
LHAAP-LHAMW01

Location:
general avenue p area

Direction:
East

Photo: 154

Date: 11-14-2022

Description:
LHAAAP-CAS-SO-03

Location:
LHAAP

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 155

Date: 11-14-2022

Description:
LHAAAP-CAS-SO-03

Location:
LHAAP

Direction:
NA

Photo: 156

Date: 11-09-2022

Description:
LHAAP-PA3-SO-05 Soil Sample

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 157

Date: 11-09-2022

Description:
LHAAP-PA3-SO-05

Location:
Plant Area 3

Direction:
NA

Photo: 158

Date: 11-10-2022

Description:
Well conditions MW-2

Location:
MW-2

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 159

Date: 11-08-2022

Description:
LHAAP–PA3-SO-08

Location:
LHAAP
Plant Area 3

Direction:
NA

Photo: 160

Date: 11-08-2022

Description:
LHAAP–PA3-SO-08

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 161

Date: 11-07-2022

Description:
LHAAP-O4WW08

Location:
general avenue p area

Direction:
S

Photo: 162

Date: 11-07-2022

Description:
LHAAP-O4WW08

Location:
general avenue p area

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 163

Date: 11-09-2022

Description:
LHAAP-PA3–SO-06

Location:
LHAAP

Direction:
NA

Photo: 164

Date: 11-09-2022

Description:
LHAAP-PA3–SO-06

Location:
LHAAP

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 165

Date: 11-10-2022

Description:
LHAAP-PA2-SO-07

Location:
West of road in ditch

Direction:
NA

Photo: 166

Date: 11-10-2022

Description:
LHAAP-PA2-SO-07

Location:
West of road in ditch

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 167

Date: 11-10-2022

Description:
Well conditions MW-3

Location:
MW-3

Direction:
West

Photo: 168

Date: 11-08-2022

Description:
LHAAP-PA3-SO—10

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 169

Date: 11-07-2022

Description:
LHAAP-ONFS—GW-04

Location:
West of fire station

Direction:
West

Photo: 170

Date: 11-07-2022

Description:
LHAAP-ONFS—GW-04

Location:
West of fire station

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 171

Date: 11-09-2022

Description:
LHAAP-PA3-SO-11

Location:
LHAAP

Direction:
NA

Photo: 172

Date: 11-09-2022

Description:
LHAAP-PA3-SO-11

Location:
LHAAP Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 173

Date: 11-10-2022

Description:
West of road in ditch.
Next to building

Location:
LHAAP-PA2-SO-12
Plant Area 2

Direction:
West

Photo: 174

Date: 11-10-2022

Description:
Well conditions MW-21

Location:
MW-21

Direction:
Southwest

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 175

Date: 11-08-2022

Description:
LHAAP-PA3-SO-07

Location:
North of well 35WW023

Direction:
North

Photo: 176

Date: 11-08-2022

Description:
LHAAP-PA3-SO-07

Location:
North of well 35WW023

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 177

Date: 11-07-2022

Description:
LHAAP-ONFS-GW-03

Location:
behind fire station

Direction:
South

Photo: 178

Date: 11-09-2022

Description:
LHAAP-PA3-SO-04

Location:
LHAAP southeast of building

Direction:
Southeast

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 179

Date: 11-09-2022

Description:
LHAAP-PA3-SO-04

Location:
LHAAP southeast of building

Direction:
Southeast

Photo: 180

Date: 11-09-2022

Description:
LHAAP-PA3-SO-04

Location:
LHAAP southeast of building

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 181

Date: 11-10-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-12

Direction:
NA

Photo: 182

Date: 11-10-2022

Description:
Well conditions 18CPT-MW-23

Location:
18CPT-MW-23

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 183

Date: 11-10-2022

Description:
Well conditions 18CPT-MW-23

Location:
18CPT-MW-23

Direction:
South

Photo: 184

Date: 11-08-2022

Description:
LHAAP PA3-S0-02

Location:
South of LHSMW44

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

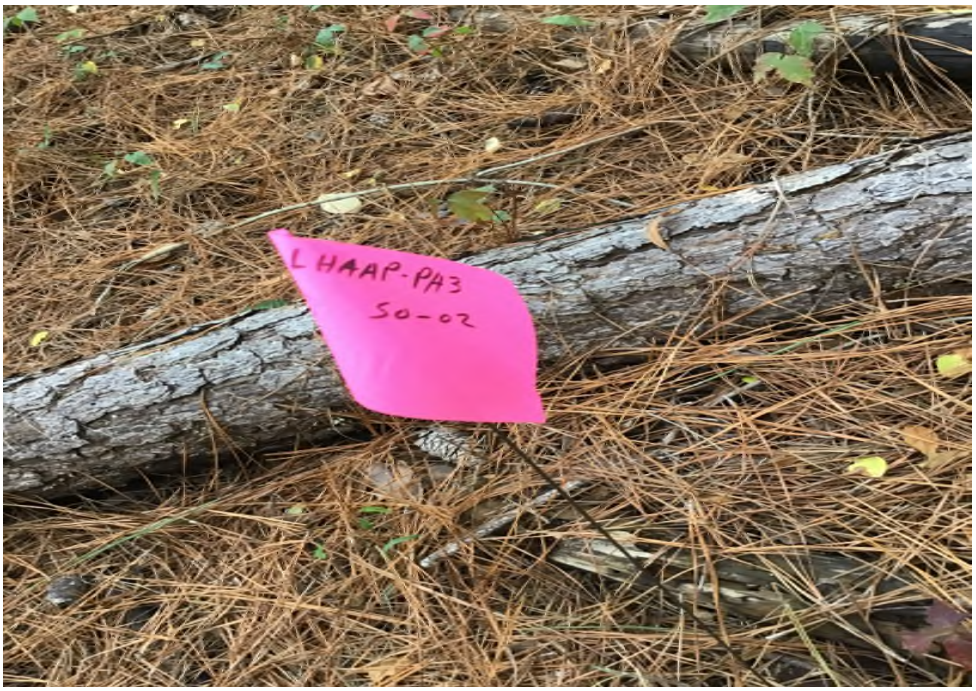


Photo: 185

Date: 11-08-2022

Description:
LHAAP PA3-S0-02

Location:
South of LHSMW44

Direction:
East

Photo: 186

Date: 11-08-2022

Description:
LHAAP PA3-S0-02

Location:
South of LHSMW44

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 187

Date: 11-09-2022

Description:
LHAAP-FWDF-SO-03

Location:
LHAAP

Direction:
NA

Photo: 188

Date: 11-09-2022

Description:
LHAAP-FWDF-SO-03

Location:
LHAAP

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 189

Date: 11-10-2022

Description:
Plant area 2 located opposite of roadside from LHAAP-PA2-SO-12 and 07 east

Location:
LHAAP-PA2-SO-13

Direction:
East

Photo: 190

Date: 11-10-2022

Description:
Plant area 2 located opposite of roadside from LHAAP-PA2-SO-12 and 07 east

Location:
LHAAP-PA2-SO-13

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 191

Date: 11-07-2022

Description:
LHAAP-VWR-SO-02
Sample site mark

Location:
Across street from
LHAAP 35AWW20 at
Vehicle Wash Rack

Direction:
NA

Photo: 192

Date: 11-07-2022

Description:
LHAAP-VWR-SO-02
Soil Sample Mark

Location:
Across street from
LHAAP 35AWW20
Vehicle Wash Rack

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 193

Date: 11-08-2022

Description:
LHAAP-PA3-S0-01
Sample Mark

Location:
Plant Area 3

Direction:
North

Photo: 194

Date: 11-08-2022

Description:
LHAAP-PA3-S0-01

Location:
Plant Area 3

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 195

Date: 11-10-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-01

Direction:
NA

Photo: 196

Date: 11-10-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-01

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 197

Date: 11-09-2022

Description:
LHAAP-BG3-SO-05 sample marking north of debris

Location:
LHAAP

Direction:
North

Photo: 198

Date: 11-09-2022

Description:
LHAAP-BG3-SO-05 sample marking north of debris

Location:
LHAAP

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 199

Date: 11-09-2022

Description:
LHAAP-BG3-SO-05 sample marking north of debris

Location:
LHAAP

Direction:
North

Photo: 200

Date: 11-09-2022

Description:
LHAAP-BG3-SO-05 sample marking north of debris

Location:
LHAAP

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 201

Date: 11-09-2022

Description:
LHAAP-BG3-SO-05 sample marking north of debris

Location:
LHAAP

Direction:
North

Photo: 202

Date: 11-07-2022

Description:
LHAAP-VWR-SO-03

Location:
Further behind SO-04 in brush

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 203

Date: 11-07-2022

Description:
LHAAP-VWR-SO-03

Location:
Further behind SO-04 in brush

Direction:
NA

Photo: 204

Date: 11-07-2022

Description:
LHAAP-VWR-SO-03
Soil sample mark

Location:
Further behind SO-04 in brush

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

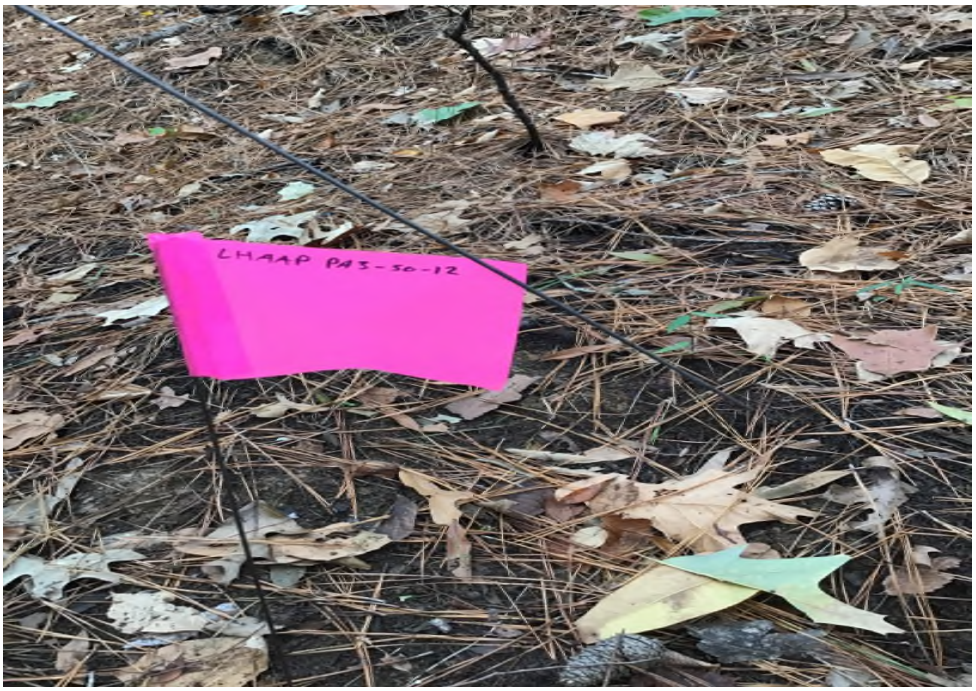


Photo: 205

Date: 11-08-2022

Description:
LHAAP-PA3-S0-12

Location:
Ditch south of Karnack Street

Direction:
North

Photo: 206

Date: 11-08-2022

Description:
LHAAP-PA3-S0-12

Location:
Ditch south of Karnack Street

Direction:
North

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 207

Date: 11-07-2022

Description:
LHAAP-VWR-SO-01

Location:
Along road line of Avenue P across from concrete pad

Direction:
NA

Photo: 208

Date: 11-07-2022

Description:
LHAAP-VWR-SO-01

Location:
Along road line of Avenue P across from concrete pad

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 209

Date: 11-07-2022

Description:
LHAAP-VWR-SO-01

Location:
Along road line of Avenue P across from concrete pad

Direction:
NA

Photo: 210

Date: 11-10-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-02

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 211

Date: 11-10-2022

Description:
Plant Area 2

Location:
LHAAP-PA2-SO-02

Direction:
NA

Photo: 212

Date: 11-09-2022

Description:
LHAAP-BG3-SO-03
Soil Sample mark

Location:
Buring Ground #3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 213

Date: 11-09-2022

Description:
LHAAP-BG3-SO-03
Soil Sample Mark

Location:
Burning Ground #3

Direction:
NA

Photo: 214

Date: 11-09-2022

Description:
LHAAP-BG3-SO-03
Soil Sample mark

Location:
Burning Ground #3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 215

Date: 11-08-2022

Description:
LHAAP-PA3-S0-03

Location:
Between 59th and 58th street in ditch

Direction:
East

Photo: 216

Date: 11-08-2022

Description:
LHAAP-PA3-S0-03

Location:
Between 59th and 58th street in ditch

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 217

Date: 11-09-2022

Description:
LHAAP-BG3-S0-02

Location:
LHAAP

Direction:
West

Photo: 218

Date: 11-09-2022

Description:
LHAAP-BG3-S0-02

Location:
LHAAP

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 219

Date: 11-09-2022

Description:
LHAAP-BG3-S0-02

Location:
LHAAP

Direction:
West

Photo: 220

Date: 11-09-2022

Description:
LHAAP-BG3-S0-02

Location:
LHAAP

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 221

Date: 11-07-2022

Description:
LHAAP-PA3-SO-09
Soil sample mark

Location:
Plant Area 3

Direction:
NA

Photo: 222

Date: 11-07-2022

Description:
LHAAP-PA3-SO-09
Soil sample mark

Location:
Plant Area 3

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 223

Date: 11-07-2022

Description:
LHAAP-PA3-SO-09

Location:
Plant Area 3

Direction:
NA

Photo: 224

Date: 11-08-2022

Description:
LHAAP- PA3-S0-11

Location:
South of Karnack st

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 225

Date: 11-08-2022

Description:
LHAAP- PA3-S0-11

Location:
South of Karnack st

Direction:
East

Photo: 226

Date: 11-09-2022

Description:
LHAAP- BG3-SO-01

Location:
North of well LHAAP-18CPTMW04

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 227

Date: 11-09-2022

Description:
LHAAP- BG3-SO-01

Location:
North of well LHAAP-18CPTMW04

Direction:
South

Photo: 228

Date: 11-07-2022

Description:
LHAAP-PA3-SO-08

Location:
South of 49th street

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 229

Date: 11-07-2022

Description:
LHAAP-PA3-SO-08

Location:
South of 49th street

Direction:
NA

Photo: 230

Date: 11-07-2022

Description:
LHAAP-PA3-SO-08

Location:
South of 49th street

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 231

Date: 11-08-2022

Description:
LHAAP-PA3-S0-05

Location:
South west corner 56th street

Direction:
West

Photo: 232

Date: 11-08-2022

Description:
LHAAP-PA3-S0-05

Location:
South west corner 56th street

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 233

Date: 11-08-2022

Description:
LHAAP-PA3-S0-05

Location:
South west corner 56th street

Direction:
West

Photo: 234

Date: 11-08-2022

Description:
LHAAP-PA3-S0-05

Location:
South west corner 56th street

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 235

Date: 11-09-2022

Description:
LHAAP-BG3-SO-04

Location:
East of burm

Direction:
East

Photo: 236

Date: 11-09-2022

Description:
LHAAP-BG3-SO-04

Location:
East of burm

Direction:
East

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 237

Date: 11-07-2022

Description:
LHAAP-PA3-SO-10

Location:
Between maze of concrete buildings south of 59th street

Direction:
NA

Photo: 238

Date: 11-07-2022

Description:
LHAAP-PA3-SO-10

Location:
Between maze of concrete buildings south of 59th street

Direction:
NA

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 239

Date: 11-07-2022

Description:
LHAAP-PA3-SO-10

Location:
Between maze of concrete buildings south of 59th street

Direction:
NA

Photo: 240

Date: 11-08-2022

Description:
LHAAP-PA3-S0-06

Location:
Southwest of Galveston and 58th intersection

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 241

Date: 11-08-2022

Description:
LHAAP-PA3-S0-06

Location:
Southwest of Galveston and 58th intersection

Direction:
West

Photo: 242

Date: 11-08-2022

Description:
LHAAP-PA3-S0-06

Location:
Southwest of Galveston and 58th intersection

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 243

Date: 11-08-2022

Description:
LHAAP-PA3-S0-06

Location:
Southwest of Galveston and 58th intersection

Direction:
West

Photo: 244

Date: 11-08-2022

Description:
LHAAP-FWDF-S0-01

Location:
West side of bridge

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 245

Date: 11-08-2022

Description:
LHAAP-FWDF-S0-01

Location:
West side of bridge

Direction:
South

Photo: 246

Date: 11-08-2022

Description:
LHAAP-FWDW-S0-02

Location:
East side of bridge

Direction:
West

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 247

Date: 11-08-2022

Description:
LHAAP-FWDW-S0-02

Location:
East side of bridge

Direction:
West

Photo: 248

Date: 11-08-2022

Description:
LHAAP-FDWF-S0-03

Location:
East of bridge, second terrace

Direction:
South

Appendix J - SI Photo Log

USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Photo: 249

Date: 11-08-2022

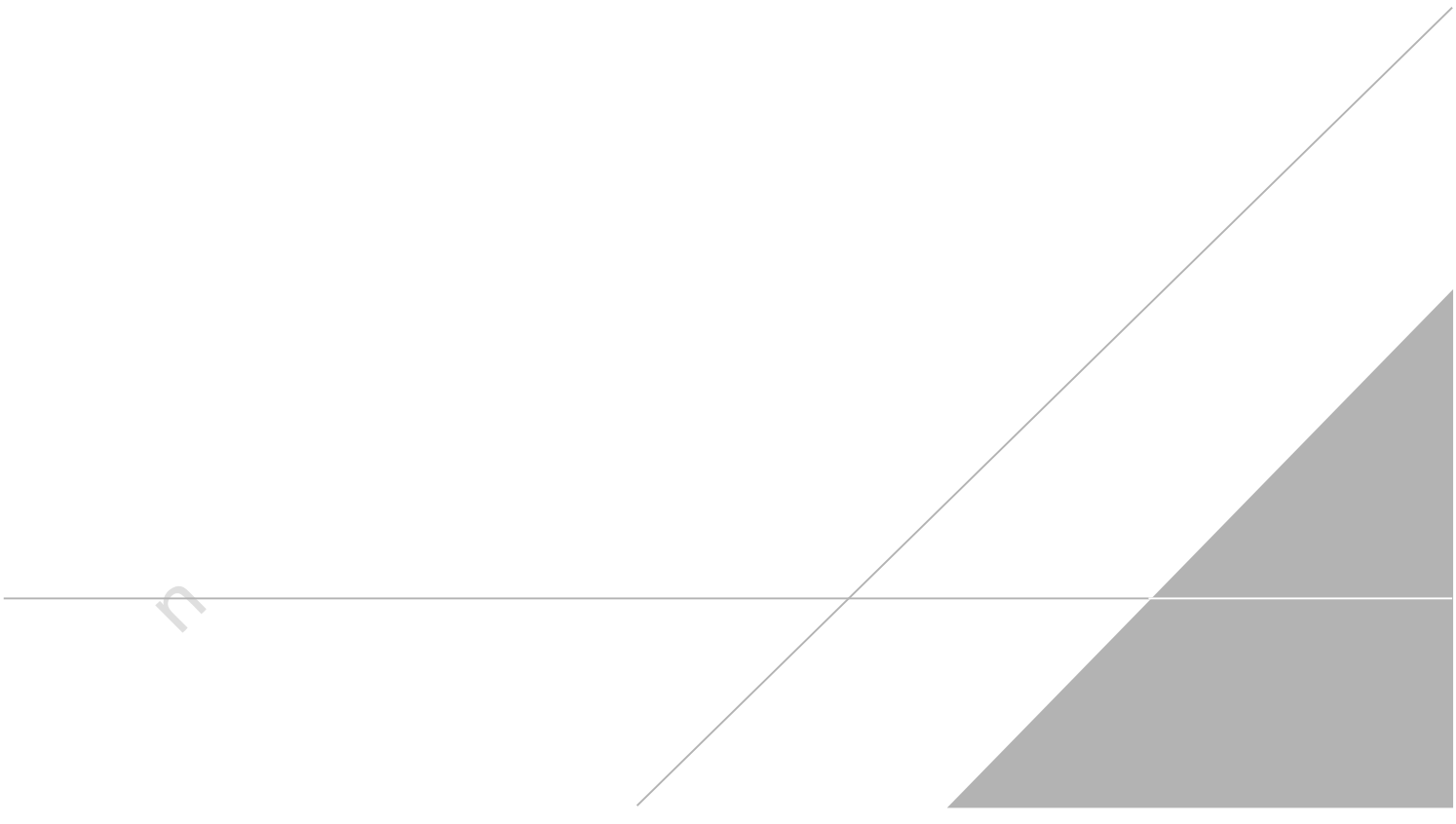
Description:
LHAAP-FDWF-S0-03

Location:
East of bridge, second terrace

Direction:
South

APPENDIX K

Field Change Reports



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Appendix K
Field Change Report
U.S. Army Environmental Command
Per- and Polyfluoroalkyl Substances Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Field Change Report No. FCR-LHAAP-01

Installation Name: Former Longhorn Army Ammunition Plant (LHAAP), Texas

Event Date: 09 November 2022

Project/Task No: 30001997.40013 Contract Number: W912DR-18-D-0004

Applicable Document: QAPP Addendum: Worksheet #18 and associated figure(s)

Prepared By: Laura Gloria

DESCRIPTION
One existing monitoring well LHAAP-47WW49 at Plant Area 2 had a small water column. The well was designated to be purged using a bladder pump but was purged dry using a bailer and samples were collected after sufficient recharge. Water quality parameters were not collected due to the insufficient amount of water.
REASON FOR CHANGE
The well had a small water column, and was purged using a bailer instead of a bladder pump. Due to the insufficient water supply, groundwater parameters were not collected.
IMPACT ON PRESENT AND COMPLETED WORK (Note: If impact is major or critical and/or corrective action is necessary, use Non-Conformance Report, additional documentation is required)
No anticipated impact on the overall scope of project work.
REMARKS
The water column for LHAAP-47WW49 was less than 1 inch.

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Appendix K
Field Change Report
U.S. Army Environmental Command
Per- and Polyfluoroalkyl Substances Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Field Change Report No. FCR-LHAAP-02

Installation Name: Former Longhorn Army Ammunition Plant (LHAAP), Texas

Event Date: 09 November 2022

Project/Task No: 30001997.40013 Contract Number: W912DR-18-D-0004

Applicable Document: QAPP Addendum: Worksheet #18 and associate figure(s)

Prepared By: Laura Gloria

DESCRIPTION

Eight existing monitoring wells were dry upon gauging. Five were replaced with alternate wells as described below:

Plant Area 2: LHAAP-LHSMW22 was dry and was replaced with well LHAAP-46WW02. LHAAP-46WW13, LHAAP-LHSMW18, and LHAAP-LHSMW24 were dry, however the next most suitable monitoring well locations were already sampled, so additional replacement groundwater sampling was not necessary.

Plant Area 3: LHAAP-47WW05, LHAAP-LHSMW42, LHAAP-LHSMW43, and LHAAP-LHSMW56 were dry and were replaced with wells LHAAP-47WW04, LHAAP-47WW28, LHAAP-LHSMW45, and LHAAP-LHSMW56R, respectively.

REASON FOR CHANGE

The wells were discovered to be dry during the gauging process.

IMPACT ON PRESENT AND COMPLETED WORK

No anticipated impact on the overall scope of project work.

REMARKS

Area of Potential Interest	Original Well	Replacement Well
Plant Area 2	LHSMW22	46WW02
	46WW13	No Replacement
	LHSMW18	No Replacement
	LHSMW24	No Replacement
Plant Area 3	47WW05	47WW04
	LHSMW42	47WW28
	LHSMW43	LHSMW45
	LHSMW56	LHSMW56R

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Appendix K
Field Change Report
U.S. Army Environmental Command
Per- and Polyfluoroalkyl Substances Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Field Change Report No. FCR-LHAAP-03

Installation Name: Former Longhorn Army Ammunition Plant (LHAAP), Texas

Event Date: 15 November 2022

Project/Task No: 30001997.40013 Contract Number: W912DR-18-D-0004

Applicable Document: QAPP Addendum: Worksheet #18 and associated figure(s)

Prepared By: Laura Gloria

DESCRIPTION
Equipment blanks (EBs) were taken from alternative tools than planned in the Quality Assurance Project Plan Addendum. EB-5 was taken from the acetate liner where soil samples were being placed instead of the hand shovel. EB-6 was taken from the drill instead of the check valve.
REASON FOR CHANGE
A hand shovel was not used to analyze soil samples. Soil was placed on a piece of acetate liner. EB-5 was taken from the acetate. The drill did not have a check valve, so a suitable alternative was to take EB-6 from the drill.
IMPACT ON PRESENT AND COMPLETED WORK (Note: If impact is major or critical and/or corrective action is necessary, use Non-Conformance Report, additional documentation is required)
No anticipated impact on the overall scope of project work.
REMARKS

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Appendix K
Field Change Report
U.S. Army Environmental Command
Per- and Polyfluoroalkyl Substances Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Field Change Report No. FCR-LHAAP-04

Installation Name: Former Longhorn Army Ammunition Plant (LHAAP), Texas

Event Date: 16 November 2022

Project/Task No: 30001997.40013 Contract Number: W912DR-18-D-0004

Applicable Document: QAPP Addendum: Worksheet #18 and associated figure(s)

Prepared By: Laura Gloria

DESCRIPTION

The drilling crew did not bring the appropriate tooling. Borings LHAAP-ONFS-GW-01, LHAAP-ONFS-GW-02, LHAAP-ONFS-GW-03, and LHAAP-ONFS-GW-04 were advanced on 16 November 2022 until 29 feet, 30 feet, 25 feet, and 39 feet, respectively, using hollow stem and hydropunch tooling until refusal was hit. Temporary wells were set overnight. Groundwater did recharge at LHAAP-ONFS-GW-02 and LHAAP-ONFS-GW-03 temporary wells. LHAAP-ONFS-GW-01 did not recharge and was subsequently plugged and abandoned. Tooling was stuck in the boring for LHAAP-ONFS-GW-04. The drilling company returned on 28 November 2022 with tooling to advance deeper into the borings. The boring for LHAAP-ONFS-GW-01 was moved 15 feet to the south of the original boring and advanced 6 feet. The boring for LHAAP-ONFS-GW-04 was moved 10 feet to the south of the original boring and advanced 45 feet. Sampling was completed as scoped.

REASON FOR CHANGE

Drillers did not bring the appropriate tools to advance through the lithology of the area. Drillers had to mobilize a second week with the appropriate tooling.

IMPACT ON PRESENT AND COMPLETED WORK

No anticipated impact on the overall scope of project work. The new locations were suspected to be downgradient from the potential aqueous film-forming foam release area, adjacent to the fire station apron.

REMARKS

Boring ID	Advance to	Sample Collected	Comments
LHAAP-ONFS-GW-01	6	11/28/2022	Moved 15 feet south of original boring
LHAAP-ONFS-GW-02	30	11/16/2022	
LHAAP-ONFS-GW-03	25	11/16/2022	
LHAAP-ONFS-GW-04	45	11/28/2022	Moved 10 feet south of original boring

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Appendix K
Field Change Report
U.S. Army Environmental Command
Per- and Polyfluoroalkyl Substances (PFAS) Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Field Change Report No. FCR-LHAAP-05

Installation Name: Former Longhorn Army Ammunition Plant (LHAAP), Texas

Event Date: 21 November 2022

Project/Task No: 30001997.40013 Contract Number: W912DR-18-D-0004

Applicable Document: QAPP Addendum: Worksheet #18 and associated figure(s)

Prepared By: Laura Gloria

DESCRIPTION
Samples shipped out on 21 November 2022 by FedEx were lost in transit. Ice chest included 18 samples taken on 17 November 2022 as shown in the table below. Remobilization was coordinated and occurred on 05 to 06 January 2023.
REASON FOR CHANGE
Ice chest containing samples were lost in transit. Even if the ice chest was located, due to holding time and temperature requirements, the samples would no longer be eligible to be accepted by the lab.
IMPACT ON PRESENT AND COMPLETED WORK
Another mobilization was coordinated to recollect the lost samples.

Field Change Report No. FCR-LHAAP-05

Installation Name: Former Longhorn Army Ammunition Plant (LHAAP), Texas

Event Date: 21 November 2022

Project/Task No: 30001997.40013 Contract Number: W912DR-18-D-0004

Applicable Document: QAPP Addendum: Worksheet #18 and associated figure(s)

Prepared By: Laura Gloria

REMARKS

Since analytical data was received from the samples that successfully made it to the lab prior to remobilization, it was agreed upon with the Former LHAAP point of contact that resampling areas of potential interest (AOPIs) where per- and polyfluoroalkyl substances (PFAS) has already been detected above the Office of the Secretary of Defense (OSD) risk screening levels was not necessary. This is because the purpose of the SI is to confirm presence/absence and that has been done this at those locations. The 18 samples lost in transit had been collected from various locations throughout Plant Area 2 (LHAAP-046), Plant Area 3 (LHAAP-047), the Pilot Wastewater Treatment Plant (LHAAP-004), Landfill 16 (LHAAP-016), Former Waste Disposal Facility (LHAAP-050), and Burning Ground 3/Unlined Evaporation Pond (LHAAP-018/024). These were parent groundwater quality control (QC) samples. It was determined that a remobilization would occur to recollect all QC samples as well as any parent samples from AOPIs where PFAS had not already been detected above the OSD risk screening level in preliminary laboratory reports. Upon remobilization, the only parent sample which fell into this category was 04WW08, which was located at the Pilot Wastewater Treatment Plant (LHAAP-004). LHAAP-04WW08 was collected, along with the required QC samples.

Samples that were collected during the remobilization include:

- LHAAP-04WW08-01052023
- LHAAP-FB-6-010523
- LHAAP-EB-7-010523
- LHAAP-PWTP-DEB-6-010523
- LHAAP-PA3-DEB-5-010523
- LHAAP-PA2-DEB-7-010523
- LHAAP-FWDF-DEB-3-010623
- LHAAP-BG3-DEB-4-010623

See attachments of missing samples table and chain of custody (COC) below.

Sample ID of Lost Samples	Date	Time
LHAAP-PA2-SO-01-111722	11/17/2022	15:15
LHAAP-16WW38-111722	11/17/2022	14:10
LHAAP-LHSMW50-111722	11/17/2022	13:45
LHAAP-50WW08-111722	11/17/2022	10:15
LHAAP-35BWW23-111722	11/17/2022	14:40
LHAAP-46WW11-111722	11/17/2022	16:10
LHAAP-04WW08-111722	11/17/2022	15:25
LHAAP-MW21-111722	11/17/2022	10:25

Sample ID of Lost Samples	Date	Time
LHAAP-MW23-111722	11/17/2022	12:20
LHAAP-46WW09-111722	11/17/2022	15:00
LHAAP-47WW28-111722	11/17/2022	13:30
LHAAP-47WW04-111722	11/17/2022	12:30
LHAAP-EB-2-111722	11/17/2022	15:40
LHAAP-050-DEB-3-111722	11/17/2022	9:50
LHAAP-018-DEB-4-111722	11/17/2022	12:40
LHAAP-047-DEB-5-111722	11/17/2022	14:45
LHAAP-ONFS-DEB-6-111722	11/17/2022	15:50
LHAAP-046-DEB-7-111722	11/17/2022	16:15

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www.pacelabs.com

Number 139208

Client: USACE	Report to Contact	Telephone No. / E-mail: 607-316-1272 Dana.Schmidt@arcadis.com	Quote No.
Address: Zeugner Dr.	Sampler's Signature: x Laura Glorioso	Analysis (Attach list if more space is needed)	Page 1 of
City: Karnack / State: TX / Zip Code: 75661	Printed Name: Laura Glorioso		Lot # Bar Code (lab use only)
Project Name: LHAAP			
Project No.: 30001997	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	G=Grab C=Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS QSM	Remarks / Cooler I.D.
LHAAP-PA2-SO-01-111722	11-17-22	15:15	C		X		X								
LHAAP-16WW38-111722	11-17-22	14:10	G	X											
LHAAP-LHSMW50-111722	11-17-22	13:45													
LHAAP-50WW08-111722	11-17-22	10:15													
LHAAP-35BWW23-111722	11-17-22	14:40													
LHAAP-46WW11-111722	11-17-22	16:10													
LHAAP-04WW08-111722	11-17-22	15:25													
LHAAP-MW-21-111722	11-17-22	10:25													
LHAAP-MW23-111722	11-17-22	12:20													
LHAAP-46WW09-111722	11-17-22	15:00													

Turn Around Time Required (Prior lab approval required for expedited TAT.)
X Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client X Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison X Unknown

QC Requirements (Specify)

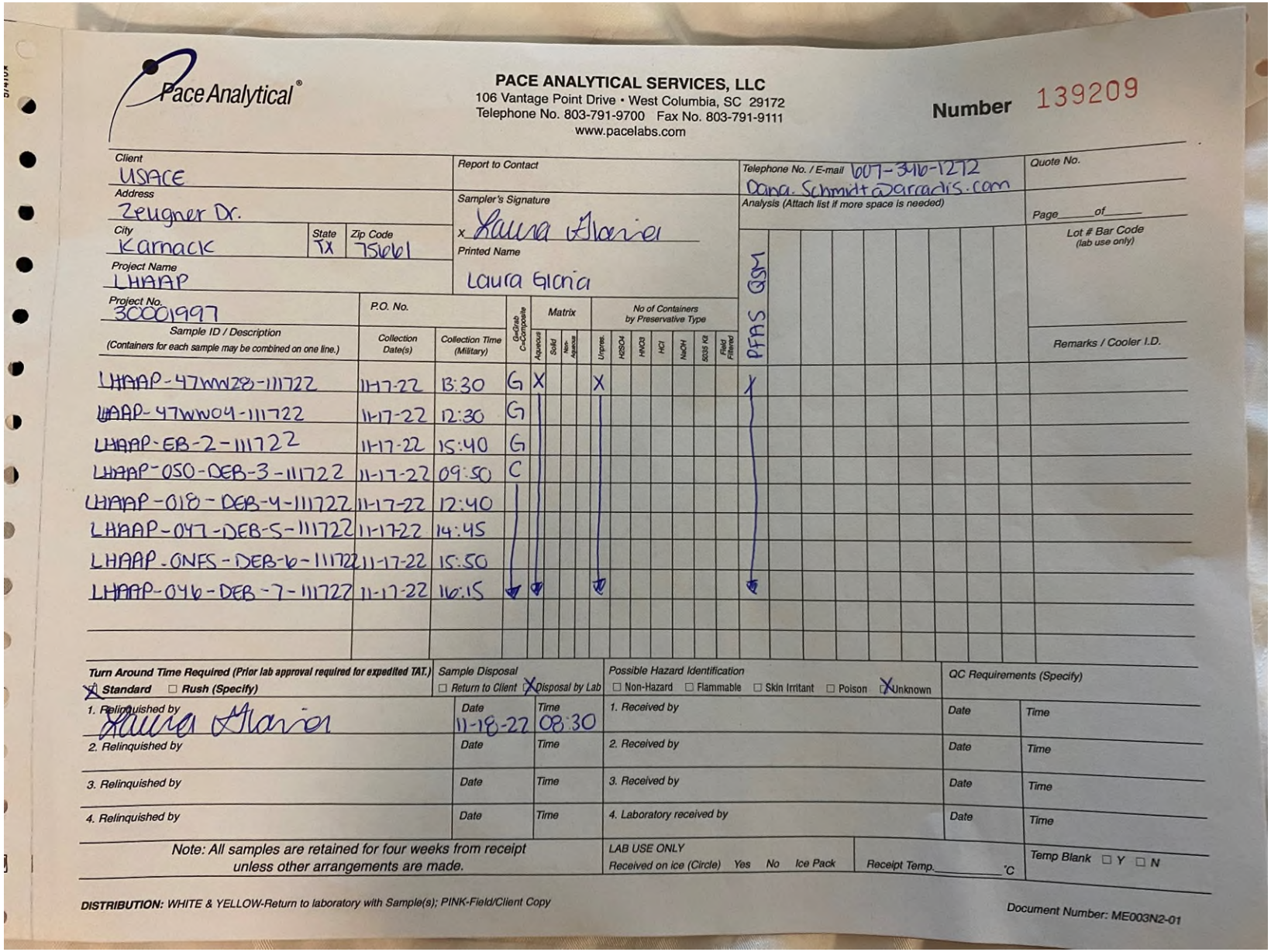
	Date	Time		Date	Time
1. Relinquished by: Laura Glorioso	11-18-22	08:30	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by		

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. _____ °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01



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www.pacelabs.com

Number 139209

Client: USACE	Report to Contact	Telephone No. / E-mail: 607-316-1272 dana.schmidt@arcadis.com	Quote No.
Address: Zeugner Dr.	Sampler's Signature: x Laura Glavier	Analysis (Attach list if more space is needed)	Page ____ of ____
City: Karnack / State: TX / Zip Code: 75661	Printed Name: Laura Glavier		Lot # Bar Code (lab use only)
Project Name: LHAAP			
Project No.: 30001997	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS GSM	Remarks / Cooler I.D.
LHAAP-47WW28-111722	11-17-22	13:30	G	X			X							X	
LHAAP-47WW04-111722	11-17-22	12:30	G												
LHAAP-EB-2-111722	11-17-22	15:40	G												
LHAAP-050-DEB-3-111722	11-17-22	09:50	C												
LHAAP-018-DEB-4-111722	11-17-22	12:40													
LHAAP-047-DEB-5-111722	11-17-22	14:45													
LHAAP-ONFS-DEB-6-111722	11-17-22	15:50													
LHAAP-046-DEB-7-111722	11-17-22	16:15													

Turn Around Time Required (Prior lab approval required for expedited TAT.)
☒ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Laura Glavier	11-18-22	08:30	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by			4. Laboratory received by		

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) Yes No Ice Pack
Receipt Temp. ____ °C
Temp Blank ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

APPENDIX L

Data Usability Summary Report (Level IV analytical reports included in final electronic deliverable only)

ARCADIS

USACE Baltimore PFAS PA/SI
Former Longhorn Army Ammunition Plant Karnack, TX

Data Usability Summary Report

November 2022, December 2022 and January 2023 Sampling Events

March 2, 2023

Data Usability Summary Report

November 2022, December 2022 and January 2023 Sampling Events

March 2, 2023

Prepared By:
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Prepared For:
U.S. Army Environmental Command
U.S. Army Corps of Engineers Baltimore District
Former Longhorn Army Ammunition Plant
Karnack, TX

Our Ref:
30001997

Lyndi Mott
Program Chemist

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Contents

Acronyms and Abbreviations iii

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Tables

Table 1 Data Usability Summary Table

Attachments

Attachment A Arcadis Data Validation Reports

Acronyms and Abbreviations

%D	percent difference
%R	percent recovery
Arcadis	Arcadis U.S., Inc.
DoD	Department of Defense
DUA	data usability assessment
DUSR	data usability summary report
DVR	data validation report
EIS	extracted internal standards
ELAP	Environmental Laboratory Accreditation Program
ICV/CCV	initial calibration verification/continuing calibration verification
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LOQ	limit of quantitation
MS/MSD	matrix spike/matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
PACE	Pace Analytical South Carolina
PACE GC	Pace Analytical Gulf Coast
PFAS	per/polyfluoroalkyl substances
PQAPP	Programmatic Uniform Federal Policy-Quality Assurance Project Plan
QAPP	Quality Assurance Project Plan
QC	quality control
QSM	Quality System Manual
RPD	relative percent difference
SDG	sample delivery group
USDOD	United States Department of Defense
USEPA	United States Environmental Protection Agency

Executive Summary

This Data Usability Summary Report (DUSR) for Former Longhorn Army Ammunition Plant in Karnack, TX for the November 2022, December 2022 and January 2023 sampling events describes the findings of the data review and validation and is provided to document the quality of the analytical data used for project decisions. A Data Usability Summary Table at the end of this DUSR lists the data that was qualified and the reason for qualification. Only the sample locations associated with this site and sampling event in the associated laboratory data packages and data validation reports are addressed in this report. The text below adds details where further discussion is warranted. The project-specific sampling and analysis, overall quality control (QC), and quality assurance protocols are presented in the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP Arcadis 2019), and the Uniform Federal Policy-Quality Assurance Project Plan Addendum for Former Longhorn Army Ammunition Plant, Texas (QAPP Addendum Arcadis 2022).

Samples were shipped to Pace Analytical (Pace) located in West Columbia, South Carolina for analysis. The total organic carbon (TOC) analyses were subcontracted to Pace Gulf Coast (Pace GC) located in Baton Rouge, Louisiana. Pace and Pace GC are United States Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and National Environmental Laboratory Accreditation Program (NELAP) accredited laboratories. The analytical sample delivery groups (SDGs) and associated Arcadis validation reports are listed in the table below. Summaries of the sample IDs and their associated laboratory IDs, SDGs, sampling dates, and analyses performed are provided in the laboratory reports and data validation reports (DVRs). Note the result pages in the DVRs may have a red line through specific or all compounds to indicate those results are not reportable. Results will be reported from either the initial, diluted, or re-extracted analysis.

In accordance with the project QAPP review requirements a 10% Stage 4 validation of the analytical data was performed by Arcadis project Chemists that was independent of the project team. A Stage 4 validation includes all of Stage 1, Stage 2A, Stage 2B and Stage 3 requirements; is a qualitative review of non-detected and detected results from instrument outputs; and includes review of chromatograms. The remaining 100% of the data went through a Stage 2b which, deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP Arcadis, 2019), however was conducted in accordance with the guidelines, control criteria specified in the following documents, and had no to little impact on the outcome of this data summary and usability report:

USDOD. Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.3 May 2019.

USDOD. DoD General Data Validation Guidelines, November 2019.

USDOD. DoD Final Data Validation Guidelines Module 3: PFAS, May 2020.

Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan (PQAPP Arcadis 2019).

The laboratory data packages and validation reports that were reviewed for this DUSR are listed below.

Sample Delivery Groups (SDG)	Validation Report	Matrix	Parameters	Validation Level
XK11065	47957R	Soil	PFAS	Stage 3: 18 field samples; 2 field duplicates Stage 4: 2 field samples

Sample Delivery Groups (SDG)	Validation Report	Matrix	Parameters	Validation Level
XK21004 22112307	48015R	Soil/Water	PFAS; TOC; pH	Stage 3: 31 field samples 2 field duplicates Stage 4: 3 field samples
XK21007 222112401	48030R	Soil/Water	PFAS; TOC; pH	Stage 3: 7 field samples Stage 4: 1 field sample
XK14005 222111623	48069R	Soil/Water	PFAS; TOC; pH	Stage 3: 23 field samples Stage 4: 2 field samples
XL03005	48118R	Soil/Water	PFAS	Stage 3: 4 field samples Stage 4: 1 field sample
XL05008	48119R	Water	PFAS	Stage 3: 2 field samples Stage 4: 1 field sample
XL03006	48354R	Soil/Water	PFAS; TOC; pH	Stage 3: 19 field samples 5 field duplicates Stage 4: 2 field samples
YA09008	48564R	Water	PFAS	Stage 3: 6 field samples Stage 4: 1 field sample

1 Precision

Precision is expressed as a relative percent difference (RPD) between the results of replicate sample analyses: sample duplicates, laboratory control sample duplicates (LCSDs), and matrix spike duplicates (MSDs). The RPD limit for LCSDs and MSDs is 30 percent. Field duplicates were collected at a frequency of 5 percent. Unless documented below or in the Data Usability Summary table, the RPD between the parent samples and associated field duplicates were within acceptable limits of 35 percent for water matrix and 50 percent for soil matrix.

Soil sample LHAAP-PA3-SO-09-110822 was identified as the parent sample to field duplicate LHAAP-FD-2-SO-110822. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 50 percent RPD.

Soil sample LHAAP-VWR-SO-02-110822 was identified as the parent sample to field duplicate LHAAP-FD-1-SO-110822. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 50 percent RPD.

Soil sample LHAAP-CSA-SO-02-111422 was identified as the parent sample to field duplicate LHAAP-FD-3-SO-111422. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 50 percent RPD.

Water sample LHAAP-35AWW06-111422 was identified as the parent sample to field duplicate LHAAP-FD-1-111422. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 35 percent RPD.

Groundwater sample LHAAP-47WW42-113022 was identified as the parent sample to field duplicate LHAAP-FD-2-GW-113022. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 35 percent RPD.

Groundwater sample LHAAP-35BWW07-112922 was identified as the parent sample to field duplicate LHAAP-FD-3-GW-112922. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 35 percent RPD.

Groundwater sample LHAAP-LHSMW54-112922 was identified as the parent sample to field duplicate LHAAP-FD-4-GW-112922. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 35 percent RPD.

Groundwater sample LHAAP-CSA-GW-01-112922 was identified as the parent sample to field duplicate LHAAP-FD-5-GW-112922. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 35 percent RPD.

Groundwater sample LHAAP-HWSA-GW-01-112922 was identified as the parent sample to field duplicate LHAAP-FD-6-GW-112922. The evaluation of the parent sample and field duplicate indicate precision was within the criteria of 35 percent RPD.

2 Accuracy

Accuracy is demonstrated by recovery of target analytes from fortified blank and sample matrices, LCS/LCSDs and MS/MSDs, respectively. The recovery of target analytes from fortified samples is compared to acceptance criteria. The criteria are listed in DoD QSM 5.3 Appendix C, Table C-44 and C-45. The criteria for EIS recoveries

are 50 to 150 percent. In addition, Stage 4 validation of initial and continuing calibration results provide information on analytical accuracy. Unless documented below or in the Data Usability Summary table, the recoveries of LCS, MS/MSD, and extracted internal standards (EIS), and calibration criteria, were within acceptable limits.

As noted in the Data Usability Summary Table, EIS recoveries were outside control limits for many samples. Since EIS are associated with specified compounds, only a few compounds per sample may be qualified. Where EIS recoveries were less than 20 percent, and qualified as "X", a discussion of the potential impact on the reported results is in Conclusions.

The case narratives noted where the sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Typically, this was due to a layer of sediment in the sample container. Elution solvent was aliquoted directly into the SPE filtering reservoir, rinsing the inside. Eliminating the bottle rinse is a modification of the method and may bias PFAS results low. Therefore, all PFAS compounds are qualified as estimated (UJ,J-) for the affected sample locations as noted in the Data Usability Summary Table.

3 Representativeness

Representativeness is the degree to which sample data accurately and precisely represent site conditions and is dependent on sampling and analytical variability and the variability (or homogeneity) of the site itself. The use of the prescribed field and laboratory analytical methods with associated holding times and preservation requirements are intended to provide representative data.

All samples were collected and submitted for analysis in accordance with the procedures and sampling plan specified in the site QAPP and field SOPs. Analysis of samples was in accordance with the USACE PFAS PA/SI PQAPP, DoD QSM, and laboratory SOPs. All hold times were met except for soil pH, and TOC for sample LHAAP-PA3-SO-01-112822 as noted in the Data Usability Summary Table.

4 Sensitivity

Sensitivity describes the relationship between the laboratory quantitation limits and the project action limits. Reported laboratory quantitation limits are compared to the project detection limits to ensure that the analytical methods are capable of quantifying target analytes to a level that would satisfy DQOs.

The detection limits for the soil and sediment samples were elevated due to correction for percent moisture.

There were groundwater samples that contained solids and/or were turbid. The laboratory performed centrifugation following the PFAS Aqueous Centrifuge Protocol. Samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. The centrifuge bottle was rinsed with 4mL of methanol. Some samples were still too turbid after this procedure to process the entire sample through the extraction procedure, and the original sample bottle could not be rinsed. Therefore, the affected samples have elevated detection limits due to the reduced extraction volume.

5 Completeness

The completeness for this data set met the criteria of 95 percent. Six results were qualified as potentially unusable with an “X” qualifier. The “X” qualifiers were due to extracted internal standards (EIS) exhibiting recoveries less than 20%, which is indicative of matrix interferences. A discussion of the affected results is below in Conclusions.

The field completeness did not meet the criteria of 100 percent. As stated in the QAPP, when existing monitoring wells proposed for sampling were identified as dry, the field team was to select alternative monitoring wells based on field conditions and availability. Alternative monitoring wells were selected based on proximity to proposed monitoring well, location downgradient of AOPI source, and availability of water in monitoring well. Monitoring wells LHAAP-LHSMW22, LHAAP-47WW05, LHAAP-LHSMW42, LHAAP-LHSMW56, and LHAAP-LHSMW43 were dry, and were replaced with 46WW02, 47WW04, 47WW28, LHSMW56R, and LHSMW45, respectively. Monitoring wells 46WW13, LHSMW18, and LHSMW24 were also dry, but the next most suitable monitoring well locations were already sampled, so additional replacement groundwater sampling was not necessary.

The eighteen samples collected on 11/17/2022 were lost in transit. These samples had been collected from various locations throughout Plant Area 2 (LHAAP-046), Plant Area 3 (LHAAP-047), the Pilot Wastewater Treatment Plant (LHAAP-004), Landfill 16 (LHAAP-016), Former Waste Disposal Facility (LHAAP-050), and Burning Ground 3/Unlined Evaporation Pond (LHAAP-018/024). These were parent groundwater QC samples. It was determined that a remobilization would occur during the week of 1/3/2023 to recollect all QC samples as well as any parent samples from AOPIs where PFAS had not already been detected above the OSD risk screening level in preliminary laboratory reports. Upon remobilization, the only parent sample which fell into this category was 04WW08, which was located at the Pilot Wastewater Treatment Plant (LHAAP-004). LHAAP-04WW08 was collected, along with the required DEB, EB, and FB samples.

6 Conclusions

The overall assessment of the field samples, QA/QC data review by manual validation of the November 2022, December 2022 and January 2023 data sets from Former Longhorn Army Ammunition Plant in Karnack, TX met the project requirements and analytical completeness goals of the SI. The field completeness goal was not met as noted above. The data quality objectives were to determine presence or absence of PFAS, that detections are valid, and to evaluate uncertainty. This DUSR deviated from Worksheet 36 of the Final Programmatic UFP-QAPP (PQAPP Arcadis, 2019), however was conducted in accordance with applicable guidelines and control criteria. This deviation had little impact on the usability of the data to make project decisions and met the data quality objectives. All results were determined to be valid and usable except for the data qualified as “X”. The results that are qualified as estimated are usable with caution. The detections are valid, but the reported concentration may be biased. If the data is evaluated against screening criteria, qualified results at or near the screening criteria should be evaluated considering the possible bias in the reported results.

The ”X” qualified results were reviewed by the project team and USACE chemist. It was decided that these results should be rejected. The “X” qualifier was revised to “R”.

Tables

Data Usability Summary Table

DATA USABILITY SUMMARY TABLE
Longhorn Army Ammunition Plant, TX; November 2022, December 2022 and January 2023 Sampling Events

Sample Locations	Compound	Qualifier	Reason
LHAAP-CSA-SO-02-111422 LHAAP-HWSA-SO-01-111222 LHAAP-ONFS-SO-01-111522 LHAAP-BG3-SO-01-111022 LHAAP-PA2-SO-02-111022 LHAAP-PA3-SO-01-112822	Soil pH	J	Hold time exceedance
LHAAP-FWDF-SO-01-111122	N-EtFOSAA N-MeFOSAA	UJ	MS/MSD RPD
LHAAP-BG3-SO-01	TOC	J	Laboratory Duplicate RPD
LHAAP-ONFS-GW-01-112822	Perfluorododecanoic acid (PFDoA) Perfluorotetradecanoic acid (PFTeDA) Perfluorotridecanoic acid (PFTrDA)	R	Extracted Internal Standard (EIS) %R less than 20%.
	Perfluorooctane sulfonic acid (PFOS)	J+	EIS %R less than 50%.
	N-EtFOSAA N-MeFOSAA Perfluoroundecanoic acid (PFUdA)	UJ	EIS %R less than 50%.
LHAAP-120-111522	Perfluorobutanoic acid (PFBA)	UJ	EIS %R less than 50%.
LHAAP-ONFS-GW-02-111622	6:2 FTS	J-	EIS %R greater than 150%.
	N-MeFOSAA	UJ	EIS %R less than 50%.
LHAAP-12WW01-111522 LHAAP-16WW13-111622 LHAAP-012-DEB-1-111622	Perfluorobutanoic acid (PFBA)	J+	EIS %R less than 50%.
LHAAP-18CPTMW04-111622	All target PFAS compounds	UJ non-detects J- detects	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.
LHAAP-12WW24-111622	Perfluorobutanoic acid (PFBA)	J-	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low and EIS %R less than 50%.

Sample Locations	Compound	Qualifier	Reason
LHAAP-12WW24-111622 (continued)	6:2 FTS 8:2 FTS N-EtFOSAA N-MeFOSAA Perfluorobutane sulfonic acid (PFBS) Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid (PFDoA) Perfluoroheptanoic acid (PFHpA) Perfluorohexane sulfonic acid (PFHxS) Perfluorohexanoic acid (PFHxA) Perfluorononanoic acid (PFNA) Perfluorooctane sulfonic acid (PFOS) Perfluorooctanoic acid (PFOA) Perfluoropentanoic acid (PFPeA) Perfluorotetradecanoic acid (PFTeDA) Perfluorotridecanoic acid (PFTrDA) Perfluoroundecanoic acid (PFUdA)	UJ non-detects J- detects	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.
LHAAP-HWSA-GW-01-112922	Perfluorotetradecanoic acid (PFTeDA)	R	Due to sample matrix, full sample volume not used. Sample container not rinsed and EIS %R less than 20% MS/MSD RPD
	Perfluorododecanoic acid (PFDoA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low and EIS %R less than 50%.
	Perfluorotridecanoic acid (PFTrDA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low and EIS %R less than 50%. MS/MSD %R; low bias
	8:2 FTS N-EtFOSAA N-MeFOSAA Perfluorobutane sulfonic acid (PFBS) Perfluorobutanoic acid (PFBA) Perfluorodecanoic acid (PFDA) Perfluoroheptanoic acid (PFHpA) Perfluorohexane sulfonic acid (PFHxS) Perfluorohexanoic acid (PFHxA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.

Sample Locations	Compound	Qualifier	Reason
LHAAP-HWSA-GW-01-112922 (continued)	Perfluorononanoic acid (PFNA) Perfluorooctanoic acid (PFOA) Perfluoropentanoic acid (PFPeA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.
	6:2 FTS Perfluorooctane sulfonic acid (PFOS) Perfluoroundecanoic acid (PFUdA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low. MS/MSD RPD
LHAAP-47WW49-113022	6:2 FTS	J-	EIS %R greater than 150%.
	Perfluorododecanoic acid (PFDoA) Perfluorotetradecanoic acid (PFTeDA) Perfluorotridecanoic acid (PFTrDA)	UJ	EIS %R less than 50%.
LHAAP-46WW02-113022	Perfluorobutanoic acid (PFBA) Perfluorotetradecanoic acid (PFTeDA)	UJ	EIS %R less than 50%.
LHAAP-47WW19-113022 LHAAP-CSA-GW-01-112922 LHAAP-FD-4-GW-112922	Perfluorotetradecanoic acid (PFTeDA)	UJ	EIS %R less than 50%.
LHAAP-47WW42-113022	Perfluorobutanoic acid (PFBA)	J-	MS %R; low bias
LHAAP-47WW48-112922	Perfluorododecanoic acid (PFDoA) Perfluorotetradecanoic acid (PFTeDA) Perfluorotridecanoic acid (PFTrDA)	UJ	EIS %R less than 50%.
LHAAP-LHSMW23R-112822	Perfluorobutanoic acid (PFBA)	R	Extracted Internal Standard (EIS) %R less than 20%.
LHAAP-FD-6-GW-112922	Perfluorotetradecanoic acid (PFTeDA)	R	Due to sample matrix, full sample volume not used. Sample container not rinsed and EIS %R less than 20%
	Perfluorododecanoic acid (PFDoA) Perfluorotridecanoic acid (PFTrDA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low and EIS %R less than 50%.
	6:2 FTS 8:2 FTS N-EtFOSAA N-MeFOSAA Perfluorobutane sulfonic acid (PFBS) Perfluorobutanoic acid (PFBA) Perfluorodecanoic acid (PFDA) Perfluoroheptanoic acid (PFHpA) Perfluorohexanoic acid (PFHxA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.

Sample Locations	Compound	Qualifier	Reason
LHAAP-FD-6-GW-112922 (continued)	Perfluorononanoic acid (PFNA) Perfluorooctane sulfonic acid (PFOS) Perfluorooctanoic acid (PFOA) Perfluoropentanoic acid (PFPeA) Perfluoroundecanoic acid (PFUdA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.
LHAAP-LHSMW23R-112822	Perfluoropentanoic acid (PFPeA)	J+	EIS %R less than 50%.
	Perfluoroheptanoic acid (PFHpA)	UJ	CCV %D; high bias
LHAAP-LHSMW25-112822	Perfluoroheptanoic acid (PFHpA)	UJ	CCV %D; high bias
LHAAP-PA3-SO-04-112822	8:2 FTS	UJ	CCV %D; high bias
LHAAP-PA3-SO-01-112822	TOC	J-	Hold Time Exceedance
LHAAP-BG3-DEB-4-010623	Perfluorobutanoic acid (PFBA)	UJ	EIS %R less than 50%.
LHAAP-PA3-DEB-5-010523	Perfluorobutanoic acid (PFBA)	J+	LCS %R; high bias
LHAAP-PWTP-DEB-6-010523	8:2 FTS N-EtFOSAA N-MeFOSAA Perfluorobutane sulfonic acid (PFBS) Perfluorohexane sulfonic acid (PFHxS) Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid (PFDoA) Perfluorotetradecanoic acid (PFTeDA) Perfluorotridecanoic acid (PFTrDA) Perfluoroundecanoic acid (PFUdA)	UJ	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.
	Perfluoroheptanoic acid (PFHpA) Perfluorohexanoic acid (PFHxA) Perfluorononanoic acid (PFNA) Perfluorooctanoic acid (PFOA) Perfluoropentanoic acid (PFPeA) Perfluorooctane sulfonic acid (PFOS)	J-	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low.
	6: FTS	J-	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low and EIS %R greater than 150%

Sample Locations	Compound	Qualifier	Reason
LHAAP-PWTP-DEB-6-010523 (continued)	Perfluorobutanoic acid (PFBA)	J+	Due to sample matrix, full sample volume not used. Sample container not rinsed. Results may be biased low and EIS %R less than 50%.

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation.

J+ (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation. Result may be biased high.

J- (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however, the reported concentration is estimated due to non-conformances discovered during data validation. Result may be biased low.

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however, the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

UB (Blank contamination): The compound or analyte was found in an associated blank above one half the LOQ, as well as in the sample. Compound considered non-detect at the listed value.

X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

R The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Rejection of the data was decided by the project team and USACE chemist.

Attachment A

Data Validation Reports

ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS), Total Organic Carbon and Soil pH Analyses

SDGs # XK21004 and 22112307

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

Report # 48015R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # XK21004 and 22112307 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-HWSA-SO-02-111222	XK21004-001	Soil	11/12/2022		X		
LHAAP-LHSMW21-111222	XK21004-002	Water	11/12/2022		X		
LHAAP-LHSMW19-111222	XK21004-003	Water	11/12/2022		X		
LHAAP-HWSA-SO-01-111222	XK21004-004	Soil	11/12/2022		X	X	X
LHAAP-CSA-SO-01-111422	XK21004-005	Soil	11/14/2022		X		
LHAAP-CSA-SO-02-111422	XK21004-006	Soil	11/14/2022		X		
LHAAP-FD-3-SO-111422	XK21004-007	Soil	11/14/2022	LHAAP-CSA-SO-02-111422	X		
LHAAP-CSA-SO-02-111422	XK21004-008	Soil	11/14/2022		X	X	X
LHAAP-HWSA-SO-03-111222	XK21004-009	Soil	11/12/2022		X		
LHAAP-FD-1-111422	XK21004-010	Water	11/14/2022	LHAAP-35AWW06-111422	X		
LHAAP-35AWW06-111422	XK21004-011	Water	11/14/2022		X		
LHAAP-50WW12-111422	XK21004-012	Water	11/14/2022		X		
LHAAP-35AWW06-111422	XK21004-013	Water	11/14/2022		X		
LHAAP-VWR-SO-03-111422	XK21004-014	Soil	11/14/2022		X		
LHAAP-CSA-SO-03-111422	XK21004-015	Soil	11/14/2022		X		
LHAAP-PA3-SO-07-111422	XK21004-016	Soil	11/14/2022		X		
LHAAP-50WW13-111422	XK21004-017	Water	11/14/2022		X		
LHAAP-PA2-SO-01-111522	XK21004-018	Soil	11/15/2022		X		
LHAAP-PA2-SO-04-111522	XK21004-019	Soil	11/15/2022		X		
LHAAP-12WW01-111522	XK21004-020	Water	11/15/2022		X		
LHAAP-12WW02-111522	XK21004-021	Water	11/15/2022		X		
LHAAP-120-111522	XK21004-022	Water	11/15/2022		X		
LHAAP-MW1-111522	XK21004-023	Water	11/15/2022		X		

DATA REVIEW REPORT

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-18CPTMW23-111522	XK21004-024	Water	11/15/2022		X		
LHAAP-PA2-SO-03-111522	XK21004-025	Soil	11/15/2022		X		
LHAAP-PA2-SO-05-111522	XK21004-026	Soil	11/15/2022		X		
LHAAP-16WW36-111622	XK21004-027	Water	11/16/2022		X		
LHAAP-12WW24-111622	XK21004-028	Water	11/16/2022		X		
LHAAP-MW3-111622	XK21004-029	Water	11/16/2022		X		
LHAAP-18CPTMW04-111622	XK21004-030	Water	11/16/2022		X		
LHAAP-16WW13-111622	XK21004-031	Water	11/16/2022		X		
LHAAP-16WW16-111622	XK21004-032	Water	11/16/2022		X		
LHAAP-MW2-111622	XK21004-033	Water	11/16/2022		X		
LHAAP-016-DEB-2-111622	XK21004-034	Water	11/16/2022		X		
LHAAP-012-DEB-1-111622	XK21004-035	Water	11/16/2022		X		

Notes:

1. Stage 4 validation was performed on sample locations LHAAP-12WW01-111522, LHAAP-MW1-111522 and LHAAP-16WW13-111622.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample locations LHAAP-CSA-SO-02-111422 (XK21004-008) and LHAAP-35AWW06-111422 (XK21004-013).

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

1. The sample ID LHAAP-CSA-SO-02-111422 listed twice on chain of custody as XK21004-006 and 008. Hence, the laboratory reported results for XK21004-008.

2. The sample ID LHAAP-35AWW06-111422 listed twice on chain of custody as XK21004-011 and XK21004-013 with same collection date (11/11/2022) but five minutes difference in collection time 09:50 & 09:55 respectively. The laboratory reported both sample results as non-detect and the laboratory sample id XK21004-013 analyzed for MS/MSD analysis. Hence, the laboratory sample id XK21004-013 reported results considered in this report.

3. As per project team communication the following sample ID LHAAP-CSA-DUP01 (XK21004-007) corrected as LHAAP-FD-3-SO-111422.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; “The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report.” Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard must be within 70-130% of their true value.

The initial calibration, and initial calibration verification standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the initial and continuing calibrations were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	EIS	Associated Compounds	%R	RE %R
LHAAP-FD-1-111422 LHAAP-35AWW06-111422	13C2_6:2FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	>UL	NA
	13C2_8:2FTS	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	>UL	NA
LHAAP-CSA-SO-03-111422 LHAAP-PA2-SO-01-111522	13C8_PFOA	Perfluoro-n-octanoic acid (PFOA)	>UL	NA
LHAAP-PA2-SO-04-111522	13C2_8:2FTS	1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	>UL	NA
	13C8_PFOA	Perfluoro-n-octanoic acid (PFOA)	>UL	NA
LHAAP-12WW01-111522	13C2_6:2FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	>UL	NA
	13C4_PFBA	Perfluoro-n-butanoic acid (PFBA)	< 50% but > 20%	NA
LHAAP-120-111522	13C4_PFBA	Perfluoro-n-butanoic acid (PFBA)	< 50% but > 20%	NA
LHAAP-PA2-SO-03-111522	13C8_PFOA	Perfluoro-n-octanoic acid (PFOA)	>UL	NA
LHAAP-12WW24-111622	13C4_PFBA	Perfluoro-n-butanoic acid (PFBA)	**< 50% but > 20%**	< 50% but > 20%
LHAAP-MW3-111622	13C2_6:2FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	>UL	NA
LHAAP-16WW13-111622	13C4_PFBA	Perfluoro-n-butanoic acid (PFBA)	< 50% but > 20%	NA

Sample Locations	EIS	Associated Compounds	%R	RE %R
LHAAP-16WW16-111622 LHAAP-MW2-111622	13C2_6:2FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	>UL	NA
LHAAP-012-DEB-1-111622	13C4_PFBA	Perfluoro-n-butanoic acid (PFBA)	< 50% but > 20%	NA

Note:
NA Not applicable

Where a re-extracted analysis was performed, results are reported from the analysis in bold above.

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample locations LHAAP-CSA-SO-02-111422 and LHAAP-35AWW06-111422 exhibited recoveries and RPD between recoveries within the control limits.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three time the LOQ for soil matrices.

DATA REVIEW REPORT

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compounds	Sample Result	Duplicate Result	RPD
LHAAP-CSA-SO-02-111422 / LHAAP-FD-3-SO-111422	All target compounds	U	U	AC
LHAAP-35AWW06-111422 / LHAAP-FD-1-111422	All target compounds	U	U	AC

Note:
AC Acceptable

The results between the parent samples and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
LHAAP-16WW13-111622	Perfluoro-n-octanoic acid (PFOA)	600 E	620 M	620 D

10. System Performance and Overall Assessment

The case narrative notes that for samples LHAAP-FD-1-111422, LHAAP-50WW12-111422, LHAAP-35AWW06-111422, LHAAP-12WW01-111522, LHAAP-12WW02-111522, LHAAP-120-111522, LHAAP-MW1-111522, LHAAP-18CPTMW23-111522, LHAAP-16WW13-111622, LHAAP-016-DEB-2-111622 and LHAAP-012-DEB-1-111622 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; sample was spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH each. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using MeOH by transfer pipet. Hence, the target compounds were not qualified for the sample preparation modification for these samples.

The case narrative notes that for samples LHAAP-12WW24-111622 and LHAAP-18CPTMW04-111622 the sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Therefore, all PFAS compounds are qualified as estimated (UJ,J-) for these samples.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to "M" and preserved with the data as informational data for

the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 9045D and 9060A. Data were reviewed in accordance with Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - J The reported value was obtained from a reading less than the limit of detection (LOQ), but greater than or equal to the detection limit (DL).
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Total Organic Carbon (TOC) by SW846 9060A	Soil	28 days from collection to analysis	Cool to <6 °C.
pH by SW846 9045D	Soil	Within 24 hours of receipt at laboratory	Cool to <6 °C.

The analyses that exceeded the holding time are presented in the following table.

Sample Locations	Holding Time	Criteria
LHAAP-HWSA-SO-01-111222	20 days from collection; 9 days from receipt	Within 24 hours of receipt at laboratory
LHAAP-CSA-SO-02-111422	18 days from collection; 7 days from receipt	

Sample results associated with sample locations analyzed by analytical method SW-846 9045D were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification
	Detected Analytes
Analysis completed past holding time	J

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

TOC was not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

pH: The initial and continuing calibration criteria were within the acceptance criteria of ± 0.05 SU of the true value.

TOC calibration standard recoveries were within control limits of 90 to 110%.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater.

A MS analysis was not performed for TOC.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the LOQ. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of one time the LOQ is applied for water matrices and two times the LOQ for soil matrices. The laboratory duplicate control limits for soil pH is ≤ 0.1 su.

A laboratory duplicate analysis was not performed on sample location associated with this SDG.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of three times the LOQ is applied for soil matrices.

A field duplicate was not collected for TOC and pH analysis.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

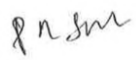
DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW846 9045D/9060A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Lab Duplicate (RPD)	X				X
Field Duplicate (RPD)	X				X
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Initial calibration correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculations acceptable		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:
%R - percent recovery
RPD - relative percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Suresh PR, Arcadis

SIGNATURE: 

DATE: December 23, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: December 23, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XK21004 Date: 12/23/2022
Lab: Pace (Shealy) Page: 1
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3
Instrument : LCMSMS02
PFOA 11/17/2022 Calibration Pg 765-775 of SDG XK21004

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
100	55006	1071723	2000	0.051325	1.0264966	0.981342	104.60	100	104.60	104.6	MATCH
200	108513	1093134	2000	0.099268	0.9926779	0.981342	202.31	200	101.16	101.2	MATCH
500	259250	1098035	2000	0.236104	0.9444143	0.981342	481.19	500	96.24	96.2	MATCH
1000	534719	1099295	2000	0.48642	0.9728399	0.981342	991.34	1000	99.13	99.1	MATCH
2000	1069387	1162536	2000	0.919874	0.9198743	0.981342	1874.73	2000	93.74	93.7	MATCH
5000	2622099	1079474	2000	2.429052	0.971621	0.981342	4950.47	5000	99.01	99	MATCH
10000	5279704	1069444	2000	4.936868	0.9873736	0.981342	10061.46	10000	100.61	100.6	MATCH
15000	7777020	1022343	2000	7.607056	1.0142741	0.981342	15503.37	15000	103.36	103.4	MATCH
20000	10629691	1060313	2000	10.02505	1.002505	0.981342	20431.31	20000	102.16	102.2	MATCH
				Avg RF	0.9813419						

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XK21004 Date: 12/23/2022
Lab: Pace (Shealy) Page: 2
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS02 File ID: 111722017
ICV_1000_SVLC-2298 11/17/2022 14:03:18 Page 983 of SDG XK21004

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBA	928.16	1000	92.82	92.8	MATCH
PFHxA	973.91	1000	97.39	97.4	MATCH
PFHpA	957.91	1000	95.79	95.8	MATCH
PFOA	828.6	1000	82.86	82.9	MATCH

Instrument: LCMSMS02 File ID: 112322005
CCV 200_SVLC-2261 11/23/2022 11:54:41 Page 1007 of SDG XK21004
This CCV applicable for samples LHAAP-12WW01-111522 and LHAAP-MW1-111522

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBA	193.96	200	96.98	97	MATCH
PFHxA	197.29	200	98.65	98.6	MATCH
PFHpA	186.71	200	93.36	93.4	MATCH
PFOA	214.12	200	107.06	107.1	MATCH

Instrument: LCMSMS02 File ID: 112922005
CCV 200_SVLC-2261 11/29/2022 12:19:23 Page 1472 of SDG XK21004
This CCV applicable for sample LHAAP-16WW13-111622

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBA	189.92	200	94.96	95	MATCH
PFHxA	191.36	200	95.68	95.7	MATCH
PFHpA	193.41	200	96.71	96.7	MATCH
PFOA	201.76	200	100.88	100.9	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XK21004 Date: 12/23/2022
Lab: Pace (Shealy) Page: 3
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

LCS XQ60756-002 Pg 2035 of SDG XK21004
Instrument: LCMSMS02 File ID: 112322038 Final volume = 5ml
This LCS applicable for samples LHAAP-12WW01-111522 and LHAAP-MW1-111522

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBA	438980	1078898	2000	0.406878	0.96599	842.41	250	16.85	16	105.30	105	MATCH
PFHxA	478394	1112032	2000	0.430198	0.986821	871.89	250	17.44	16	108.99	109	MATCH
PFHpA	410529	898403	2000	0.456954	1.048577	871.57	250	17.43	16	108.95	109	MATCH
PFOA	429104	1056145	2000	0.406293	0.981342	828.03	251	16.49	16	103.09	104	MATCH

LCS XQ60791-002 Pg 2059 of SDG XK21004
Instrument: LCMSMS02 File ID: 112822059 Final volume = 5ml
This LCS applicable for sample LHAAP-16WW13-111622

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBA	474728	1204377	2000	0.394169	0.96599	816.09	250	16.32	16	102.01	102	MATCH
PFHxA	500807	1201071	2000	0.416967	0.986821	845.07	250	16.90	16	105.63	106	MATCH
PFHpA	424975	934214	2000	0.454901	1.048577	867.65	250	17.35	16	108.46	108	MATCH
PFOA	448883	1147600	2000	0.391149	0.981342	797.17	251	15.88	16	99.25	100	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated amount ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XK21004 Date: 12/23/2022
Lab: Pace (Shealy) Page: 4
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

MS/MSD Sample ID LHAAP-35AWW06-111422 Page 2165 and 2217 SDG XK21004
ANALYTE PFHxA
REPORTED MS %R 101
REPORTED MSD %R 92
REPORTED RPD 1.2

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}} \qquad RPD = \frac{100 * |\text{MS \%R} - \text{MSD \%R}}{\text{Average of MS MSD \%R}}$$

Sample Concentration	0			
MS Concentration	13.7	MS %R	98.00	MATCH
MSD Concentration	13.6	MSD %R	90.41	MATCH
MS TV	14	RPD	1.2	MATCH
MSD TV	15			

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XK21004
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/23/2022
Page: 5
Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-12WW01-111522 Lab ID: XK21004-020 Page 297 of SDG XK21004
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBA	59644	284567	2000	0.209596	0.96599	433.95	5	281.97	7.69	7.7	Match
PFHxA	126456	1071348	2000	0.118034	0.986821	239.22	5	281.97	4.24	4.2	Match
PFHpA	146445	940422	2000	0.155723	1.048577	297.02	5	281.97	5.27	5.3	Match
PFOA	478628	1024873	2000	0.467012	0.981342	951.78	5	281.97	16.88	17	Match

Field Sample: LHAAP-MW1-111522 Lab ID: XK21004-023 Page 297 of SDG XK21004
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBA	108799	690923	2000	0.157469	0.96599	326.03	5	284.1	5.74	5.7	Match
PFHxA	138893	1153311	2000	0.12043	0.986821	244.08	5	284.1	4.30	4.3	Match
PFHpA	141637	884669	2000	0.160102	1.048577	305.37	5	284.1	5.37	5.4	Match
PFOA	720574	1100030	2000	0.655049	0.981342	1335.01	5	284.1	23.50	23	Match

Field Sample: LHAAP-16WW13-111622 Lab ID: XK21004-031 Page 464 of SDG XK21004
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFOA	3588309	215545	2000	16.64761	0.981342	33928.25	5	274.42	618.18	620	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)
Dilution Calculated ng/L = DF x ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #: XK21004 Date: 12/23/2022
Lab: Pace (Shealy) Page: 6
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-12WW01-111522 Lab ID: XK21004-020

EIS 13C8_PFOA
REPORTED EIS %R 106

%R = 100 * EIS Area / CCV 200 EIS Area

EIS Area 1024873 Page 298 of SDG XK21004
CCV 200 EIS Area 966430 Page 1010 of SDG XK21004
%R 106.0 Match

Field Sample: LHAAP-MW1-111522 Lab ID: XK21004-023

EIS 13C4_PFBA
REPORTED EIS %R 64

%R = 100 * EIS Area / CCV 200 EIS Area

EIS Area 690923 Page 340 of SDG XK21004
CCV 200 EIS Area 1088167 Page 1009 of SDG XK21004
%R 63.5 Match

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Pace Analytical

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106 Vantage Point Drive • West Columbia, SC 29172
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Number 140756

Client: United States Army Corps Engineers	Report to Contact: Dana Schmidt	Telephone No. / E-mail: (817) 886-1272 dana.schmidt@arcadis.com	Quote No.
Address: Bunker Dr	Sampler's Signature: x Lyndsey M DeRamus	Analysis (Attach list if more space is needed)	Page 1 of 4
City: Kermit	State: TX	Zip Code: 79745	
Project Name: LHAAP	Printed Name:		

| Project No. 30001997 | P.O. No. | | | Matrix | | | No of Containers by Preservative Type | | |

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Number 140839

Client: United States Army Corps Engineers	Report to Contact: Darryl Schmidt	Telephone No. / E-mail: (601) 634-2772 Darryl.Schmidt@usace.army.mil	Quote No.
Address: Zemorrer Dr.	Sampler's Signature: x Darryl Schmidt	Analysis (Attach list if more space is needed)	Page 2 of 4
City: Kosciusko State: MS Zip Code: 39090	Printed Name: Darryl Schmidt	PFAS ISOS	XK21004 KES2
Project Name: LHAAP			
Project No.: 30001997	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HNO3	HCl	NaOH	H2SO4	NaHSO4	Other (Specify)	Remarks / Cooler I.D.
LHAAP-35A-WW06-111422	11/14/22	0950	G	X										
LHAAP-50-WW12-11142022	11/14/22	1055	G	X										
LHAAP-35A-WW06-111422	11/14/22	0955	G	X										MS, MSD
LHAAP-VMF-SD-03	11/14/22	0940	C		X									
LHAAP-CSA-SD-02	11/14/22	1145	G		X									
LHAAP-PA3-SD-07	11/14/22	0955	C		X									
LHAAP-50-WW13-11142022	11/14/22	1140	G	X										

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)	Sample Disposal: ☐ Return to Client ☑ Disposal by Lab	Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown		QC Requirements (Specify)	
1. Relinquished by: [signature]	Date: 11/17/22	Time: 0800	1. Received by	Date	Time
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FEDEX	Date: 11/21/22	Time: 0950	4. Laboratory received by: [signature] Overnight	Date: 11/21/22	Time: 0950
Note: All samples are retained for four weeks from receipt unless other arrangements are made.			LAB USE ONLY Received on Ice (Circle): (Yes) No Ice Pack: Receipt Temp: 2.4 °C 5.9		Temp Blank: ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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Number 140755

Client: United States Army Corps of Engineers
Address: Savannah
City: Kathwick State: TX Zip Code: 75601
Project Name: LHAAP
Project No.: 3861997
P.O. No.:
Report to Contact:
Sampler's Signature: x Lyndsaym Deramus
Printed Name:
Telephone No. / E-mail: (618) 346-1242 deramuslm@...
Analysis (Attach list if more space is needed): SVOCs 8270
Quote No.:
Page 3 of 4

XK21004
KES2

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab/Composite	Matrix: Aqueous	Soil	Other	No of Containers by Preservative Type: Unpres	HNO3	HCl	NaOH	Na2S2O3	Field Filtered	Remarks / Cooler I.D.
LHAAP-PA2-SD-01	11/15/22	16:40	C		X								
LHAAP-PA2-SD-04	11/15/22	9:00	C		X								
LHAAP-12MW01-111522	11/15/22	16:45	G	X									
LHAAP-12MW02-111522	11/15/22	16:05	G	X									
LHAAP-120-11152022	11/15/22	11:35	G	X									
LHAAP-MW-1-11152222	11/15/22	14:55	G	X									
LHAAP-18CPTMW23-111522	11/15/22	13:20	G	X									
LHAAP-PA2-SD-03	11/15/22	16:15	C		X								
LHAAP-PA2-SD-05	11/15/22	09:20	C		X								
LHAAP-16MW36-111622	11/16/22	15:50	G	X									

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)
Sample Disposal: ☐ Return to Client ☑ Dispose by Lab
Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown
QC Requirements (Specify):

	Date	Time
1. Relinquished by: Lyndsaym Deramus	11/18/22	0800
2. Relinquished by:	Date	Time
3. Relinquished by:	Date	Time
4. Relinquished by: FedEx	11/21/22	0950

	Date	Time
1. Received by:		
2. Received by:	Date	Time
3. Received by:	Date	Time
4. Laboratory received by: Brooke Mountcastle	11/21/22	0950

Temp Blank: Y / N
LAB USE ONLY — Received on Ice (Circle): (Yes) No Ice Pack
Receipt Temp: 2.1 °C
5.9

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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Number 139211

Client: United States Army Corps Engineers	Report to Contact: Dana Schmidt	Telephone No. / Email: (817) 886 1272 Dana.s.schmidt@usace.army.mil	Quote No.
Address: 2219 Viner, Dr.	Sampler's Signature: x Dana Schmidt-DeRamus	Analysis (Attach list if more space is needed)	Page 4 of 4
City: Kennick State: TX Zip Code: 75601	Printed Name	PLEASE EMAIL RESULTS	XK21004
Project Name: LHAAP			KES2
Project No.: 300015917	P.O. No.		Remarks / Cooler I.D.

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab or Composite	Matrix: Aqueous	Matrix: Soil	Matrix: Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Field Filtered
LHAAP-12MW24-111622	11/16/22	12:30	G	X									
LHAAP-MW3-111622	11/16/22	14:00	G	X									
LHAAP-18CPTMW04-111622	11/16/22	15:30	G	X									
LHAAP-16MW13-111622	11/16/22	17:00	G	X									
LHAAP-16MW16-111622	11/16/22	14:55	G	X									
LHAAP-MW2-111622	11/16/22	10:30	G	X									
LHAAP-01IC-DEB-2-111622	11/16/22	12:40	G	X									
LHAAP-012-DEB-1-111622	11/16/22	11:55	G	X									

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Dana Schmidt-DeRamus	11/17/22	0800	1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	Date 11/21/22	Time 0950	4. Laboratory received by: overnight	Date 11/21/22	Time 0950

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle) (Yes) No Ice Pack
Receipt Temp. 2.4 °C
5.9
Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: MS02IN2-01

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-001
Description: LHAAP-HWSA-SO-02-111222
Matrix: Solid
Date Sampled: 11/12/2022 0915
Project Name: LHAAP
% Solids: 81.6 11/25/2022 1752
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2039	ALM	11/23/2022 1202	60891

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	UM-03 U	0.0010	0.00050	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		108	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		101	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		106	50-150
13C8_PFOS		109	50-150
13C9_PFNA		103	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		104	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-002	
Description: LHAAP-LHSMW21-111222		Matrix: Aqueous	
Date Sampled: 11/12/2022 1105	Project Name: LHAAP		
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1535	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		125	50-150
13C2_8:2FTS		106	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		105	50-150
13C3_PFBS		111	50-150
13C3_PFHxS		105	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		104	50-150
13C8_PFOA		113	50-150
13C8_PFOS		108	50-150
13C9_PFNA		109	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		114	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-003	
Description: LHAAP-LHSMW19-111222		Matrix: Aqueous	
Date Sampled: 11/12/2022 1215	Project Name: LHAAP		
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1546	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.6	J	3.9	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	UM-03 U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	UM-03 U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.6	JM-03 JM	3.9	2.0	0.99	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		126	50-150
13C2_8:2FTS		104	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		100	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		52	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		109	50-150
13C8_PFOS		109	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Inorganic non-metals

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-004	
Description: LHAAP-HWSA-SO-01-111222		Matrix: Solid	
Date Sampled: 11/12/2022 0845	Project Name: LHAAP	% Solids: 83.4	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013	J	

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/02/2022 1348	BMG2		61557

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 16.5 ° C		9045D	5.4	J				su	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-004	
Description: LHAAP-HWSA-SO-01-111222		Matrix: Solid	
Date Sampled: 11/12/2022 0845	Project Name: LHAAP	% Solids: 83.4	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1802	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		104	50-150
13C2_8:2FTS		123	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		115	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		98	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		128	50-150
13C8_PFOS		104	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		113	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-005	
Description: LHAAP-CSA-SO-01-111422		Matrix: Solid	
Date Sampled: 11/14/2022 1035	Project Name: LHAAP	% Solids: 88.4	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1812	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		111	50-150
13C2_8:2FTS		118	50-150
13C2_PFDoA		108	50-150
13C2_PFTeDA		118	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		111	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		107	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		108	50-150
13C8_PFOS		128	50-150
13C9_PFNA		112	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		104	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-007	
Description: LHAAP-FD-3-SO-111422		Matrix: Solid	
Date Sampled: 11/14/2022	Project Name: LHAAP	% Solids: 88.0	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1844	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		117	50-150
13C2_8:2FTS		126	50-150
13C2_PFDoA		105	50-150
13C2_PFTeDA		117	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		114	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		107	50-150
13C7_PFUdA		111	50-150
13C8_PFOA		148	50-150
13C8_PFOS		114	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		104	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Inorganic non-metals

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-008	
Description: LHAAP-CSA-SO-02-111422		Matrix: Solid	
Date Sampled: 11/14/2022 1050	Project Name: LHAAP	% Solids: 87.1	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

J

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/02/2022 1350	BMG2		61557

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 16.9 ° C		9045D	5.4	J				su	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-008	
Description: LHAAP-CSA-SO-02-111422		Matrix: Solid	
Date Sampled: 11/14/2022 1050	Project Name: LHAAP	% Solids: 87.1	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1855	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		110	50-150
13C2_8:2FTS		135	50-150
13C2_PFDoA		108	50-150
13C2_PFTeDA		122	50-150
13C3_PFBS		119	50-150
13C3_PFHxS		130	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		114	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		149	50-150
13C8_PFOS		117	50-150
13C9_PFNA		119	50-150
d5-EtFOSAA		110	50-150
d3-MeFOSAA		116	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-009	
Description: LHAAP-HWSA-SO-03-111222		Matrix: Solid	
Date Sampled: 11/12/2022 0830	Project Name: LHAAP	% Solids: 85.4	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1927	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		104	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		121	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		111	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		122	50-150
13C8_PFOS		104	50-150
13C9_PFNA	M-03	97	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-010
Description: LHAAP-FD-1-111422
Matrix: Aqueous
Date Sampled: 11/14/2022
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1557	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q		LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	UQ	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	UQ	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U		7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U		7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	247	50-150
13C2_8:2FTS	N	231	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		94	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		104	50-150
13C8_PFOA		108	50-150
13C8_PFOS		114	50-150
13C9_PFNA		124	50-150
d5-EtFOSAA		125	50-150
d3-MeFOSAA		120	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-011
Description: LHAAP-35AWW06-111422
Matrix: Aqueous
Date Sampled: 11/14/2022 0950
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1608	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	UQ	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UQ	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	257	50-150
13C2_8:2FTS	N	240	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		104	50-150
13C4_PFBA		85	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		119	50-150
13C7_PFUdA		104	50-150
13C8_PFOA		110	50-150
13C8_PFOS		113	50-150
13C9_PFNA		122	50-150
d5-EtFOSAA		121	50-150
d3-MeFOSAA		128	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-012	
Description: LHAAP-50WW12-111422		Matrix: Aqueous	
Date Sampled: 11/14/2022 1055	Project Name: LHAAP		
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1619	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	UM-03 U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		133	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		114	50-150
13C3_PFHxS		104	50-150
13C4_PFBA		83	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		112	50-150
13C5_PFPeA		109	50-150
13C6_PFDA		94	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		117	50-150
13C8_PFOS		109	50-150
13C9_PFNA		115	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-013
Description: LHAAP-35AWW06-111422
Matrix: Aqueous
Date Sampled: 11/14/2022 0955
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2050	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q		LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	UQ	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U		7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U		7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	270	50-150
13C2_8:2FTS	N	256	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		105	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		113	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		114	50-150
13C8_PFOS		118	50-150
13C9_PFNA		121	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		133	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-014	
Description: LHAAP-VWR-SO-03-111422		Matrix: Solid	
Date Sampled: 11/14/2022 0940	Project Name: LHAAP	% Solids: 83.8	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1937	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		113	50-150
13C2_8:2FTS		124	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		118	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		121	50-150
13C4_PFBA		112	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		107	50-150
13C6_PFDA	M-03	99	50-150
13C7_PFUdA		108	50-150
13C8_PFOA		128	50-150
13C8_PFOS	M-03	116	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA	M-03	105	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-015	
Description: LHAAP-CSA-SO-03-111422		Matrix: Solid	
Date Sampled: 11/14/2022 1145	Project Name: LHAAP	% Solids: 83.0	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1948	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00059	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00059	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00059	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00059	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	UQ	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		125	50-150
13C2_8:2FTS		122	50-150
13C2_PFDoA		113	50-150
13C2_PFTeDA		137	50-150
13C3_PFBS		124	50-150
13C3_PFHxS		138	50-150
13C4_PFBA		124	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		118	50-150
13C6_PFDA		118	50-150
13C7_PFUdA		118	50-150
13C8_PFOA	N	157	50-150
13C8_PFOS		127	50-150
13C9_PFNA	M-03	129	50-150
d5-EtFOSAA		117	50-150
d3-MeFOSAA		120	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-016	
Description: LHAAP-PA3-SO-07-111422		Matrix: Solid	
Date Sampled: 11/14/2022 0855	Project Name: LHAAP	% Solids: 88.5	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 1958	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		109	50-150
13C2_8:2FTS		124	50-150
13C2_PFDoA		114	50-150
13C2_PFTeDA		131	50-150
13C3_PFBS		112	50-150
13C3_PFHxS		132	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		118	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		113	50-150
13C8_PFOA		141	50-150
13C8_PFOS		108	50-150
13C9_PFNA		117	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-017
Description: LHAAP-50WW13-111422
Matrix: Aqueous
Date Sampled: 11/14/2022 1140
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1630	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	UM-03	3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	UM-03	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	22	M-03	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		114	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		96	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		103	50-150
13C4_PFBA		66	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		87	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		115	50-150
13C8_PFOS		104	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-018	
Description: LHAAP-PA2-SO-01-111522		Matrix: Solid	
Date Sampled: 11/15/2022 1640	Project Name: LHAAP	% Solids: 73.5	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2009	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00065	UQ	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		136	50-150
13C2_8:2FTS		148	50-150
13C2_PFDoA		115	50-150
13C2_PFTeDA		150	50-150
13C3_PFBS		121	50-150
13C3_PFHxS		133	50-150
13C4_PFBA		125	50-150
13C4_PFHpA		124	50-150
13C5_PFHxA		112	50-150
13C5_PFPeA		122	50-150
13C6_PFDA		123	50-150
13C7_PFUdA		134	50-150
13C8_PFOA	N	157	50-150
13C8_PFOS		124	50-150
13C9_PFNA		129	50-150
d5-EtFOSAA		131	50-150
d3-MeFOSAA		128	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-019
Description: LHAAP-PA2-SO-04-111522
Matrix: Solid
Date Sampled: 11/15/2022 0900
Project Name: LHAAP
% Solids: 77.4 11/25/2022 1752
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2020	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	UQ	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	UQ	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		137	50-150
13C2_8:2FTS	N	163	50-150
13C2_PFDoA		143	50-150
13C2_PFTeDA		145	50-150
13C3_PFBS		128	50-150
13C3_PFHxS		150	50-150
13C4_PFBA		130	50-150
13C4_PFHpA		124	50-150
13C5_PFHxA		110	50-150
13C5_PFPeA		121	50-150
13C6_PFDA		127	50-150
13C7_PFUdA		132	50-150
13C8_PFOA	N	151	50-150
13C8_PFOS		132	50-150
13C9_PFNA		139	50-150
d5-EtFOSAA		136	50-150
d3-MeFOSAA		121	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-020
Description: LHAAP-12WW01-111522
Matrix: Aqueous
Date Sampled: 11/15/2022 1645
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1703	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	UQ	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	UM-03	3.5	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	7.7	Q	3.5	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.3	M-03	3.5	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.2	M-03	3.5	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17	M-03	3.5	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.4	JM-03	3.5	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	152	50-150
13C2_8:2FTS		121	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA	M-03	50	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		99	50-150
13C4_PFBA	N	26	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		97	50-150
13C5_PFPeA		62	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		106	50-150
13C8_PFOS		110	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		102	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-021
Description: LHAAP-12WW02-111522
Matrix: Aqueous
Date Sampled: 11/15/2022 1605
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1714	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	13		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	UM-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	3.8	M-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		115	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		107	50-150
13C4_PFBA	M-03	50	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		81	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		104	50-150
13C8_PFOS		103	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Description: LHAAP-120-111522
Date Sampled: 11/15/2022 1135
Date Received: 11/21/2022
Laboratory ID: XK21004-022
Matrix: Aqueous
Project Name: LHAAP
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1725	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	UQ	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	7.1	M-03	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	3.4	JM-03	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		146	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		100	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		105	50-150
13C4_PFBA	N	41	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		75	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		109	50-150
13C8_PFOS		118	50-150
13C9_PFNA		116	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		111	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
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J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-023
Description: LHAAP-MW1-111522
Matrix: Aqueous
Date Sampled: 11/15/2022 1455
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/23/2022 1736	ALM	11/22/2022 0848	60756

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	7.9		7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.5		3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.2	JM-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	5.7		3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.4	M-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.3		3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	23	M-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	3.8	M-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.9	JM-03	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		119	50-150
13C2_8:2FTS		101	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		99	50-150
13C4_PFBA		64	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		90	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		114	50-150
13C8_PFOS		108	50-150
13C9_PFNA		103	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-024
Description: LHAAP-18CPTMW23-111522
Matrix: Aqueous
Date Sampled: 11/15/2022 1320
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2123	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q		LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U		6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U		6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U		6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U		6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	UM-03	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	UM-03	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	UM-03	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	5.2	M-03	M	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U		3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		142	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		84	50-150
13C2_PFTeDA		82	50-150
13C3_PFBS		108	50-150
13C3_PFHxS		116	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		115	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		117	50-150
13C8_PFOS		96	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-025	
Description: LHAAP-PA2-SO-03-111522		Matrix: Solid	
Date Sampled: 11/15/2022 1615	Project Name: LHAAP	% Solids: 86.1	11/29/2022 0102
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2030	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00049	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00049	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00049	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00049	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00049	UQ	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00049	U	0.00098	0.00049	0.00020	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		125	50-150
13C2_8:2FTS		140	50-150
13C2_PFDoA		116	50-150
13C2_PFTeDA		140	50-150
13C3_PFBS		128	50-150
13C3_PFHxS		129	50-150
13C4_PFBA		118	50-150
13C4_PFHpA		121	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		121	50-150
13C6_PFDA		124	50-150
13C7_PFUdA		115	50-150
13C8_PFOA	N	157	50-150
13C8_PFOS		122	50-150
13C9_PFNA		123	50-150
d5-EtFOSAA		119	50-150
d3-MeFOSAA		131	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21004-026	
Description: LHAAP-PA2-SO-05-111522		Matrix: Solid	
Date Sampled: 11/15/2022 0920	Project Name: LHAAP	% Solids: 75.0	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2041	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0013	U	0.0025	0.0013	0.00063	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00065	U	0.0013	0.00065	0.00025	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		126	50-150
13C2_8:2FTS		129	50-150
13C2_PFDoA		104	50-150
13C2_PFTeDA		120	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		129	50-150
13C4_PFBA		115	50-150
13C4_PFHpA		118	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		107	50-150
13C8_PFOA		124	50-150
13C8_PFOS		108	50-150
13C9_PFNA		114	50-150
d5-EtFOSAA		111	50-150
d3-MeFOSAA		114	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-027
Description: LHAAP-16WW36-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1550
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2135	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	40	U	80	40	20	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	40	U	80	40	20	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	40	U	80	40	20	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	40	U	80	40	20	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	20	UM-03 U	40	20	10	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	20	UM-03 U	40	20	10	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	95	M-03 M	40	20	10	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	20	U	40	20	10	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	20	UM-03 U	40	20	10	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		127	50-150
13C2_8:2FTS		121	50-150
13C2_PFDoA		113	50-150
13C2_PFTeDA		110	50-150
13C3_PFBS		119	50-150
13C3_PFHxS		112	50-150
13C4_PFBA		118	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		114	50-150
13C5_PFPeA		115	50-150
13C6_PFDA		107	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		117	50-150
13C8_PFOS		124	50-150
13C9_PFNA		121	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		117	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-028
Description: LHAAP-12WW24-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1230
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2146	ALM	11/22/2022 1206	60791
2	SOP SPE	PFAS by ID SOP QSM B-15	1	12/01/2022 2108	BWS	11/30/2022 1203	61315

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	UM-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.3	JQ	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	UM-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.2	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	UM-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	10	M-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		144	50-150		105	50-150
13C2_8:2FTS		119	50-150		91	50-150
13C2_PFDoA		97	50-150		82	50-150
13C2_PFTeDA		101	50-150		83	50-150
13C3_PFBS		88	50-150		75	50-150
13C3_PFHxS		122	50-150		92	50-150
13C4_PFBA	M-03N	45	50-150	N	32	50-150
13C4_PFHpA		112	50-150		68	50-150
13C5_PFHxA		104	50-150		82	50-150
13C5_PFPeA		84	50-150		67	50-150
13C6_PFDA		100	50-150		92	50-150
13C7_PFUdA		102	50-150		95	50-150
13C8_PFOA		120	50-150		86	50-150
13C8_PFOS		113	50-150		91	50-150
13C9_PFNA		116	50-150		82	50-150
d5-EtFOSAA		95	50-150		94	50-150
d3-MeFOSAA		114	50-150		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-028
Description: LHAAP-12WW24-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1230
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2146	ALM	11/22/2022 1206	60791
2	SOP SPE	PFAS by ID SOP QSM B-15	1	12/01/2022 2108	BWS	11/30/2022 1203	61315

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.5	U	9.0	4.5	2.2	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.5	U	9.0	4.5	2.2	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.5	U	9.0	4.5	2.2	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.5	U	9.0	4.5	2.2	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.3	UM-03	4.5	2.3	1.1	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.3	UM-03	4.5	2.3	1.1	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.3	UQ	4.5	2.3	1.1	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.6	JM-03	4.5	2.3	1.1	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	14	M-03	4.5	2.3	1.1	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.3	U	4.5	2.3	1.1	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		144	50-150		105	50-150
13C2_8:2FTS		119	50-150		91	50-150
13C2_PFDoA		97	50-150		82	50-150
13C2_PFTeDA		101	50-150		83	50-150
13C3_PFBS		88	50-150		75	50-150
13C3_PFHxS		122	50-150		92	50-150
13C4_PFBA	M-03N	45	50-150	N	32	50-150
13C4_PFHpA		112	50-150		68	50-150
13C5_PFHxA		104	50-150		82	50-150
13C5_PFPeA		84	50-150		67	50-150
13C6_PFDA		100	50-150		92	50-150
13C7_PFUdA		102	50-150		95	50-150
13C8_PFOA		120	50-150		86	50-150
13C8_PFOS		113	50-150		91	50-150
13C9_PFNA		116	50-150		82	50-150
d5-EtFOSAA		95	50-150		94	50-150
d3-MeFOSAA		114	50-150		82	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XK21004-029
Description: LHAAP-MW3-111622	Matrix: Aqueous
Date Sampled: 11/16/2022 1400	Project Name: LHAAP
Date Received: 11/21/2022	Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2219	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UQ	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	JM-03	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.6	M-03	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.1	M-03	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	9.3		3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	42	M-03	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	163	50-150
13C2_8:2FTS		146	50-150
13C2_PFDoA		125	50-150
13C2_PFTeDA		114	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		120	50-150
13C4_PFBA		75	50-150
13C4_PFHpA		119	50-150
13C5_PFHxA		115	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		115	50-150
13C8_PFOA		122	50-150
13C8_PFOS		127	50-150
13C9_PFNA		126	50-150
d5-EtFOSAA		115	50-150
d3-MeFOSAA		131	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-030
Description: LHAAP-18CPTMW04-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1530
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2230	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	3.5	J	3.7	1.9	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.4	JM-03	3.7	1.9	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.9		3.7	1.9	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	4.5		3.7	1.9	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.8	M-03	3.7	1.9	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	22	M-03	3.7	1.9	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.4	JM-03	3.7	1.9	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.8	JM-03	3.7	1.9	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		139	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		69	50-150
13C2_PFTeDA		65	50-150
13C3_PFBS		114	50-150
13C3_PFHxS		116	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		114	50-150
13C5_PFPeA		114	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		117	50-150
13C8_PFOS		123	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-031
Description: LHAAP-16WW13-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1700
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2241	ALM	11/22/2022 1206	60791
2	SOP SPE	PFAS by ID SOP QSM B-15	5	11/29/2022 1409	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4.6	M-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.5	JQM-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	7.2	M-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	4.2		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	600	E	3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	5.5	M-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	8.2	M-03	3.6	1.8	0.91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		143	50-150	M-03	100	50-150
13C2_8:2FTS		103	50-150	M-03	92	50-150
13C2_PFDoA		79	50-150		79	50-150
13C2_PFTeDA		67	50-150		79	50-150
13C3_PFBS		93	50-150		105	50-150
13C3_PFHxS		111	50-150	M-03	113	50-150
13C4_PFBA	N	40	50-150		88	50-150
13C4_PFHpA		111	50-150		113	50-150
13C5_PFHxA		100	50-150		108	50-150
13C5_PFPeA		71	50-150		105	50-150
13C6_PFDA		88	50-150		96	50-150
13C7_PFUdA		83	50-150		80	50-150
13C8_PFOA		108	50-150		106	50-150
13C8_PFOS		104	50-150	M-03	96	50-150
13C9_PFNA		108	50-150		103	50-150
d5-EtFOSAA		76	50-150		80	50-150
d3-MeFOSAA		90	50-150		88	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc. | Laboratory ID: XK21004-031
Description: LHAAP-16WW13-111622 | Matrix: Aqueous
Date Sampled: 11/16/2022 1700 | Project Name: LHAAP
Date Received: 11/21/2022 | Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2241	ALM	11/22/2022 1206	60791
2	SOP SPE	PFAS by ID SOP QSM B-15	5	11/29/2022 1409	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	18	U	36	18	9.1	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	18	U	36	18	9.1	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	18	U	36	18	9.1	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	18	U	36	18	9.1	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	9.0	UM-03	18	9.0	4.6	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	620	M-03 DM	18	9.0	4.6	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	9.0	U	18	9.0	4.6	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.0	UM-03	18	9.0	4.6	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		143	50-150	M-03	100	50-150
13C2_8:2FTS		103	50-150	M-03	92	50-150
13C2_PFDoA		79	50-150		79	50-150
13C2_PFTeDA		67	50-150		79	50-150
13C3_PFBS		93	50-150		105	50-150
13C3_PFHxS		111	50-150	M-03	113	50-150
13C4_PFBA	N	40	50-150		88	50-150
13C4_PFHpA		111	50-150		113	50-150
13C5_PFHxA		100	50-150		108	50-150
13C5_PFPeA		71	50-150		105	50-150
13C6_PFDA		88	50-150		96	50-150
13C7_PFUdA		83	50-150		80	50-150
13C8_PFOA		108	50-150		106	50-150
13C8_PFOS		104	50-150	M-03	96	50-150
13C9_PFNA		108	50-150		103	50-150
d5-EtFOSAA		76	50-150		80	50-150
d3-MeFOSAA		90	50-150		88	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-032
Description: LHAAP-16WW16-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1455
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2252	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UQ U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	UM-03 U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.4	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	UM-03 U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.0	JM-03 JM	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.1	JM-03 JM	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.6	J	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	153	50-150
13C2_8:2FTS		125	50-150
13C2_PFDoA		120	50-150
13C2_PFTeDA		109	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		116	50-150
13C4_PFBA		66	50-150
13C4_PFHpA		110	50-150
13C5_PFHxA		116	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		105	50-150
13C7_PFUdA		113	50-150
13C8_PFOA		121	50-150
13C8_PFOS		118	50-150
13C9_PFNA		120	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		114	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-033
Description: LHAAP-MW2-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1030
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2303	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.3	U	6.6	3.3	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.3	UQ	6.6	3.3	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.3	U	6.6	3.3	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.3	U	6.6	3.3	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	11		3.3	1.7	0.83	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.3	M-03	3.3	1.7	0.83	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.6		3.3	1.7	0.83	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.5		3.3	1.7	0.83	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	5.4		3.3	1.7	0.83	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	24		3.3	1.7	0.83	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.3	1.7	0.83	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	29	M-03	3.3	1.7	0.83	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	166	50-150
13C2_8:2FTS		144	50-150
13C2_PFDoA		115	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		116	50-150
13C4_PFBA		75	50-150
13C4_PFHpA		119	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		114	50-150
13C8_PFOA		119	50-150
13C8_PFOS		113	50-150
13C9_PFNA		113	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		120	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-034
Description: LHAAP-016-DEB-2-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1240
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2314	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UM-03 U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	4.2		3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	UM-03 U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	UM-03 U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.5	JM-03 JM	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	J	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	UM-03 U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		121	50-150
13C2_8:2FTS		116	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		62	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		106	50-150
13C4_PFBA		65	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		109	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		89	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		113	50-150
13C8_PFOS		111	50-150
13C9_PFNA		113	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21004-035
Description: LHAAP-012-DEB-1-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 1155
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2325	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	UM-03	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.3	JQM-03	3.8	1.9	0.96	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	11	M-03	3.8	1.9	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		150	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		70	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		118	50-150
13C4_PFBA	N	46	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		111	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		106	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		112	50-150
13C8_PFOS		110	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Client ID: 4367 - Pace Analytical Services
SDG: 222112307
PM: RWe

Chain of Custody

Workorder: XK21004 Workorder Name: LHAAP Owner Received Date: 11/21/2022 Results Requested By:

Report To:	Subcontract To:
Kathy E. Smith Pace Analytical 106 Vantage Point Drive Columbia SC, 29223 803-227-2704 Kathy.Smith@pacelabs.com	Project # Pace Gulf Coast 7979 Innovation Park Drive, Baton Rouge, LA 70820

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: 906 - TOC- DOD
1							
2							
3	LHAAP-HWSA-SO-01-111222	grab	11/12/2022 @ 0845	XK21004-004	Solid		X
4	LHAAP-CSA-SO-02-111422	grab	11/14/2022 @ 1050	XK21004-006	Solid		X
5							
6							
7							
8							
9							
10							

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1	FedEx Priority Overnight	11/22/22 1900			
2	FedEx	11/23/22 909	Kenneth Parker	11/23/22 909	E38 0.9
3					

Cooler Temperature on Receipt _____ °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM FMT-ALL-C-002rev.00 24March2009

1663 3468 3749

I - GENERAL CHEMISTRY ANALYSIS DATA SHEET

Report No:	222112307	Client Sample ID:	LHAAP-HWSA-SO-01-111222
Collect Date:	11/12/22 0845	LAB Sample ID:	22211230701
Matrix:	Solid	Instrument ID:	TOC7
% Solids:	NA	Analyst:	JGD
Sample Amt:	NA	Lab File ID:	NA
Prep Vol.:	NA	Dilution Factor:	1
Prep Date:	NA	Analysis Date:	12/01/22 1155
Prep Batch:	NA	Analytical Batch:	755036
Prep Method:	NA	Analytical Method:	EPA 9060A

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOQ*
Total Organic Carbon	1940	mg/kg		153	250

FORM I - GENCHEM

I - GENERAL CHEMISTRY ANALYSIS DATA SHEET

Report No:	222112307	Client Sample ID:	LHAAP-CSA-SO-02-111422
Collect Date:	11/14/22 1050	LAB Sample ID:	22211230702
Matrix:	Solid	Instrument ID:	TOC7
% Solids:	NA	Analyst:	JGD
Sample Amt:	NA	Lab File ID:	NA
Prep Vol.:	NA	Dilution Factor:	1
Prep Date:	NA	Analysis Date:	12/01/22 1202
Prep Batch:	NA	Analytical Batch:	755036
Prep Method:	NA	Analytical Method:	EPA 9060A

ANALYTE	*RESULT*	*UNITS*	*Q*	*DL*	*LOQ*
Total Organic Carbon	349	mg/kg		153	250

FORM I - GENCHEM

ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS), TOC and Soil pH Analyses

SDGs # XK21007, and 222112401

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

And

Pace Analytical Gulf Coast
Baton Rouge, Louisiana

Report # 48030R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # XK21007, and 222112401 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-ONFS-SO-01-111522	XK21007-001	Soil	11/15/2022		X		
LHAAP-ONFS-SO-02-111522	XK21007-002	Soil	11/15/2022		X		
LHAAP-ONFS-SO-03-111522	XK21007-003	Soil	11/15/2022		X		
LHAAP-ONFS-SO-04-111522	XK21007-004	Soil	11/15/2022		X		
LHAAP-ONFS-GW-02-111622	XK21007-005	Water	11/16/2022		X		
LHAAP-ONFS-GW-03-111622	XK21007-006	Water	11/16/2022		X		
LHAAP-ONFS-SO-01-111522	22211240101	Soil	11/15/2022		X	X	X

Notes:

1. Stage 3/4 validation was performed on sample location LHAAP-ONFS-GW-03-111622.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was not performed on sample locations.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard must be within 70-130% of their true value.

The initial calibration, and initial calibration verification standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the initial and continuing calibrations were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	EIS	Associated Compound	%R	RE %R
LHAAP-ONFS-SO-01-111522	13C2_PFTeDA	Perfluoro-n-tetradecanoic acid (PFTeDA)	**> 150%**	Not Analyzed
	13C3_PFHxS	Perfluorohexanesulfonic acid (PFHxS)	**> 150%**	
	13C8_PFOA	Perfluoro-n-octanoic acid (PFOA)	**> 150%**	
LHAAP-ONFS-SO-03-111522	13C8_PFOA	Perfluoro-n-octanoic acid (PFOA)	**> 150%**	Not Analyzed
LHAAP-ONFS-SO-04-111522	13C8_PFOA	Perfluoro-n-octanoic acid (PFOA)	**> 150%**	Not Analyzed
	d5-EtFOSAA	EtFOSAA	**> 150%**	
LHAAP-ONFS-GW-02-111622	13C2_6:2FTS	6:2FTS	**> 150%**	Not Analyzed
	13C2_8:2FTS	8:2FTS	**> 150%**	
	13C2_PFDoA	Perfluoro-n-dodecanoic acid (PFDoA)	**> 150%**	
		Perfluoro-n-tridecanoic acid (PFTrDA)		

Sample Locations	EIS	Associated Compound	%R	RE %R
	13C7_PFUdA	Perfluoro-n-undecanoic acid (PFUdA)	**> 150%**	
	d5-EtFOSAA	EtFOSAA	**> 150%**	
	d3-MeFOSAA	MeFOSAA	**< 50% but > 20%**	

Where a re-extracted analysis was performed, results are reported from the analysis in bold above.

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed on sample locations associated with this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three time the LOQ for soil matrices.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

The case narrative notes that for samples LHAAP-ONFS-GW-02-111622, and LHAAP-ONFS-GW-03-111622 required centrifugation prior to extraction, due to excessive solids present in the sample. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; sample was spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of MeOH each. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using MeOH by transfer pipet. Hence, the target compounds were not qualified for the sample preparation modification.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to "M" and preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 9045D and 9060A. Data were reviewed in accordance with Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers

  U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

  J The reported value was obtained from a reading less than the limit of detection (LOQ), but greater than or equal to the detection limit (DL).

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

- Validation Qualifiers

  J The reported result was an estimated value with an unknown bias.

  J+ The result was an estimated quantity, but the result may be biased high.

  J- The result was an estimated quantity, but the result may be biased low.

  UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Total Organic Carbon (TOC) by SW846 9060A	Soil	28 days from collection to analysis	Cool to <6 °C.
pH by SW846 9045D	Soil	Within 24 hours of receipt at laboratory	Cool to <6 °C.

The analyses that exceeded the holding time are presented in the following table.

Sample Location	Holding Time	Criteria
LHAAP-ONFS-SO-01-111522	17 days from collection	28 days from collection to analysis

Sample results associated with sample locations analyzed by analytical method SW-846 9045D were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification
	Detected Analytes
Analysis completed past holding time	J

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

TOC was not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all initial calibration verification standard recoveries were within control limits. The calibration verification limit for pH is within ± 0.05 su of the true value.

pH: The initial and continuing calibration criteria were within the acceptance criteria of ± 0.05 SU of the true value.

TOC: The calibration criteria were within the acceptance limit.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater.

A MS analysis was not performed for TOC analysis.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the LOQ. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of one time the LOQ is applied for water matrices and two times the LOQ for soil matrices. The laboratory duplicate control limits for soil pH is ≤ 0.1 su.

A laboratory duplicate analysis was not performed for TOC and pH.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of three times the LOQ is applied for soil matrices.

Field duplicate analysis was not performed on a sample location within this SDG.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW846 9045D/9060A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Lab Duplicate (RPD)	X				X
Field Duplicate (RPD)	X				X
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Initial calibration correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculations acceptable		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:
%R - percent recovery
RPD - relative percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Pruthvi Kumar C, Arcadis

SIGNATURE:

DATE: December 26, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: December 27, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XK21007
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/23/2022
Page: 1
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3
Instrument : LCMSMS02.i
PFBA 11/17/2022 Calibration

Pg 342-352 of SDG XK21007

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
100	54454	1173354	2000	0.046409	0.92818	0.965990	96.09	100	96.09	96.1	MATCH
200	112252	1162706	2000	0.096544	0.96544	0.965990	199.89	200	99.94	99.9	MATCH
500	286624	1237627	2000	0.231592	0.92637	0.965990	479.49	500	95.90	95.9	MATCH
1000	571805	1203304	2000	0.475196	0.95039	0.965990	983.85	1000	98.39	98.4	MATCH
2000	1133906	1169743	2000	0.969363	0.96936	0.965990	2006.98	2000	100.35	100.3	MATCH
5000	2766499	1165478	2000	2.373703	0.94948	0.965990	4914.55	5000	98.29	98.3	MATCH
10000	5708903	1128402	2000	5.059281	1.01186	0.965990	10474.81	10000	104.75	104.7	MATCH
15000	8551038	1146674	2000	7.457253	0.99430	0.965990	15439.61	15000	102.93	102.9	MATCH
20000	11294539	1131108	2000	9.985376	0.99854	0.965990	20673.87	20000	103.37	103.4	MATCH
				Avg RF	0.9659901	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XK21007
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/23/2022
Page: 2
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS02.i
ICV 1000_SVLC-2298 17-Nov-2022 14:03:18

File ID: 111722017.d
Page 560 of SDG XK21007

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFOA	828.60	1000	82.86	82.9	MATCH
PFDA	994.81	1000	99.48	99.5	MATCH
PFDoA	826.36	1000	82.64	92.6	MATCH

Instrument: LCMSMS02.i
CCV 1000C_SVLC-2263 28-Nov-2022 21:57:15

File ID: 112822047.d
Page 861 of SDG XK21007

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFOA	998.07	1000	99.81	99.8	MATCH
PFDA	1028.93	1000	102.89	102.9	MATCH
PFDoA	1007.50	1000	100.75	100.7	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XK21007 Date: 12/23/2022
Lab: Pace (Shealy) Page: 3
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS02.i
LCS XQ60791-002 Pg 1069-1073 of SDG XK21007
This LCS is applicable for the sample LHAAP-ONFS-GW-03-111622 (XK21007-006) Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFOA	448883	1147600	2000	0.391149	0.981342	797.17	250	15.94	16	99.6465	100	MATCH
PFDA	439135	1076657	2000	0.407869	0.923186	883.61	250	17.67	16	110.4515	110	MATCH
PFOS	123808	281830	2000	0.4393	1.160609	757.02	250	15.14	15	100.9356	102	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated amount ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS Sample Concentration

SDG #: XK21007
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/23/2022
Page: 4
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-ONFS-GW-03-111622 Lab ID: XK21007-006 Page 93 of SDG XK21007
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFOA	919458	1150086	2000	0.799469	0.981342	1629.34	5	250.33	32.54	33	Match
PFNA	658755	1243524	2000	0.529749	0.895982	1182.50	5	250.33	23.62	24	Match
PFOS	35777	281336	2000	0.127168	1.160609	219.14	5	250.33	4.38	4.4	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #: XK21007 Date: 12/23/2022
Lab: Pace (Shealy) Page: 5
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-ONFS-GW-03-111622 Lab ID: XK21007-006

EIS 13C4_PFBA
REPORTED EIS %R 88

$$\%R = \frac{100 * \text{EIS Area}}{\text{CCV 200 EIS Area}}$$

EIS Area 912139 Page 94 of SDG XK21007
CCV 200 EIS Area 1035538 Page 705 of SDG XK21007
%R 88.1 MATCH

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive - West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 139207

Arcadis

Client: Arcadis

Report to Contact: Dana Schmidt

Telephone No. / E-mail: Dana.Schmidt@Arcadis.com

Quote No.:

Address:

Sampler's Signature: Daniel Lucas

Analysis (Attach list if more space is needed)

Page 1 of 1

City: State: Zip Code:

Printed Name: Daniel Lucas

Project Name: LHAAP PEAs

XK21007

Project No.: 30061827.40015

P.O. No.:

Sample ID / Description (Containers for each sample may be combined on one line)

Sample ID / Description	Collection Date	Collection Time (Military)	# of Containers	Matrix: Air	Matrix: Solid	Matrix: Wastewater	Matrix: Groundwater	Matrix: Surface Water	Matrix: Soil	Matrix: Oil	Matrix: Other	Matrix: Tissue	Matrix: Wipe	Analysis: VOCs	Analysis: TPH, GRO, DRO	Remarks / Cooler ID
LHAAP-ONFS-SS-01-111522	11/15/22	1130	G		X									X	X	
LHAAP-ONFS-SS-02-111522		2340	G		X									X		
LHAAP-ONFS-SS-03-111522		1510	G		X									X		
LHAAP-ONFS-SS-04-111522	↓	1620	G		X									X		
LHAAP-ONFS-GW-02-111622	11/16/22	0945	G			X								X		
LHAAP-ONFS-GW-03-111622	↓	1130	G			X								X		

Turn Around Time Required (Prior lab approval required for expedited TAT)
☑ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by:	11/16/22	1700	1. Received by:		
2. Relinquished by:			2. Received by:		
3. Relinquished by:			3. Received by:		
4. Relinquished by: FedEx	11/21/22	0950	4. Laboratory received by: Courtney Rea	11/21/22	0950

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) Yes No Ice Pack | Receipt Temp 0.4 °C | Temp Blank ☑ Y ☐ N

DISTRIBUTION: WHITE & YELLOW (Return to laboratory with Sample(s)) PINK-Field/Client Copy

Document Number: MSDSANE.rtf

PACE ANALYTICAL SERVICES, LLC

DOD PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001 NELAC No: E87653 NC DENR No: 329 NC Field Parameters No: 5639

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: XK21007

Project Name: LHAAP

Project Number: 30001997.40013

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XK21007-001	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	XK21007-002	1	13C3_PFHxS	M-03
PFAS by ID SOP	XK21007-003	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK21007-005	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XK21007-005	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	XK21007-005	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	XK21007-005	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	XK21007-005	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK21007-006	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XK21007-006	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	XK21007-006	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XK21007-006	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ60943-001	1	d3-MeFOSAA	M-03
PFAS by ID SOP	XQ60791-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ60791-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ60791-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Inorganic non-metals

Client: Arcadis U.S., Inc.		Laboratory ID: XK21007-001	
Description: LHAAP-ONFS-SO-01-111522		Matrix: Solid	
Date Sampled: 11/15/2022 1100	Project Name: LHAAP	% Solids: 83.1	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/02/2022 1353	BMG2		61557

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 17.8 ° C		9045D	5.9	J				su	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21007-001	
Description: LHAAP-ONFS-SO-01-111522		Matrix: Solid	
Date Sampled: 11/15/2022 1100	Project Name: LHAAP	% Solids: 83.1	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2113	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	~~UQ~~ U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	~~UQ~~ U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	~~UQ~~ U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00082	~~JM-03~~ JM	0.0012	0.00060	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		145	50-150
13C2_8:2FTS		150	50-150
13C2_PFDoA		139	50-150
13C2_PFTeDA	N	155	50-150
13C3_PFBS		133	50-150
13C3_PFHxS	N	152	50-150
13C4_PFBA		139	50-150
13C4_PFHpA		146	50-150
13C5_PFHxA		127	50-150
13C5_PFPeA		135	50-150
13C6_PFDA		141	50-150
13C7_PFUdA		130	50-150
13C8_PFOA	N	156	50-150
13C8_PFOS		137	50-150
13C9_PFNA		148	50-150
d5-EtFOSAA		144	50-150
d3-MeFOSAA		139	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21007-002	
Description: LHAAP-ONFS-SO-02-111522		Matrix: Solid	
Date Sampled: 11/15/2022 0840	Project Name: LHAAP	% Solids: 83.1	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2124	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00052	J	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.0013		0.0010	0.00050	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		143	50-150
13C2_8:2FTS		141	50-150
13C2_PFDoA		115	50-150
13C2_PFTeDA		137	50-150
13C3_PFBS		113	50-150
13C3_PFHxS	M-03	112	50-150
13C4_PFBA		115	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		124	50-150
13C7_PFUdA		123	50-150
13C8_PFOA		147	50-150
13C8_PFOS		122	50-150
13C9_PFNA		114	50-150
d5-EtFOSAA		135	50-150
d3-MeFOSAA		113	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21007-003	
Description: LHAAP-ONFS-SO-03-111522		Matrix: Solid	
Date Sampled: 11/15/2022 1510	Project Name: LHAAP	% Solids: 80.5	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2134	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	~~UQ~~ U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U~~M-03~~	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		133	50-150
13C2_8:2FTS		145	50-150
13C2_PFDoA		126	50-150
13C2_PFTeDA		139	50-150
13C3_PFBS		120	50-150
13C3_PFHxS		142	50-150
13C4_PFBA		122	50-150
13C4_PFHpA		123	50-150
13C5_PFHxA		121	50-150
13C5_PFPeA		121	50-150
13C6_PFDA		130	50-150
13C7_PFUdA		121	50-150
13C8_PFOA	N	168	50-150
13C8_PFOS		137	50-150
13C9_PFNA		127	50-150
d5-EtFOSAA		115	50-150
d3-MeFOSAA		124	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21007-004	
Description: LHAAP-ONFS-SO-04-111522		Matrix: Solid	
Date Sampled: 11/15/2022 1630	Project Name: LHAAP	% Solids: 89.5	11/25/2022 1752
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2145	BWS	11/23/2022 1931	60943

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	~~UQ~~ U	0.0019	0.00095	0.00048	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00048	~~UQ~~ U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		124	50-150
13C2_8:2FTS		148	50-150
13C2_PFDoA		116	50-150
13C2_PFTeDA		131	50-150
13C3_PFBS		114	50-150
13C3_PFHxS		127	50-150
13C4_PFBA		112	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		116	50-150
13C6_PFDA		115	50-150
13C7_PFUdA		121	50-150
13C8_PFOA	N	151	50-150
13C8_PFOS		117	50-150
13C9_PFNA		124	50-150
d5-EtFOSAA	N	162	50-150
d3-MeFOSAA		133	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK21007-005
Description: LHAAP-ONFS-GW-02-111622
Matrix: Aqueous
Date Sampled: 11/16/2022 0945
Project Name: LHAAP
Date Received: 11/21/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2336	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.3	UQ U	8.6	4.3	2.1	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	36	Q J-	8.6	4.3	2.1	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.3	UQ U	8.6	4.3	2.1	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.3	UQ UJ	8.6	4.3	2.1	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	6.5		4.3	2.2	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.7	~~M-03~~ M	4.3	2.2	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	79		4.3	2.2	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.2	~~UQ~~ U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	30		4.3	2.2	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	42	~~M-03~~ M	4.3	2.2	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	18		4.3	2.2	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	160		4.3	2.2	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	50	~~M-03~~ M	4.3	2.2	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.2	U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.2	~~UQ~~ U	4.3	2.2	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	~~UQM-03~~ U	4.3	2.2	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.2	~~UM-03~~ U	4.3	2.2	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	185	50-150
13C2_8:2FTS	N	353	50-150
13C2_PFDoA	N	162	50-150
13C2_PFTeDA		106	50-150
13C3_PFBS		111	50-150
13C3_PFHxS		119	50-150
13C4_PFBA		112	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		127	50-150
13C5_PFPeA		107	50-150
13C6_PFDA		143	50-150
13C7_PFUdA	N	151	50-150
13C8_PFOA		130	50-150
13C8_PFOS		129	50-150
13C9_PFNA		132	50-150
d5-EtFOSAA	N	157	50-150
d3-MeFOSAA	N	42	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK21007-006	
Description: LHAAP-ONFS-GW-03-111622		Matrix: Aqueous	
Date Sampled: 11/16/2022 1100	Project Name: LHAAP		
Date Received: 11/21/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/28/2022 2347	ALM	11/22/2022 1206	60791

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	17		8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.2	J	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.2	~~JM-03~~ JM	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	56		4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	26		4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	28	~~M-03~~ M	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	24		4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	33	~~M-03~~ M	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	36		4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.4	~~M-03~~ M	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		135	50-150
13C2_8:2FTS		146	50-150
13C2_PFDoA		129	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		109	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		113	50-150
13C5_PFHxA		114	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		114	50-150
13C8_PFOA		121	50-150
13C8_PFOS		123	50-150
13C9_PFNA		118	50-150
d5-EtFOSAA		113	50-150
d3-MeFOSAA		150	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Chain of Custody

Pace Analytical

Workorder: XK21007 Workorder Name: LHAAP Owner Received Date: 11/21/2022 Results Requested By: 12/7/2022

Report To	Subcontract To	Requested Analysis
Kathy E. Smith Pace Analytical 106 Vantage Point Drive Columbia SC, 29223 803-227-2704 Kathy.Smith@pacelabs.com	Project # Pace Gulf Coast 7979 Innovation Park Drive Baton Rouge, LA 70820	

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	9060 - TOC - DOD	LAB USE ONLY
1								
2								
3	LHAAP-ONFS-SO-01-111522	grab	11/15/2022 @ 1100	XK21007-0C1	Solid		X	
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	FedEx	11/22/22 1410			5788 1463 3465 3738
2		11-23-22 0919		11-23-22 0919	
3					

Cooler Temperature on Receipt ____ °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM FMT-ALL-C-002rev.00 Page 1 of 1

Client ID: 4367 - Pace Analytical Services
SDG: 222112401
PM: RWe

Report#: 222112401
Project ID: XK21007 LHAAP **Report Date:** 12/08/2022

Sample Results

LHAAP-ONFS-SO-01-111522				
	Collect Date	11/15/2022 11:00	**Lab ID**	22211240101
	Receive Date	11/23/2022 09:19	**Matrix**	Solid

EPA 9060A

*Results are reported on a dry weight basis.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	1	12/01/22 13:20	755036	JGD	NA

CAS#	Parameter	Result	DL	LOQ	Units
C-012	Total Organic Carbon	2400	153	250	mg/kg

ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS) Analyses

SDG # XL03005

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

Report # 48118R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XL03005 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-ONFS-GW-01-112822	XL03005-001	Water	11/28/2022		X		
LHAAP-ONFS-GW-04-112822	XL03005-002	Water	11/28/2022		X		
LHAAP-HWSA-SO-01-112922	XL03005-003	Soil	11/29/2022		X		
LHAAP-HWSA-GW-01-112922	XL03005-004	Water	11/29/2022		X		

Notes:

1. Stage 3/4 validation was performed on sample location LHAAP-ONFS-GW-04-112822.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location LHAAP-HWSA-GW-01-112922.

The project team instructed the laboratory to cancel analysis for the sample LHAAP-HWSA-SO-01-112922 (XL03005-003). The sample was collected and analyzed and associated with the SDG# XK21004; hence, the data review was performed and documented in the DVR# 48015R.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

R The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Rejection of the data was decided by the project team and USACE chemist.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard must be within 70-130% of their true value.

The initial calibration, calibration standards, and ICV standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the continuing calibration standards were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	EIS	Associated Compound	%R	
LHAAP-ONFS-GW-01-112822	13C2_PFDoA	Perfluoro-n-dodecanoic acid (PFDoA)	< 20%	
		Perfluoro-n-tridecanoic acid (PFTrDA)		
	13C2_PFTeDA	Perfluoro-n-tetradecanoic acid (PFTeDA)		
	13C7_PFUdA	Perfluoro-n-undecanoic acid (PFUdA)	< 50% but > 20%	
	13C8_PFOS	Perfluorooctanesulfonic acid (PFOS)		
	d5-EtFOSAA	EtFOSAA		
	d3-MeFOSAA	MeFOSAA		
LHAAP-HWSA-GW-01-112922	13C2_6:2FTS	6:2 FTS	> 150%	
	13C2_PFDoA	Perfluoro-n-dodecanoic acid (PFDoA)	< 50% but > 20%	
		Perfluoro-n-tridecanoic acid (PFTrDA)		
	13C2_PFTeDA	Perfluoro-n-tetradecanoic acid (PFTeDA)	< 20%	

The project team and USACE chemist decided that results for compounds associated with EIS exhibiting recoveries less than 20 percent will be rejected.

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location LHAAP-HWSA-GW-01-112922 exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	Compound	MS Recovery	MSD Recovery
LHAAP-HWSA-GW-01-112922	Perfluoro-n-tridecanoic acid (PFTrDA)	<LL but >10%	<LL but >10%

Note:
LL Lower control limit

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J+
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	UX
	Detect	J-
SR>4X: Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

Sample location associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Location	Compounds
LHAAP-HWSA-GW-01-112922	6:2 FTS
	PFTeDA
	PFUdA
	PFOS

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 30%	Non-detect	UJ
	Detect	J

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three time the LOQ for soil matrices.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

The case narrative notes that samples LHAAP-ONFS-GW-01-112822, LHAAP-ONFS-GW-04-112822, and LHAAP-HWSA-GW-01-112922 required centrifugation prior to extraction, due to excessive solids present in the sample. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; sample was spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of methanol each. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to

10mL using methanol by transfer pipet. Hence, the target compounds were not qualified for the sample preparation modification.

The case narrative notes that for sample LHAAP-HWSA-GW-01-112922, the sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Therefore, all PFAS compounds are qualified as estimated (UJ-,J-) for this sample location.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to “M” and preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R		X	X		
MS/MSD Precision (RPD)		X	X		
Field Duplicate (RPD)	X				X
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Pruthvi Kumar C, Arcadis

SIGNATURE:

DATE: January 2, 2023

PEER REVIEW: Dennis Capria, Arcadis

DATE: January 19, 2023

Stage 3 / 4
PFAS Calibration Standards

SDG #: XL03005 Date: 01/02/2023
Lab: Pace (Shealy) Page: 1
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3
Instrument : LCMSMS01.i
PFPeA 11/8/2022 Calibration Pg 89-99 of SDG XL03005

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
100	78715	1456054	2000	0.05406	1.08121	1.084065	99.74	100	99.74	99.7	MATCH
200	154738	1458265	2000	0.106111	1.06111	1.084065	195.77	200	97.88	97.9	MATCH
500	410943	1518234	2000	0.270672	1.08269	1.084065	499.36	500	99.87	99.9	MATCH
1000	740470	1306360	2000	0.566819	1.13364	1.084065	1045.73	1000	104.57	104.6	MATCH
2000	1495356	1410480	2000	1.060175	1.06018	1.084065	1955.93	2000	97.80	97.8	MATCH
5000	4021274	1535280	2000	2.619245	1.04770	1.084065	4832.27	5000	96.65	96.6	MATCH
10000	7543591	1358984	2000	5.550905	1.11018	1.084065	10240.91	10000	102.41	102.4	MATCH
15000	11179726	1369418	2000	8.163852	1.08851	1.084065	15061.55	15000	100.41	100.4	MATCH
20000	14654788	1342789	2000	10.91369	1.09137	1.084065	20134.76	20000	100.67	100.7	MATCH
				Avg RF	1.0840647	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XL03005
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 01/02/2023
Page: 2
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS01.i
ICV_1000_SVLC-2193 08-Nov-2022 18:44:56

File ID: 110822B018.d
Page 299 of SDG XL03005

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFOA	776.65	1000	77.67	77.7	MATCH
PFDA	888.82	1000	88.88	88.9	MATCH
PFDoA	800.32	1000	80.03	80	MATCH

Instrument: LCMSMS01.i
CCV 200_SVLC-2261 15-Dec-2022 12:51:08

File ID: 121522005.d
Page 851 of SDG XL03005

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFOA	200.71	200	100.36	100.4	MATCH
PFDA	176.37	200	88.19	88.2	MATCH
PFDoA	198.95	200	99.48	99.5	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XL03005 Date: 01/02/2023
Lab: Pace (Shealy) Page: 3
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS01.i
LCS XQ62514-002 Pg 1350-1354 of SDG XL03005
This LCS is applicable for the sample LHAAP-ONFS-GW-04-112822 (XL03005-002) Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHpA	732420	1765112	2000	0.414943	1.058208	784.24	250	15.68	16	98.03	98	MATCH
PFHxA	810056	1875753	2000	0.431856	0.945864	913.15	250	18.26	16	114.14	114	MATCH
PFOA	735844	1681797	2000	0.437534	0.973574	898.82	250	17.98	16	112.35	112	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated amount ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XL03005 Date: 01/02/2023
Lab: Pace (Shealy) Page: 4
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

MS/MSD Sample ID LHAAP-HWSA-GW-01-112922 Page 1401 and 1448 of SDG XL03005
ANALYTE PFBS
REPORTED MS %R 107
REPORTED MSD %R 117
REPORTED RPD 28

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}} \qquad RPD = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration	0			
MS Concentration	16	MS %R	106.67	MATCH
MSD Concentration	21	MSD %R	116.67	MATCH
MS TV	15	RPD	27.03	MATCH
MSD TV	18			

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XL03005
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 01/02/2023
Page: 5
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-ONFS-GW-04-112822 Lab ID: XL03005-002 Page 64 of SDG XL03005
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHpA	282599	1726888	2000	0.163646	1.058208	309.29	5	287.21	5.38	5.4	Match
PFHxA	175728	2187447	2000	0.080335	0.945864	169.87	5	287.21	2.96	3.0 J	Match
PFOA	808024	1726067	2000	0.46813	0.973574	961.67	5	287.21	16.74	17	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #: XL03005 Date: 01/02/2023
Lab: Pace (Shealy) Page: 6
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-ONFS-GW-04-112822 Lab ID: XL03005-002

EIS 13C4_PFBA
REPORTED EIS %R 119

$$\%R = \frac{100 * \text{EIS Area}}{\text{CCV 200 EIS Area}}$$

EIS Area 2535071 Page 94 of SDG XL03005
CCV 200 EIS Area 2124179 Page 853 of SDG XL03005
%R 119.3 MATCH

CHAIN OF CUSTODY
SAMPLE ANALYSIS DATA SHEETS

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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Pace Analytical

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www.pacelabs.com

Number 139203

Arcadis / USACE

Client: Jensen DR	Report to Contact: Dana Schmidt	Telephone No. / E-mail: Dana.Schmidt@Arcadis	Quote No.
Address: Kaufman TX 75142	Sampler's Signature: x	Analysis (Attach list if more space is needed)	Page ___ of ___
City: LHAAP PFAS	State:	Zip Code:	
Project Name: 30021717	Printed Name: Daniel Lineau		
Project No.	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab=G Composite=C	Matrix: Aqueous	Solid	Other	No. of Containers by Preservative Type: Unpres	H2SO4	HNO3	HCl	NaOH	NaOH/ZN Ac	Total # Filtered	TCLP VOC	TCLP	Ignitability, pH	Reactivity	PFAS	TOC, pH, grain size	
LHAAP-IDW-SO-113022	11/30/22	1430	C		X		X							X	X	X	X	X		
LHAAP-IDW-W-113022	11/30/22	1500	C	X										X	X	X	X	X		
LHAAP-ONFS-GW-01-112822	11-29-22	15:40	G	X														X		
LHAAP-ONFS-GW-04-112822	11-28-22	16:05		X														X		
LHAAP-HWSA-SO-01-112922	11-29-22	08:20			X														X	
LHAAP-HWSA-GW-01-112922	11-29-22	09:30		X														X		MS/MSD

Turn Around Time Required (Prior lab approval required for expedited TAT.) ☐ Standard ☐ Rush (Specify)

Sample Disposal ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	11/30/22	1510	1. Received by		
2. Relinquished by	11-30-22	1510	2. Received by		
3. Relinquished by Fedex	12/1/22	1550	3. Received by Hayle N Roberts	12/1/22	1550
4. Relinquished by Fed ex	12/2/22	1600	4. Laboratory received by Hayle N Roberts	12/2/22	1600

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) (Yes) No Ice Pack
Receipt Temp 2.1 °C
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XL03004
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PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001 NELAC No: E87653 NC DENR No: 329 NC Field Parameters No: 5639

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: XL03005

Project Name: Longhorn AAP PFAS

Project Number: 30001997.40013

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XL03005-001	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XL03005-001	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	XL03005-001	1	Perfluoro-n-pentanoic acid (PFPeA)	M-03
PFAS by ID SOP	XL03005-001	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ62514-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ62514-002	1	d5-EtFOSAA	M-03
PFAS by ID SOP	XQ61776-002	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XQ61776-002	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	XQ61776-002	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XQ61776-002	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	XQ61776-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ61776-002	1	13C8_PFOS	M-03
PFAS by ID SOP	XQ62610-002	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XL03005-004MD	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XL03005-004MD	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	XQ62610-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XL03005-004MS	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ62610-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XL03005-004MS	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XL03005-004MD	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ62610-002	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	XL03005-004MS	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	XL03005-004MS	1	Perfluoro-n-dodecanoic acid (PFDoA)	M-03
PFAS by ID SOP	XL03005-004MS	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	XL03005-004MD	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	XQ62610-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XL03005-004MD	1	Perfluoro-n-tetradecanoic acid	M-03
PFAS by ID SOP	XL03005-004MS	1	Perfluoro-n-undecanoic acid (PFUdA)	M-03
PFAS by ID SOP	XQ62610-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XL03005-004MS	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ62610-002	1	13C2_8:2FTS	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XL03005-001
Description: LHAAP-ONFS-GW-01-112822
Matrix: Aqueous
Date Sampled: 11/28/2022 1540
Project Name: Longhorn AAP PFAS
Date Received: 12/02/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/14/2022 1624	BWS	12/13/2022 1134	625114

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.7	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	UQ	6.7	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	UQ	6.7	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	UM-03	3.4	1.7	0.84	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	UQ	3.4	1.7	0.84	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.84	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	UM-03	3.4	1.7	0.84	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	5.6		3.4	1.7	0.84	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	25		3.4	1.7	0.84	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	UM-03	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	UQ	3.4	1.7	0.84	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	UQ	3.4	1.7	0.84	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	UQ	3.4	1.7	0.84	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	11	QM-03	3.4	1.7	0.84	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		91	50-150
13C2_8:2FTS		64	50-150
13C2_PFDoA	N	5.1	50-150
13C2_PFTeDA	N	0.20	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		65	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		55	50-150
13C7_PFUdA	N	20	50-150
13C8_PFOA		82	50-150
13C8_PFOS	N	29	50-150
13C9_PFNA		79	50-150
d5-EtFOSAA	N	23	50-150
d3-MeFOSAA	N	41	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL03005-002	
Description: LHAAP-ONFS-GW-04-112822		Matrix: Aqueous	
Date Sampled: 11/28/2022 1605	Project Name: Longhorn AAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 1354	ARC2	12/13/2022 1134	62514

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.3	J	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.4		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	3.0	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		117	50-150
13C2_8:2FTS		121	50-150
13C2_PFDoA		112	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		119	50-150
13C3_PFHxS		114	50-150
13C4_PFBA		119	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		133	50-150
13C5_PFPeA		123	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		104	50-150
13C8_PFOA		120	50-150
13C8_PFOS		94	50-150
13C9_PFNA		117	50-150
d5-EtFOSAA		104	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Inorganic non-metals

Client: Arcadis U.S., Inc.
Laboratory ID: XL03005-003
Description: LHAAP-HWSA-SO-01-112922
Matrix: Solid
Date Sampled: 11/29/2022 0820
Project Name: Longhorn AAP PFAS
% Solids: 81.1 12/06/2022 0547
Date Received: 12/02/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/08/2022 1646	BMG2		62174

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 19.2 ° C		9045D	5.3					su	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XL03005-003
Description: LHAAP-HWSA-SO-01-112922
Matrix: Solid
Date Sampled: 11/29/2022 0820
Project Name: Longhorn AAP PFAS
% Solids: 81.1 12/06/2022 0547
Date Received: 12/02/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/06/2022 1735	BWS	12/05/2022 1955	61776

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		114	50-150
13C2_8:2FTS		133	50-150
13C2_PFDoA		105	50-150
13C2_PFTeDA		125	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		98	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		110	50-150
13C5_PFHxA		114	50-150
13C5_PFPeA		96	50-150
13C6_PFDA		114	50-150
13C7_PFUdA		112	50-150
13C8_PFOA		121	50-150
13C8_PFOS		116	50-150
13C9_PFNA		112	50-150
d5-EtFOSAA		114	50-150
d3-MeFOSAA		123	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XL03005-004
Description: LHAAP-HWSA-GW-01-112922
Matrix: Aqueous
Date Sampled: 11/29/2022 0930
Project Name: Longhorn AAP PFAS
Date Received: 12/02/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2103	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	UQ	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	UQ	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	UQ	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	UQS	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	163	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA	N	46	50-150
13C2_PFTeDA	N	6.4	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		103	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		78	50-150
13C8_PFOA		105	50-150
13C8_PFOS		96	50-150
13C9_PFNA		103	50-150
d5-EtFOSAA		75	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS) Analysis

SDG #XL03006

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

Report #48354R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XL03006 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-LHSMW23R-112822	XL03006-001	Water	11/28/2022		X		
LHAAP-LHSMW25-112822	XL03006-002	Water	11/28/2022		X		
LHAAP-46WW06-112822	XL03006-003	Water	11/28/2022		X		
LHAAP-47WW48-112922	XL03006-004	Water	11/29/2022		X		
LHAAP-35BWW07-112922	XL03006-005	Water	11/29/2022		X		
LHAAP-LHSMW44-112922	XL03006-006	Water	11/29/2022		X		
LHAAP-LHSMW41-112922	XL03006-007	Water	11/29/2022		X		
LHAAP-LHSMW54-112922	XL03006-008	Water	11/29/2022		X		
LHAAP-LHSMW56R-112922	XL03006-009	Water	11/29/2022		X		
LHAAP-LHSMW45-113022	XL03006-010	Water	11/30/2022		X		
LHAAP-46WW02-113022	XL03006-011	Water	11/30/2022		X		
LHAAP-47WW19-113022	XL03006-012	Water	11/30/2022		X		
LHAAP-47WW42-113022	XL03006-013	Water	11/30/2022		X		
LHAAP-FD-2-GW-113022	XL03006-014	Water	11/30/2022	LHAAP-47WW42-113022	X		
LHAAP-FD-3-GW-112922	XL03006-015	Water	11/29/2022	LHAAP-35BWW07-112922	X		
LHAAP-FD-4-GW-112922	XL03006-016	Water	11/29/2022	LHAAP-LHSMW54-112922	X		
LHAAP-FB-1-GW-112822	XL03006-017	Water	11/28/2022		X		
LHAAP-FB-2-GW-112822	XL03006-018	Water	11/28/2022		X		
LHAAP-FB-3-GW-112922	XL03006-019	Water	11/29/2022		X		
LHAAP-FB-4-GW-113022	XL03006-020	Water	11/30/2022		X		
LHAAP-FB-5-GW-113022	XL03006-021	Water	11/30/2022		X		
LHAAP-VWR-DEB-8-113022	XL03006-022	Water	11/30/2022		X		
LHAAP-PA3-SO-04-112822	XL03006-024	Soil	11/28/2022		X		

DATA REVIEW REPORT

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-FD-2-SO-112822	XL03006-025	Soil	11/28/2022	CANCELLED	X		
LHAAP-FD-5-GW-112922	XL03006-026	Water	11/29/2022	LHAAP-CSA-GW-01-112922	X		
LHAAP-FD-6-GW-112922	XL03006-027	Water	11/29/2022	LHAAP-HWSA-GW-01-112922	X		
LHAAP-SB-01-112922	XL03006-028	Water	11/29/2022		X		
LHAAP-EB-06-112922	XL03006-029	Water	11/29/2022		X		
LHAAP-CSA-GW-01-112922	XL03006-030	Water	11/29/2022		X		
LHAAP-PA3-SO-01-112822	XL03006-031	Soil	11/28/2022		X	X	X

Note:

1. Stage 3/4 validation was performed on sample locations LHAAP-47WW48-112922 and LHAAP-46WW02-113022.
2. Results for parent sample LHAAP-HWSA-GW-01-112922 to field duplicate LHAAP-FD-6-GW-112922 are reported in SDG XL03005 and DVR 481148R.
3. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample locations LHAAP-47WW42-113022, LHAAP-35BWW07-112922, LHAAP-LHSMW54-112922, and LHAAP-CSA-GW-01-112922.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X	X		
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

1. Sample LHAAP-PA3-SO-01-112822 was received but not listed on the COC. The laboratory signed in the sample for TOC, pH, and grain size analysis per email from the project team.
2. Analysis of field duplicate LHAAP-FD-2-SO-112822 was cancelled by the project team.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; “The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report.” Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

R The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. Rejection of the data was decided by the project team and USACE chemist.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

There were PFAS detections in the source blank LHAAP-SB-01-112922. The source blank was used for the initial rinse of the drill during the decontamination process. PFAS compounds were not detected in the equipment blank LHAAP-EB-06-112922. Therefore, the detections in the source blank are not associated with detections in the site sample results.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration, and initial calibration verification (ICV) standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample Locations	Continuing	Compound	Criteria
LHAAP-LHSMW23R-112822 LHAAP-LHSMW25-112822	CCV %D	Perfluoroheptanoic acid (PFHpA)	+35%
LHAAP-PA3-SO-04-112822	CCV %D	8:2 FTS	+33%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Continuing	Criteria	Sample Result	Qualification
Continuing Calibration	%D >30% (increase in sensitivity)	Non-detect	UJ
		Detect	J+
	%D >30% (decrease in sensitivity)	Non-detect	UJ
		Detect	J-
	%D >50%	Non-detect	UX
		Detect	X

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

DATA REVIEW REPORT

Sample Locations	EIS	Associated Compound	%R
LHAAP-LHSMW23R-112822	13C2 6:2 FTS	6:2 FTS	> 150%
	13C4 PFBA	Perfluorobutanoic acid	< 20%
	13C5 PFPeA	Perfluoropentanoic acid	< 50% but > 20%
LHAAP-47WW48-112922	13C2 6:2 FTS	6:2 FTS	> 150%
	13C2 PFDoA	Perfluorododecanoic acid	< 50% but > 20%
		Perfluorotridecanoic acid	
	13C2 PFTeDA	Perfluorotetradecanoic acid	< 50% but > 20%
LHAAP-46WW02-113022	13C2 PFTeDA	Perfluorotetradecanoic acid	< 50% but > 20%
	13C4 PFBA	Perfluorobutanoic acid	< 50% but > 20%
LHAAP-47WW19-113022 LHAAP-CSA-GW-01-112922	13C2 PFTeDA	Perfluorotetradecanoic acid	< 50% but > 20%
LHAAP-FD-4-GW-112922	13C2 6:2 FTS	6:2 FTS	> 150%
	13C2 PFTeDA	Perfluorotetradecanoic acid	< 50% but > 20%
LHAAP-LHSMW45-113022 LHAAP-FD-3-GW-112922 LHAAP-FB-3-GW-112922 LHAAP-FB-4-GW-113022 LHAAP-PWTP-DEB-9-113022 LHAAP-EB-06-112922	13C2 6:2 FTS	6:2 FTS	> 150%
LHAAP-FD-5-GW-112922	13C2 8:2 FTS	8:2 FTS	> 150%
LHAAP-FD-6-GW-112922	13C2 PFDoA	Perfluorododecanoic acid	< 50% but > 20%
		Perfluorotridecanoic acid	
	13C2 PFTeDA	Perfluorotetradecanoic acid	< 20%

The project team and USACE chemist decided that compounds associated with EIS exhibiting recoveries less than 20 percent will be rejected.

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD performed on sample locations LHAAP-35BWW07-112922, LHAAP-LHSMW54-112922, and LHAAP-CSA-GW-01-112922 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

Sample locations associated with the MS/MSD exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
LHAAP-47WW42-113022	Perfluorobutanoic acid	<LL but >10%	AC

Note:
AC Acceptable
LL Lower control limit

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J+
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	UX
	Detect	J-
SR>4X: Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
LHAAP-47WW42-113022/ LHAAP-FD-2-GW-113022	Perfluorobutaonoic acid	8.2	3.9	AC
	Perfluoroheptanoic acid	2.0 J	1.9 U	
	Perfluorohexanoic acid	2.7 J	1.9 U	
	Perfluorooctanoic acid	6.2	5.3	
	Perfluoropentanoic acid	4.4	2.0 J	
LHAAP-35BWW07-112922/ LHAAP-FD-3-GW-112922	All target PFAS compounds	U	U	AC
LHAAP-LHSMW54-112922/ LHAAP-FD-4-GW-112922	Perfluorobutaonoic acid	3.6 J	3.7 J	AC
	Perfluoropentanoic acid	2.0 J	2.0 J	
LHAAP-CSA-GW-01-112922/ LHAAP-FD-5-GW-112922	All target PFAS compounds	U	U	AC
LHAAP-HWSA-GW-01-112922/ LHAAP-FD-6-GW-112922	All target PFAS compounds	U	U	AC

Notes:
AC Acceptable

The calculated results between the parent samples and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to "M" and preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

10. System Performance and Overall Assessment

The case narrative notes that samples LHAAP-LHSMW23R-112822, LHAAP-46WW06-112822, LHAAP-47WW48-112922, LHAAP-LHSMW44-112922, LHAAP-LHSMW54-112922, LHAAP-LHSMW56R-112922, LHAAP-46WW02-113022, LHAAP-47WW19-113022, LHAAP-FD-3-GW-112922, LHAAP-FD-4-GW-112922, LHAAP-VWR-DEB-8-113022, LHAAP-PWTP-DEB-9-113022, LHAAP-FD-5-GW-112922, LHAAP-FD-6-GW-112922, and LHAAP-CSA-GW-01-112922 required centrifugation prior to extraction,

due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of methanol. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <5mL and reconstituted to 5mL using methanol by transfer pipet. Therefore, the sample results were not qualified for the sample preparation modification.

The case narrative noted that for sample LHAAP-FD-6-GW-112922, the sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Therefore, all PFAS compounds are qualified as estimated (UJ,J-) for these sample locations.

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X	X		
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 9045D and 9060A. Data were reviewed in accordance with Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers

  U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

  J The reported value was obtained from a reading less than the limit of detection (LOQ), but greater than or equal to the detection limit (DL).

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

- Validation Qualifiers

  J The reported result was an estimated value with an unknown bias.

  J+ The result was an estimated quantity, but the result may be biased high.

  J- The result was an estimated quantity, but the result may be biased low.

  UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Total Organic Carbon (TOC) by SW846 9060A	Soil	28 days from collection to analysis	Cool to <6 °C.
pH by SW846 9045D	Soil	Within 24 hours of receipt at laboratory	Cool to <6 °C.

The analyses that exceeded the holding time are presented in the following table.

Sample Locations	Holding Time	Criteria
LHAAP-PA3-SO-01-112822 (pH)	21 days from collection	< 24 hours from receipt
LHAAP-PA3-SO-01-112822 (TOC)	43 days from collection	< 28 days

Sample results associated with sample locations analyzed by analytical method SW-846 9045D and 9060A were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification
	Detected Analytes
Analysis completed past holding time (pH)	J
Analysis completed past holding time but less than twice the holding time (TOC)	J-

The sample submitted for TOC was subcontracted to Pace Analytical located at Green Bay, WI. The sample was received at the subcontract lab after the hold time had expired.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

TOC was not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of

acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all initial calibration verification standard recoveries were within control limits. The calibration verification limit for pH is within ± 0.05 su of the true value.

All calibration standard results for pH were within the control limit.

Calibration information was not supplied for TOC; received a stage 2a report.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater.

A MS analysis was not performed for TOC.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the LOQ. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of one time the LOQ is applied for water matrices and two times the LOQ for soil matrices. The laboratory duplicate control limits for soil pH is ≤ 0.1 su.

A laboratory duplicate analysis was not performed for pH and TOC.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of three times the LOQ is applied for soil matrices.

A field duplicate was not collected for pH and TOC.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

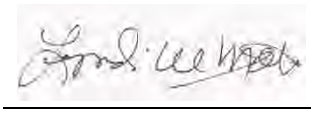
DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW846 9045D/9060A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate(LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate(MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Lab Duplicate (RPD)	X				X
Field Duplicate (RPD)	X				X
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation (pH only)					
Initial calibration correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculations acceptable		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:
%R - percent recovery
RPD - relative percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Lyndi Mott, Arcadis

SIGNATURE: 

DATE: January 21, 2023

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 6, 2023

Stage 3 / 4
PFAS Calibration Standards

SDG #: XL03006 Date: 1/21/2023
Lab: Pace (Shealy) Page: 1
Project: Longhorn AAP PFAS PA/SI Validated by: LWM

Method: EPA modified 537 per DoD QSM 5.3

PFOS 11/17/2022 Calibration Page 643

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
92.8	14167	279107	2000	0.050758	1.0939291	1.160609	87.47	92.8	94.25	94.3	MATCH
185.6	29183	259957	2000	0.112261	1.2097077	1.160609	193.45	185.6	104.23	104.2	MATCH
464	70984	274341	2000	0.258744	1.1152745	1.160609	445.88	464	96.09	96.1	MATCH
928	148822	265877	2000	0.55974	1.2063363	1.160609	964.56	928	103.94	103.9	MATCH
1856	289465	275666	2000	1.050057	1.1315269	1.160609	1809.49	1856	97.49	97.5	MATCH
4640	710015	271829	2000	2.611991	1.1258583	1.160609	4501.07	4640	97.01	97.0	MATCH
9280	1490516	276045	2000	5.39954	1.163694	1.160609	9304.67	9280	100.27	100.3	MATCH
13920	2297108	272804	2000	8.42036	1.2098219	1.160609	14510.24	13920	104.24	104.2	MATCH
18560	3143540	284818	2000	11.03701	1.1893333	1.160609	19019.35	18560	102.47	102.5	MATCH
				Avg RF	1.1606091	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XL03006 Date: 1/21/2023
Lab: Pace (Shealy) Page: 2
Project: Longhorn AAP PFAS PA/SI Validated by: LWM

Method: EPA modified 537 per DoD QSM 5.3

ICV 1000 12/16/2022 15:61 Page 1166

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBA	924.88	1000	92.49	92.5	MATCH
PFOA	837.03	1000	83.70	83.7	MATCH
PFPeA	912.71	1000	91.27	91.3	MATCH

CCV 200 12/15/2022 12:34 Page 2154

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBA	193.46	200	96.73	96.7	MATCH
PFOA	201	200	100.50	100.5	MATCH
PFPeA	197.02	200	98.51	98.5	MATCH

ICV 1000 11/17/2022 14:03 Page 861

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFHxS	1013.66	1000	101.37	101.4	MATCH
PFOA	828.6	1000	82.86	82.9	MATCH
PFOS	802.92	1000	80.29	80.3	MATCH

CCV 200 12/15/2022 12:34 Page 1937

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFHxS	207.04	182	113.76	113.8	MATCH
PFOA	197.49	200	98.75	98.7	MATCH
PFOS	193.06	185.6	104.02	104	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XL03006 Date: 1/21/2023
Lab: Pace (Shealy) Page: 3
Project: Longhorn AAP PFAS PA/SI Validated by: LWM

Method: EPA modified 537 per DoD QSM 5.3

LCS XQ62552-002 Page 2867
LCMSMS02 Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBA	654458	1648188	2000	0.397077	0.951865	834.31	250	16.686	16	104.29	104	MATCH
PFOA	660978	1623152	2000	0.407219	0.980653	830.51	250	16.610	16	103.81	104	MATCH
PFPeA	708466	1613589	2000	0.439062	1.041076	843.48	250	16.870	16	105.43	105	MATCH

LCS XQ62552-002 Page 2830
LCMSMS02 Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHxS	152603	371099	2000	0.411219	1.06682	770.93	250	15.419	15	102.79	106	MATCH
PFOA	613516	1457798	2000	0.420851	0.981342	857.71	250	17.154	16	107.21	107	MATCH
PFOS	155974	349386	2000	0.446423	1.160609	769.29	250	15.386	15	102.57	104	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated amount ng/L = ((calculated ng/L x 10 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XL03006 Date: 1/21/2023
Lab: Pace (Shealy) Page: 4
Project: Longhorn AAP PFAS PA/SI Validated by: LWM

Method: EPA modified 537 per DoD QSM 5.3

MS/MSD Sample ID	LHAAP-47WW42-113022
ANALYTE	PFBA
REPORTED MS %R	68
REPORTED MSD %R	78
REPORTED RPD	7.7

Page 2981 and 3064

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}} \qquad RPD = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration	8.2			
MS Concentration	18.277	MS %R	67.18	MATCH
MSD Concentration	19.75	MSD %R	77.00	MATCH
MS TV	15	RPD	7.75	MATCH
MSD TV	15			

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XL03006
Lab: Pace (Shealy)
Project: Longhorn AAP PFAS PA/SI

Date: 1/20/2023
Page: 5
Validated by: LWM

Method: EPA modified 537 per DoD QSM 5.3

LHAAP-47WW48-112922 Lab ID: XL03006-004 Page 171
Instrument: LCMSMS02 12/19/2022 21:47 Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBA	757542	1014344	2000	0.746829	0.951865	1569.19	5	281.16	27.91	28	Match
PFOA	110469	1594471	2000	0.069283	0.980653	141.30	5	281.16	2.51	2.5 J	Match
PFPeA	922107	1421979	2000	0.648467	1.041076	1245.76	5	281.16	22.15	22	Match

LHAAP-46WW02-113022 Lab ID: XL03006-011 Page 235
Instrument: LCMSMS02 12/15/2022 19:58 Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	44259	358211	2000	0.123556	1.06682	231.63	5	265.88	4.36	4.4	Match
PFOA	996864	1339557	2000	0.744174	0.981342	1516.65	5	265.88	28.52	29	Match
PFOS	166455	325926	2000	0.510714	1.160609	880.08	5	265.88	16.55	17	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 10 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #:	XL03006	Date:	1/20/2023
Lab:	Pace (Shealy)	Page:	6
Project:	Longhorn AAP PFAS PA/SI	Validated by:	LWM

Method: EPA modified 537 per DoD QSM 5.3

LHAAP-47WW48-112922 Lab ID: XL03006-004

EIS 13C8 PFOA
REPORTED EIS %R 103

%R = 100 * EIS Area / CCV 200 EIS Area

EIS Area 1594471 Page 173
CCV 200 EIS Area 1551941 Page 2154
%R 102.7

LHAAP-46WW02-113022 Lab ID: XL03006-011

EIS 13C4 PFBA
REPORTED EIS %R 41

%R = 100 * EIS Area / CCV 200 EIS Area

EIS Area 577173 Page 236
CCV 200 EIS Area 1400250 Page 1937
%R 41.2

CHAIN OF CUSTODY
SAMPLE ANALYSIS DATA SHEETS

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PACE ANALYTICAL SERVICES, LLC
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Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Pace Analytical

Number 139204

Client: USACE	Report to Contact:	Telephone No. / E-mail: 601-340-1272 Doris.Schmidt@arcadis.com	Cooler No.
Address: Zeugner Dr.	Sampler's Signature: x Laura Garcia	Analysis (Attach list if more space is needed)	Page ___ of ___
City: Karnack	State: TX	Zip Code: 75661	Printed Name: Laura Garcia
Project Name: LHAAP			XL03006 KEM
Project No.: 300019917	P.O. No.		Remarks / Cooler I.D.

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	# of Grab / # of Composite	Matrix: Aqueous	Soil	Non-Aqueous	No. of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	NaOH/ZnAc	Ascorbic Acid	MS/MSD PFAS QSM	Remarks / Cooler I.D.
LHAAP-LHSMW23R-112822	11-28-22	14:45	G	X			X							X	
LHAAP-LHSMW25-112822	11-28-22	16:30													
LHAAP-46WW06-112822	11-28-22	12:50													
LHAAP-47WW48-112922	11-29-22	14:00													
LHAAP-35BWW07-112922	11-29-22	09:20													MS/MSD
LHAAP-LHSMW44-112922	11-29-22	14:20													
LHAAP-LHSMW41-112922	11-29-22	10:45													
LHAAP-LHSMW54-112922	11-29-22	16:15													MS/MSD
LHAAP-LHSMW56R-112922	11-29-22	15:40													
LHAAP-LHSMW45-113022	11-30-22	12:40													

Turn Around Time Required (Prior lab approval required for expedited TAT.): [X] Standard [ ] Rush (Specify)

Sample Disposal: [ ] Return to Client [X] Disposal by Lab

Possible Hazard Identification: [ ] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison [X] Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Laura Garcia	11-30-22		1. Received by		
2. Relinquished by:	11-30-22	1510	2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: Fed Ex	12/02/22	1600	4. Laboratory received by: Paula N Roberts	12/02/22	1600

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY: Received on ice (Circle) (Yes) No Ice Pack Receipt Temp 2.1 °C Temp Blank Y N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

PACE ANALYTICAL SERVICES, LLC

Pace Analytical®

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105 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 139210

Client: USACE	Report to Contact	Telephone No. / E-mail: 601-346-1272 Dana.schmich@arcadis.com	Quote No.
Address: 29 Peuguer	Sampler's Signature: x Laura Gloria	Analysis (Attach list if more space is needed)	Page ___ of
City: Kosciusko	State: TX	Zip Code: 75601	Printed Name: Laura Gloria
Project Name: LHAAP			
Project No.: 300019917	P.O. No.		

XL03006

KES?

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Composition	Matrix: Aqueous	Matrix: Solid	Matrix: Non-Aqueous	No. of Containers by Preservative Type: Unpres.	HNO3	H2SO4	NaOH	HCl	Na2S2O3	Other Preserved	PFAS QSM	Remarks / Cooler I.D.
LHAAP-46WW07-113022	11-30-22	09:45	G	X			X							X	
LHAAP-47WW19-113022	11-30-22	12:55													
LHAAP-47WW42-113022	11-30-22	11:30													MS/MSD
LHAAP-FD-2-GW-113022	11-30-22	—													
LHAAP-FD-3-GW-112922	11-29-22	—													
LHAAP-FD-4-GW-112922	11-29-22	—													
LHAAP-FB-1-GW-112822	11-28-22	14:50													
LHAAP-FB-2-GW-112822	11-28-22	16:35													
LHAAP-FB-3-GW-112922	11-29-22	09:45													
LHAAP-FB-4-GW-113022	11-30-22	11:20	▼	▼			▼							▼	

Turn Around Time Required (Prior lab approval required for expedited TAT)
☒ Standard ☐ Rush (Specify)

Sample Disposal
☐ Return to Client ☒ Disposal by Lab

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☒ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: Laura Gloria	11-30-22	1510	1. Received by:		
2. Relinquished by:	11-30-22	1510	2. Received by:		
3. Relinquished by:			3. Received by:		
4. Relinquished by: FED EX	12/02/22	1600	4. Laboratory received by: Haylee N Roberts	12/02/22	1600

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) (Yes) No Ice Pack — Receipt Temp. 2.1 °C — Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME000002-01

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Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 139206

Client: USACE	Report to Contact	Telephone No. / E-mail: 907-376-1272 Dana.Schmidt@arcadis.com	Quote No.
Address: Zeugner	Sampler's Signature: X Laura Gloria	Analysis (Attach list if more space is needed)	Page ___ of ___
City: Karnack; State: TX; Zip Code: 75661	Printed Name: Laura Gloria		
Project Name: LHAAP			
Project No.: 300G9917	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Type (G=Grab, C=Composite)	Matrix: Aqueous	Solid	Non-Aqueous	No. of Containers / Preservative Type: Unpres	HNO3	HCl	NaOH	H2SO4	Na2S2O3	Field Filtered	Analysis: PFAS QSM	Remarks / Cooler I.D.
LHAAP-FB-S-GW-113022		12:55	G	X			X							X	
LHAAP-VWR-DEB-S-113022	11-30-22	08:50	C	X											
LHAAP-PWTP-DEB-S-113022	11-30-22	09:30	C	X											
LHAAP-PA3-SO-04-112822	11-28-22	15:25	G		X										
LHAAP-FD-2-SO-112822	11-28-22	—	G		X										
LHAAP-FD-S-GW-112922	11-29-22	—	G	X			X							X	
LHAAP-FD-16-GW-112922	11-29-22	—	G	X			X							X	
LHAAP-SB-01-112922	11-29-22	14:50	G	X			X							X	
LHAAP-EB-06-112922	11-29-22	16:10	G	X			X							X	
LHAAP-CSA-GW-01-112922	11-29-22	12:00	G	X			X							X	MS/MSD

XL03006
KER2

Turn Around Time Required (Prior lab approval required for expedited TAT.): X Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client X Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison X Unknown

QC Requirements (Specify)

	Relinquished by	Date	Time	Received by	Date	Time
1.	Laura Gloria	11-30-22	1515			
2.		11-30-22	1515			
3.						
4.	Fed ex	12/02/22	1600	Laura N Roberts	12/02/22	1600

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle): (Yes) No Ice Pack
Receipt Temp: 2.1 °C
Temp Blank: ☐ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME03SN2-01

PACE ANALYTICAL SERVICES, LLC

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: USACE Cooler Inspected by/date: KNR / 12/02/2022 Lot #: XL03006

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: 22-2027

2.1 /2.1 °C NA /NA °C NA /NA °C NA /NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☑ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 26215

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA

Comments: EXCESS: 031 not listed on COC

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-001**
Description: **LHAAP-LHSMW23R-112822** Matrix: **Aqueous**
Date Sampled: **11/28/2022 1445** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/14/2022 1645	BWS	12/13/2022 1134	62514

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UQ	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	UQ R	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U J	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.0**	**JQ** J+	**3.8**	1.9	**0.95**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	M-03N	170	50-150
13C2_8:2FTS		121	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		66	50-150
13C3_PFHxS		100	50-150
13C4_PFBA	M-03N	19	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		74	50-150
13C5_PFPeA	N	47	50-150
13C6_PFDA		106	50-150
13C7_PFUdA		107	50-150
13C8_PFOA		108	50-150
13C8_PFOS		111	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-002**
Description: **LHAAP-LHSMW25-112822** Matrix: **Aqueous**
Date Sampled: **11/28/2022 1630** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/14/2022 1656	BWS	12/13/2022 1134	62514

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	UM-03	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		116	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		95	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		85	50-150
13C5_PFHxA		89	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		96	50-150
13C8_PFOS		96	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-003**
Description: **LHAAP-46WW06-112822** Matrix: **Aqueous**
Date Sampled: **11/28/2022 1250** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2136	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		129	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		75	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		103	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		102	50-150
13C8_PFOS		95	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		75	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-004**
Description: **LHAAP-47WW48-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1400** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2147	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	UQ	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**28**		**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	UQ	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.7**		**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**4.3**	**M-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**2.5**	**JM-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**22**		**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	UQ	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	UQ	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	163	50-150
13C2_8:2FTS		89	50-150
13C2_PFDoA	N	49	50-150
13C2_PFTeDA	N	28	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		99	50-150
13C4_PFBA		63	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		65	50-150
13C8_PFOA		103	50-150
13C8_PFOS		88	50-150
13C9_PFNA		94	50-150
d5-EtFOSAA		69	50-150
d3-MeFOSAA		74	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-005**
Description: **LHAAP-35BWW07-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 0920** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/14/2022 2206	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		145	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		95	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		103	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		104	50-150
13C5_PFHxA		109	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		103	50-150
13C8_PFOS		97	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		93	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-006**
Description: **LHAAP-LHSMW44-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1420** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2158	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		137	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA		59	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		106	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		97	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		109	50-150
13C8_PFOS		94	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		74	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-007**
Description: **LHAAP-LHSMW41-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1045** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/14/2022 2239	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		132	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		101	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		104	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		106	50-150
13C8_PFOS		95	50-150
13C9_PFNA		100	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-008**
Description: **LHAAP-LHSMW54-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1615** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/16/2022 1702	MMM	12/14/2022 1012	62629

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.6**	**J**	**3.7**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.0**	**J**	**3.7**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		104	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		84	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		72	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		104	50-150
13C8_PFOS		102	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-009**

Description: **LHAAP-LHSMW56R-112922** Matrix: **Aqueous**

Date Sampled: **11/29/2022 1540** Project Name: **LHAAP PFAS**

Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 1936	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.3**	**M-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.9**	**JM-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.1**	**J**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**85**		**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**3.4**	**J**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		136	50-150
13C2_8:2FTS		83	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		60	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		101	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		107	50-150
13C8_PFOS		92	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		79	50-150
d3-MeFOSAA		77	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-010**
Description: **LHAAP-LHSMW45-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 1240** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 1947	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.6**	**J**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	UM-03	3.9	2.0	0.96	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.3**	**JM-03**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	217	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		104	50-150
13C4_PFBA		78	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		117	50-150
13C8_PFOS		98	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-011**
Description: **LHAAP-46WW02-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 0945** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 1958	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**4.4**	**M-03** M	**3.8**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	UQ UJ	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.4**	**J**	**3.8**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**29**	**M-03** M	**3.8**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	UQ UJ	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**17**	**M-03** M	**3.8**	1.9	**0.94**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		136	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		83	50-150
13C2_PFTeDA	N	46	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		109	50-150
13C4_PFBA	N	41	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		76	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		96	50-150
13C8_PFOA		105	50-150
13C8_PFOS		102	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		76	50-150
d3-MeFOSAA		80	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-012**
Description: **LHAAP-47WW19-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 1255** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2232	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	UQ	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

UJ

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		135	50-150
13C2_8:2FTS		79	50-150
13C2_PFDoA		52	50-150
13C2_PFTeDA	N	42	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		99	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		89	50-150
13C7_PFUdA	M-03	67	50-150
13C8_PFOA		106	50-150
13C8_PFOS		93	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		57	50-150
d3-MeFOSAA		63	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-013**
Description: **LHAAP-47WW42-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 1130** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2009	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q		LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U		7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U		7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U		7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U		7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.2**	**S**	J-	**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**2.0**	**J**		**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**2.7**	**JM-03**	JM	**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**6.2**	**M-03**	M	**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**4.4**	**M-03**	M	**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U		3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		138	50-150
13C2_8:2FTS		104	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		107	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		113	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		105	50-150
13C8_PFOA		112	50-150
13C8_PFOS		109	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-014**
Description: **LHAAP-FD-2-GW-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2043	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.9**		**3.8**	1.9	**0.96**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**5.3**		**3.8**	1.9	**0.96**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.0**	**JM-03** JM	**3.8**	1.9	**0.96**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.96	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		147	50-150
13C2_8:2FTS		102	50-150
13C2_PFDoA		100	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		110	50-150
13C4_PFBA		82	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		109	50-150
13C7_PFUdA		108	50-150
13C8_PFOA		112	50-150
13C8_PFOS		110	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-015**
Description: **LHAAP-FD-3-GW-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2054	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	163	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		103	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		106	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		115	50-150
13C8_PFOS		98	50-150
13C9_PFNA		104	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-016**
Description: **LHAAP-FD-4-GW-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2243	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UQ	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.7**	**J**	**3.8**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**2.0**	**J**	**3.8**	1.9	**0.94**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	UQ	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	162	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		70	50-150
13C2_PFTeDA	N	46	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		100	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		110	50-150
13C8_PFOS		100	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		78	50-150
d3-MeFOSAA		81	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-017**
Description: **LHAAP-FB-1-GW-112822** Matrix: **Aqueous**
Date Sampled: **11/28/2022 1450** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2105	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.4	U	6.8	3.4	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.85	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		149	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		100	50-150
13C2_PFTeDA		96	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		109	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		105	50-150
13C6_PFDA	M-03	104	50-150
13C7_PFUdA		104	50-150
13C8_PFOA		114	50-150
13C8_PFOS		102	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-018**
Description: **LHAAP-FB-2-GW-112822** Matrix: **Aqueous**
Date Sampled: **11/28/2022 1635** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2138	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.8	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		145	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		112	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		105	50-150
13C8_PFOA		113	50-150
13C8_PFOS		110	50-150
13C9_PFNA		110	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
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J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-019**
Description: **LHAAP-FB-3-GW-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 0945** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2150	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.4	UQ	8.7	4.4	2.2	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.4	U	8.7	4.4	2.2	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.2	U	4.4	2.2	1.1	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	210	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		108	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		108	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		122	50-150
13C8_PFOS		105	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		83	50-150
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-020**
Description: **LHAAP-FB-4-GW-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 1130** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2201	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	171	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		104	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		115	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		105	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		119	50-150
13C8_PFOS		109	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-021**
Description: **LHAAP-FB-5-GW-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 1255** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2212	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		148	50-150
13C2_8:2FTS		102	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		114	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		112	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		120	50-150
13C8_PFOS		104	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-022**
Description: **LHAAP-VWR-DEB-8-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 0850** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2223	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**5.7**		**3.7**	1.9	**0.93**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		97	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		50	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		110	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		101	50-150
13C8_PFOS		96	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		82	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-023**
Description: **LHAAP-PWTP-DEB-9-113022** Matrix: **Aqueous**
Date Sampled: **11/30/2022 0930** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2234	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	246	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		121	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		122	50-150
13C5_PFHxA		123	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		106	50-150
13C7_PFUdA		98	50-150
13C8_PFOA		118	50-150
13C8_PFOS		105	50-150
13C9_PFNA		112	50-150
d5-EtFOSAA		89	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-024**
Description: **LHAAP-PA3-SO-04-112822** Matrix: **Solid**
Date Sampled: **11/28/2022 1525** Project Name: **LHAAP PFAS** % Solids: **80.9** **12/08/2022 2141**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/20/2022 1942	BWS	12/19/2022 1004	62882

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U J	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**0.0011**	**M-03** M	**0.0011**	0.00055	**0.00023**	**mg/Kg**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		90	50-150
13C2_8:2FTS	M-03	87	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		93	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		93	50-150
13C8_PFOS		101	50-150
13C9_PFNA		99	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-026**
Description: **LHAAP-FD-5-GW-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/29/2022 1614	ALM	12/27/2022 1858	63704

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	UQ	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UM-03	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	UM-03	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		126	50-150
13C2_8:2FTS	N	153	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		78	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		106	50-150
13C4_PFBA		70	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		108	50-150
13C7_PFUdA		107	50-150
13C8_PFOA		106	50-150
13C8_PFOS		104	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		120	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-027**
Description: **LHAAP-FD-6-GW-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2254	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q		LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.5	U	UJ	11	5.5	2.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.5	U		11	5.5	2.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.5	U		11	5.5	2.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.5	U		11	5.5	2.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.7	UQ		5.3	2.7	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.7	UQ	R	5.3	2.7	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.7	UQ	UJ	5.3	2.7	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.7	U		5.3	2.7	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	M-03	94	50-150
13C2_8:2FTS		70	50-150
13C2_PFDoA	N	40	50-150
13C2_PFTeDA	N	6.8	50-150
13C3_PFBS		73	50-150
13C3_PFHxS		78	50-150
13C4_PFBA		70	50-150
13C4_PFHpA		73	50-150
13C5_PFHxA		75	50-150
13C5_PFPeA		78	50-150
13C6_PFDA	M-03	72	50-150
13C7_PFUdA		55	50-150
13C8_PFOA		76	50-150
13C8_PFOS	M-03	77	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		51	50-150
d3-MeFOSAA		63	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-028**
Description: **LHAAP-SB-01-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1450** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2245	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q		LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U		7.8	3.9	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U		7.8	3.9	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U		7.8	3.9	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U		7.8	3.9	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**4.4**			**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**3.3**	**J**		**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**8.2**			**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U		3.9	2.0	0.98	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U		3.9	2.0	0.98	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**3.2**	**J**		**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**9.2**			**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U		3.9	2.0	0.98	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.6**	**J**		**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**9.7**			**3.9**	2.0	**0.98**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U		3.9	2.0	0.98	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U		3.9	2.0	0.98	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U		3.9	2.0	0.98	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**3.9**	**M-03**	M	**3.9**	2.0	**0.98**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		149	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		105	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		111	50-150
13C4_PFBA		80	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		112	50-150
13C7_PFUdA		110	50-150
13C8_PFOA		110	50-150
13C8_PFOS		105	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-029**
Description: **LHAAP-EB-06-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1610** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/15/2022 2256	ALM	12/13/2022 1422	62552

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	169	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		108	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		107	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		115	50-150
13C8_PFOS		110	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		88	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **XL03006-030**
Description: **LHAAP-CSA-GW-01-112922** Matrix: **Aqueous**
Date Sampled: **11/29/2022 1200** Project Name: **LHAAP PFAS**
Date Received: **12/02/2022** Project Number: **30001997**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/16/2022 1740	MMM	12/14/2022 1012	62629

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UM-03	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	UQ	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	UM-03	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		112	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		80	50-150
13C2_PFTeDA	N	29	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		72	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		93	50-150
13C8_PFOA		103	50-150
13C8_PFOS		104	50-150
13C9_PFNA		109	50-150
d5-EtFOSAA		91	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
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W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
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Inorganic non-metals

Client: **Arcadis U.S., Inc.**		Laboratory ID: **XL03006-031**	
Description: **LHAAP-PA3-SO-01-112822**		Matrix: **Solid**	
Date Sampled: **11/28/2022 1400**	Project Name: **LHAAP PFAS**	% Solids: **83.1**	**12/06/2022 0547**
Date Received: **12/02/2022**	Project Number: **30001997**		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/19/2022 1325	BMG2		62895

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 13.2 ° C		**9045D**	**6.0**	J				**su**	**1**

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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L1256735

Chain of Custody

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Workorder: XL03006 Workorder Name: LHAAP Owner Received Date: 12/2/2022 Results Requested By: 1/13/2023

Report To:	Subcontract To:
Kathy E. Smith Pace Analytical 106 Vantage Point Drive Columbia SC, 29223 803-227-2704 Kathy.Smith@pacelabs.com	Project # Pace Green Bay

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: UP	Requested Analysis: TOC by 9060 Quad	
1	LHAAP-PA3-SO-01-112822	grab	11/28/2022 @ 1400	XL03006-031	Solid	X	X	001
2								
3								
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Kristen Bowman Midwest Fed Ex	01/04/23 1900			Ok to run past hold per Kathy S/AT Lane 1/5/23
2		1/5/23 10:25	Mark Pace	1/5/23 10:25	
3					

Quad per Kathy/AT 1/5/23

Cooler Temperature on Receipt _____ °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document.
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: XL03006 LHAAP
Pace Project No.: 40256735

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

C4	Sample container did not meet EPA or method requirements.
H3	Sample was received or analysis requested beyond the recognized method holding time.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: XL03006 LHAAP
Pace Project No.: 40256735

Sample: LHAAP-PA3-SO-01-112822 **Lab ID: 40256735001** Collected: 11/28/22 14:00 Received: 01/05/23 10:25 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Percent Moisture	Analytical Method: ASTM D2974-87 Pace Analytical Services - Green Bay							
Percent Moisture	**25.7**	%	0.10	1		01/10/23 14:18		
Total Organic Carbon Quad	Analytical Method: EPA 9060 Pace Analytical Services - Green Bay							
~~Total Organic Carbon~~	~~**1890**~~	~~mg/kg~~	~~1420~~	~~1~~		~~01/10/23 07:15~~	~~7440-44-0~~	
Total Organic Carbon	**2130**	mg/kg	1410	1		01/10/23 07:20	7440-44-0	
Total Organic Carbon	~~**2380**~~	mg/kg	1420	1		01/10/23 07:25	7440-44-0	
~~Total Organic Carbon~~	~~**2190**~~	~~mg/kg~~	~~1400~~	~~1~~		~~01/10/23 07:30~~	~~7440-44-0~~	
Mean Total Organic Carbon	**2150** J-	mg/kg	1410	1		01/10/23 07:15	7440-44-0	C4,H3
Surrogates								
RSD%	**9.3**	%		1		01/10/23 07:15		

REPORT OF LABORATORY ANALYSIS

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ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS) Analyses

SDG # XL05008

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

Report # 48119R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XL05008 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-47WW49-113022	XL05008-001	Water	11/30/2022		X		
LHAAP-SB-2-120122	XL05008-002	Water	12/01/2022		X		
LHAAP-EB-2-112822	XL05008-003	Water	11/28/2022		X		
LHAAP-EB-1-120122	XL05008-004	Water	12/01/2022		X		
LHAAP-EB-3-120122	XL05008-005	Water	12/01/2022		X		
LHAAP-EB-4-120122	XL05008-006	Water	12/01/2022		X		
LHAAP-EB-5-120122	XL05008-007	Water	12/01/2022		X		
LHAAP-EB-6-120122	XL05008-008	Water	12/01/2022		X		

Notes:

1. Stage 3/4 validation was performed on sample location LHAAP-47WW49-113022.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was not performed on sample location.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; “The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report.” Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard must be within 70-130% of their true value.

The initial calibration, calibration standards, and ICV standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the continuing calibration standards were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Location	EIS	Associated Compounds	%R
LHAAP-47WW49-113022	13C2_6:2FTS	6:2 FTS	> 150%
	13C2_PFDoA	Perfluoro-n-dodecanoic acid (PFDoA)	< 50% but > 20%
		Perfluoro-n-tridecanoic acid (PFTrDA)	
	13C2_PFTeDA	Perfluoro-n-tetradecanoic acid (PFTeDA)	< 50% but > 20%

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3

acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis was not performed on sample location associated with this SDG.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three time the LOQ for soil matrices.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

The case narrative notes that sample LHAAP-47WW49-113022 required centrifugation prior to extraction, due to excessive solids present in the sample. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; sample was spiked with Surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4mL of methanol each. Centrifuge bottle rinsate was added to the elution. Samples concentrated to <10mL and reconstituted to 10mL using methanol by transfer pipet. Hence, the target compounds were not qualified for the sample preparation modification.

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to "M" and preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Field Duplicate (RPD)	X				X
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Pruthvi Kumar C, Arcadis

SIGNATURE:

DATE: January 2, 2023

PEER REVIEW: Dennis Capria, Arcadis

DATE: January 19, 2023

Stage 3 / 4
PFAS Calibration Standards

SDG #: XL05008 Date: 01/02/2023
Lab: Pace (Shealy) Page: 1
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3
Instrument : LCMSMS02.i
PFBS 12/16/2022 Calibration Pg 358-368 of SDG XL05008

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
88.4	20890	440941	2000	0.047376	1.07185	1.175641	80.60	88.4	91.17	91.2	MATCH
176.8	50829	491324	2000	0.103453	1.17028	1.175641	175.99	176.8	99.54	99.5	MATCH
442.0	117633	485333	2000	0.242376	1.09672	1.175641	412.33	442.0	93.29	93.3	MATCH
884.0	258550	491160	2000	0.526407	1.19097	1.175641	895.52	884.0	101.30	101.3	MATCH
1768.0	494836	477891	2000	1.035458	1.17133	1.175641	1761.52	1768.0	99.63	99.6	MATCH
4420.0	1222386	472517	2000	2.586967	1.17057	1.175641	4400.95	4420.0	99.57	99.6	MATCH
8840.0	2516604	457203	2000	5.504347	1.24533	1.175641	9363.99	8840.0	105.93	105.9	MATCH
13260.0	3481053	437033	2000	7.965195	1.20139	1.175641	13550.39	13260.0	102.19	102.2	MATCH
17680.0	5076428	454921	2000	11.15892	1.26232	1.175641	18983.55	17680.0	107.37	107.4	MATCH
				Avg RF	1.1756410	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XL05008
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 01/02/2023
Page: 2
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument : LCMSMS02.i
ICV 1000_SVLC-2298 16-Dec-2022 16:15:31

File ID: 121622A013.d
Page 639 of SDG XL05008

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFBA	924.88	1000	92.49	92.5	MATCH
PFHpA	903.83	1000	90.38	90.4	MATCH
PFHxA	966.15	1000	96.62	96.6	MATCH

Instrument : LCMSMS02.i
CCV 1000C_SVLC-2353 19-Dec-2022 22:09:55

File ID: 121922053.d
Page 1054 of SDG XL05008

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFBA	989.77	1000	98.98	99	MATCH
PFHpA	1031.30	1000	103.13	103.1	MATCH
PFHxA	1032.30	1000	103.23	103.2	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XL05008 Date: 01/02/2023
Lab: Pace (Shealy) Page: 3
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument : LCMSMS02.i
LCS XQ62610-002 Pg 1513-1517 of SDG XL05008
This LCS is applicable for the sample LHAAP-47WW49-113022 (XL05008-001) Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFBA	654458	1648188	2000	0.397077	0.951865	834.31	250	16.69	16	104.29	104	MATCH
PFHpA	623578	1400575	2000	0.44523	1.024098	869.51	250	17.39	16	108.69	109	MATCH
PFHxA	706088	1805824	2000	0.391006	0.997427	784.03	250	15.68	16	98.00	98	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated amount ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS Sample Concentration

SDG #: XL05008
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 01/02/2023
Page: 4
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-47WW49-113022 Lab ID: XL05008-001 Page 50 of SDG XL05008
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFBA	1259658	879714	2000	1.431895	0.951865	3008.61	5	185.75	80.99	81	Match
PFHpA	147726	1428756	2000	0.103395	1.024098	201.92	5	185.75	5.44	5.4	Match
PFHxA	297428	1625733	2000	0.18295	0.997427	366.84	5	185.75	9.87	9.9	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #: XL05008 Date: 01/02/2023
Lab: Pace (Shealy) Page: 5
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-47WW49-113022 Lab ID: XL05008-001

EIS 13C3_PFBS
REPORTED EIS %R 86

$$\%R = \frac{100 * \text{EIS Area}}{\text{CCV 200 EIS Area}}$$

EIS Area 491527 Page 51 of SDG XL05008
CCV 200 EIS Area 568714 Page 973 of SDG XL05008
%R 86.4 MATCH

CHAIN OF CUSTODY
SAMPLE ANALYSIS DATA SHEETS

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PACE ANALYTICAL SERVICES, LLC

106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 139205

Client: ARCADIS
Address: 2employer Dr.
City: Kannapolis State: TX Zip Code: 78641
Project Name: LHAAP
Project No.: 30001997
Report To Contact:
Sampler's Signature: Laura Garcia
Printed Name: Laura Garcia
Telephone No. / Email: Dana.Schmidt@arcadis.com
Quote No.:
Page 1 of 1
XL05008
KEY:
Reference / Codes / ID:
EMPTY BOTTLE

P.O. No.:

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date	Collection Time (military)	Grab / Composite	Matrix: Liquid	Matrix: Solid	Matrix: Air	No. of Containers & Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Other	PFAS
LHAAP-47WW491-113022	11/30/22	10:00	G	X			X							X
LHAAP-SB-2-120122	12/01/22	09:30	G	X			X							X
LHAAP-EB-2-11302022	11/29/22	16:00	G	X			X							X
LHAAP-EB-1-12012022	12/01/22	12:00	G	X			X							X
LHAAP-EB-3-120122	12/01/22	13:05	G	X			X							X
LHAAP-EB-4-120122	12/01/22	12:20	G	X			X							X
LHAAP-EB-5-120122	12/01/22	12:10	G	X			X							X
LHAAP-EB-6-120122	12/01/22	12:15	G	X			X							X

Turn Around Time Requested (Prior lab approval required for expedited TAT): Standard / Rush (Specify):

Sample Disposal: Return to Client / Disposal by Lab

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison / Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by: Laura Garcia	12/01/22	12:53
2. Relinquished by: Kimberly M Bradford	12/01/22	12:55
3. Relinquished by:	12.01.22	13:30
4. Relinquished by:	12/2/22	0815

1. Received by:
2. Received by:
3. Received by:
4. Laboratory received by: Rebecca Parker — Date: 12/2/22 — Time: 1935

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle): Yes / No — Ice Pack — Receipt Temp: 0.3 °C
Temp Blank: Y / N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with sample(s); PINK-Retained by client

Document Number: MS000V2-01

SC DHEC No: 32010001 NELAC No: E87653 NC DENR No: 329 NC Field Parameters No: 5639

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: XL05008

Project Name: LHAAP PFAS

Project Number: 30001997.40013

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XL05008-001	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	XL05008-001	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	XL05008-001	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XL05008-001	1	13C2_8:2FTS	M-03
PFAS by ID SOP	XL05008-003	1	13C2_8:2FTS	M-03
PFAS by ID SOP	XL05008-003	1	d5-EtFOSAA	M-03
PFAS by ID SOP	XL05008-004	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	XL05008-004	1	13C2_6:2FTS	M-03
PFAS by ID SOP	XL05008-004	1	13C6_PFDA	M-03
PFAS by ID SOP	XL05008-007	1	d3-MeFOSAA	M-03
PFAS by ID SOP	XQ62610-002	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XQ62610-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ62610-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ62610-002	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	XQ62610-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XQ62610-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ62610-002	1	13C2_8:2FTS	M-03
PFAS by ID SOP	XQ62629-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ63049-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ63049-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ63049-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XQ63049-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ63049-001	1	13C9_PFNA	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XL05008-001
Description: LHAAP-47WW49-113022
Matrix: Aqueous
Date Sampled: 11/30/2022 1000
Project Name: LHAAP PFAS
Date Received: 12/02/2022
Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2305	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.5	U	11	5.5	2.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	5.8	~~JQM-03~~ MJ-	11	5.5	2.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.5	U	11	5.5	2.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.5	U	11	5.5	2.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.7	U	5.4	2.7	1.3	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.7	U	5.4	2.7	1.3	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	81		5.4	2.7	1.3	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.7	U	5.4	2.7	1.3	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.7	~~UQ~~ UJ	5.4	2.7	1.3	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.4		5.4	2.7	1.3	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	9.9	~~M-03~~ M	5.4	2.7	1.3	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.7	U	5.4	2.7	1.3	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.7	U~~M-03~~	5.4	2.7	1.3	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	52		5.4	2.7	1.3	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.7	UQ UJ	5.4	2.7	1.3	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.7	UQ UJ	5.4	2.7	1.3	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.7	U	5.4	2.7	1.3	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.7	U	5.4	2.7	1.3	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	208	50-150
13C2_8:2FTS	M-03	106	50-150
13C2_PFDoA	N	45	50-150
13C2_PFTeDA	N	24	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		98	50-150
13C4_PFBA		54	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		70	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		68	50-150
13C8_PFOA		103	50-150
13C8_PFOS		96	50-150
13C9_PFNA		106	50-150
d5-EtFOSAA		77	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.	Laboratory ID: XL05008-002
Description: LHAAP-SB-2-120122	Matrix: Aqueous
Date Sampled: 12/01/2022 0930	Project Name: LHAAP PFAS
Date Received: 12/02/2022	Project Number: 30001997.40013

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/16/2022 2052	MMM	12/14/2022 1012	62629

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		104	50-150
13C2_8:2FTS		104	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		90	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		104	50-150
13C8_PFOS		102	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL05008-003	
Description: LHAAP-EB-2-112822		Matrix: Aqueous	
Date Sampled: 11/28/2022 1600	Project Name: LHAAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2316	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		138	50-150
13C2_8:2FTS	M-03	88	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		81	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		93	50-150
13C4_PFBA		97	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		95	50-150
13C6_PFDA		88	50-150
13C7_PFUdA		77	50-150
13C8_PFOA		100	50-150
13C8_PFOS		87	50-150
13C9_PFNA		95	50-150
d5-EtFOSAA	M-03	82	50-150
d3-MeFOSAA		79	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL05008-004	
Description: LHAAP-EB-1-120122		Matrix: Aqueous	
Date Sampled: 12/01/2022 1200	Project Name: LHAAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2327	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U M-03	7.4	3.7	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	M-03	143	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		86	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		101	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		98	50-150
13C6_PFDA	M-03	99	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		109	50-150
13C8_PFOS		102	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		98	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL05008-005	
Description: LHAAP-EB-3-120122		Matrix: Aqueous	
Date Sampled: 12/01/2022 1205	Project Name: LHAAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2338	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.94	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		131	50-150
13C2_8:2FTS		87	50-150
13C2_PFDoA		79	50-150
13C2_PFTeDA		77	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		95	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		94	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		98	50-150
13C8_PFOS		92	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL05008-006	
Description: LHAAP-EB-4-120122		Matrix: Aqueous	
Date Sampled: 12/01/2022 1220	Project Name: LHAAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/16/2022 2105	MMM	12/14/2022 1012	62629

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		105	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		104	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		108	50-150
13C3_PFHxS		112	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		113	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		108	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		109	50-150
13C8_PFOS		114	50-150
13C9_PFNA		115	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		107	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL05008-007	
Description: LHAAP-EB-5-120122		Matrix: Aqueous	
Date Sampled: 12/01/2022 1210	Project Name: LHAAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/19/2022 2349	ALM	12/13/2022 1746	62610

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		144	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		88	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		105	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		97	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		93	50-150
13C8_PFOA		105	50-150
13C8_PFOS		102	50-150
13C9_PFNA		100	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA	M-03	101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XL05008-008	
Description: LHAAP-EB-6-120122		Matrix: Aqueous	
Date Sampled: 12/01/2022 1215	Project Name: LHAAP PFAS		
Date Received: 12/02/2022	Project Number: 30001997.40013		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	12/20/2022 1310	BWS	12/19/2022 0902	63049

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		91	50-150
13C2_8:2FTS		104	50-150
13C2_PFDoA		103	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		126	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		84	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		86	50-150
13C8_PFOS		96	50-150
13C9_PFNA		111	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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ARCADIS

Longhorn Army Ammunitions Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS) Analysis

SDG #YA09008

Analyses Performed By:
Pace Analytical South Carolina
West Columbia, South Carolina

Report #48564R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # YA09008 for samples collected in association with the Longhorn Army Ammunitions Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					PFAS
LHAAP-04WW08-010523	YA09008-001	Water	01/05/2023		X
LHAAP-FWDF-DEB-3-010623	YA09008-002	Water	01/06/2023		X
LHAAP-BG3-DEB-4-010623	YA09008-003	Water	01/06/2023		X
LHAAP-PA3-DEB-5-010523	YA09008-004	Water	01/05/2023		X
LHAAP-PWTP-DEB-6-010523	YA09008-005	Water	01/05/2023		X
LHAAP-P2-DEB-7-010523	YA09008-006	Water	01/05/2023		X
LHAAP-EB-7-010523	YA09008-007	Water	01/05/2023		X
LHAAP-FB-6-010523	YA09008-008	Water	01/05/2023		X

Note:

1. Stage 4 validation was performed on sample location LHAAP-BG3-DEB-4-010623.
2. Matrix spike (MS) analysis was performed on sample location LHAAP-FWDF-DEB-3-010623.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

DATA REVIEW REPORT

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

The initial calibration, and initial calibration verification (ICV) standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the initial and continuing calibrations were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	EIS	Associated Compound	%R
LHAAP-BG3-DEB-4-010623	13C2_6:2FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	> 150%
	13C4_PFBA	Perfluorobutanoic acid (PFBA)	< 50% but > 20%
LHAAP-PWTP-DEB-6-010523	13C2_6:2FTS	1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	> 150%
	13C4_PFBA	Perfluorobutanoic acid (PFBA)	< 50% but > 20%

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analyses

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

Sample locations associated with the MS analysis which exhibited a recovery outside of the control limits is presented in the following table.

Sample Locations	Compound	MS Recovery
LHAAP-FWDF-DEB-3-010623	Perfluorobutanoic acid (PFBA)	>UL

Note:
UL Upper control limit

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J+
< the lower control limit (LL) but > 10%	Non-detect	UJ
	Detect	J-
< 10%	Non-detect	UX
	Detect	J-
SR>4X: Parent sample concentration > four times the MS/MSD spiking solution concentration.	Detect	No Action
	Non-detect	

In lieu of an MSD, the laboratory performed a laboratory duplicate analysis for sample LHAAP-PWTP-DEB-6-010523. However, a DEB sample is a dedicated equipment blank for pumps that are permanently located in a monitoring well. The DEB is collected as the first draw from the pump. The contents of each sample container may not be homogeneous. Therefore, the laboratory duplicate results were not evaluated.

7. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) Analysis

The LCS/LCSD analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS/LCSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

Sample locations associated with the LCS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Compound	LCS %R
LHAAP-FWDF-DEB-3-010623	Perfluorobutanoic acid (PFBA)	>UL
LHAAP-BG3-DEB-4-010623		
LHAAP-PA3-DEB-5-010523		
LHAAP-PA3-DEB-5-010523 DL		
LHAAP-PWTP-DEB-6-010523		

Note:
UL Upper control limit

The criteria used to evaluate the LCS recoveries are presented in the following table. In the case of an LCS deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (UL)	Non-detect	No Action
	Detect	J+
< the lower control limit (LL)	Non-detect	UX
	Detect	J-

Samples LHAAP-04WW08-010523, LHAAP-PA2-DEB-7-010523, LHAAP-EB-7-010523, and LHAAP-FB-6-010523 were extracted and analyzed with the out of control LCS. The samples were re-extracted within hold time, therefore results are reported from the re-extraction in preparation batch 65403.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three time the LOQ for soil matrices.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample results associated with compounds that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

DATA REVIEW REPORT

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
LHAAP-PA3-DEB-5-010523	Perfluorobutanoic acid (PFBA)	710 E	770	770 D
	Perfluorohexanoic acid (PFHxA)	550 E	570	570 D
	Perfluoropentanoic acid (PFPeA)	730 E	780	780 D
LHAAP-PA2-DEB-7-010523	Perfluorobutanoic acid (PFBA)	800 E	810	810 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

The case narrative notes that for sample LHAAP-PWTP-DEB-6-010523, the sample matrix prevented full volume from being extracted, precluding method mandated bottle rinse. Elution solvent was aliquoted directly into the reservoir, rinsing the inside. Therefore, all PFAS compounds are qualified as estimated (UJ, J-) for this sample location.

Samples LHAAP-04WW08-010523, LHAAP-BG3-DEB-4-010623, LHAAP-PA3-DEB-5-010523, and LHAAP-PA2-DEB-7-010523 required centrifugation prior to extraction, due to excessive solids present in the samples. Centrifugation was performed following the PFAS Aqueous Centrifuge Protocol; samples were spiked with surrogate (SUR; Extracted Internal Standard/EIS) and shaken vigorously before being poured into a conical bottle and centrifuged. The centrifuged aqueous sample was decanted back into the original sample bottle, off of the condensed solids remaining in the centrifuge bottle. Original sample bottle was rinsed as normal and centrifuge bottle was rinsed with 4 mL of methanol. Centrifuge bottle rinsate was added to the elution. Samples concentrated to < 5 mL and reconstituted to 5 mL using methanol by transfer pipet. The sample results were not qualified for this sample preparation modification.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks		X		X	
C. Field blanks		X		X	
Laboratory Control Sample (LCS) %R		X	X		
Laboratory Control Sample Duplicate (LCSD) %R		X		X	
LCS/LCSD Precision (RPD)		X		X	
Matrix Spike (MS) %R		X	X		
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Laboratory Duplicate Precision (RPD)		X	X		
Field Duplicate (RPD)	X				X
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content	X				X
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
D. Ion Ratio %R		X		X	
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Sharon Pennington, Arcadis

SIGNATURE:

DATE: 02/15/2023

PEER REVIEW: Dennis Capria, Arcadis

DATE: February 28, 2023

Stage 3 / 4
PFAS Calibration Standards

SDG #: YA09008
Lab: Pace Analytical South Carolina
Project: Longhorn AAP PFAS PA/SI

Date: 2/14/2023
Page: 1
Validated by: SKP

Method: EPA modified 537 per DoD QSM 5.3

PFOA, 01/13/2023 Calibration Instrument: LCMSMS02 Pg 252-262 of SDG YA09008

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
100	65621	1288743	2000	0.050919	1.0183722	0.974141	104.54	100	104.54	104.5	MATCH
200	125423	1265803	2000	0.099086	0.9908572	0.974141	203.43	200	101.72	101.7	MATCH
500	317507	1330989	2000	0.23855	0.9541987	0.974141	489.76	500	97.95	98	MATCH
1000	628530	1339814	2000	0.469117	0.9382347	0.974141	963.14	1000	96.31	96.3	MATCH
2000	1263291	1316503	2000	0.959581	0.9595808	0.974141	1970.11	2000	98.51	98.5	MATCH
5000	3124828	1323492	2000	2.361048	0.9444192	0.974141	4847.45	5000	96.95	96.9	MATCH
10000	5835226	1174986	2000	4.966209	0.9932418	0.974141	10196.08	10000	101.96	102	MATCH
15000	8498930	1173939	2000	7.239669	0.9652892	0.974141	14863.70	15000	99.09	99.1	MATCH
20000	11515923	1148061	2000	10.03076	1.0030759	0.974141	20594.06	20000	102.97	103	MATCH
				Avg RF	0.9741411	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: YA09008 Date: 2/14/2023
Lab: Pace Analytical South Carolina Page: 2
Project: Longhorn AAP PFAS PA/SI Validated by: SKP

Method: EPA modified 537 per DoD QSM 5.3

ICV 1000, 01/13/2023 21:11 Page 461 of SDG YA09008
Instrument: LCMSMS02

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFHxS	1156.81	1000	115.68	115.7	MATCH
PFOA	1050.7	1000	105.07	105.1	MATCH
PFOS	944.71	1000	94.47	94.5	MATCH

CCV 200, 01/16/2023 13:59 Page 825 of SDG YA09008
Instrument: LCMSMS02

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFHxS	175.89	182	96.64	96.6	MATCH
PFOA	196.92	200	98.46	98.5	MATCH
PFOS	183.29	185.6	98.76	98.8	MATCH

Stage 3 / 4
PFAS LCS

SDG #: YA09008 Date: 2/14/2023
Lab: Pace Analytical South Carolina Page: 3
Project: Longhorn AAP PFAS PA/SI Validated by: SKP

Method: EPA modified 537 per DoD QSM 5.3

LCS VQ64455-002 Pg 1396 of SDG YA09008
Instrument: LCMSMS02 Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFHxS	138497	325569	2000	0.4254	1.077341	789.72	250	15.79	15	105.30	108	MATCH
PFOA	535799	1246359	2000	0.429891	0.974141	882.61	250	17.65	16	110.33	110	MATCH
PFOS	138983	310023	2000	0.448299	1.168979	766.99	250	15.34	15	102.27	103	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: YA09008 Date: 2/14/2023
Lab: Pace Analytical South Carolina Page: 4
Project: Longhorn AAP PFAS PA/SI Validated by: SKP

Method: EPA modified 537 per DoD QSM 5.3

MS/MSD Sample ID LHAAP-FWDF-DEB-3-010623 Pg 62 of SDG YA09008

ANALYTE	PFBA
REPORTED MS %R	144
REPORTED MSD %R	NA
REPORTED RPD	NA

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}} \qquad RPD = \frac{100 * |\text{MS \%R} - \text{MSD \%R}}{\text{Average of MS MSD \%R}}$$

Sample Concentration	0		
MS Concentration	21	MS %R	140.00 MATCH
MSD Concentration		MSD %R	
MS TV	15	RPD	
MSD TV			

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: YA09008 Date: 2/14/2023
Lab: Pace Analytical South Carolina Page: 5
Project: Longhorn AAP PFAS PA/SI Validated by: SKP

Method: EPA modified 537 per DoD QSM 5.3

LHAAP-BG3-DEB-4-010623 Lab ID: YA09008-003 Page 102 of SDG YA09008
Instrument: LCMSMS02 1/16/2023 16:10

Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFHxS	49790	313575	2000	0.158782	1.077341	294.77	5	279.4	5.27	5.3	Match
PFOA	394266	1123071	2000	0.351061	0.974141	720.76	5	279.4	12.90	13	Match
PFOS	194247	331436	2000	0.586077	1.168979	1002.72	5	279.4	17.94	18	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated amount ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #:	YA09008	Date:	2/14/2023
Lab:	Pace Analytical South Carolina	Page:	6
Project:	Longhorn AAP PFAS PA/SI	Validated by:	SKP

Method: EPA modified 537 per DoD QSM 5.3

LHAAP-BG3-DEB-4-010623 Lab ID: YA09008-003

EIS	13C4_PFBA
REPORTED EIS %R	35%

$$\%R = \frac{100 * \text{EIS Area}}{\text{CCV 200 EIS Area}}$$

EIS Area	493933	Page 103 of SDG YA09008
CCV 200 EIS Area	1412630	Page 827 of SDG YA09008
%R	35.0	

CHAIN OF CUSTODY
SAMPLE ANALYSIS DATA SHEETS

Pace Analytical Services, LLC
106 Vantage Point Drive
West Columbia, South Carolina 29172
Telephone No. (803) 791-9700 Fax No. (803) 791-9111
www.pacelabs.com

Pace Analytical® **Chain of Custody Record**

Number

Client: Arcadis	Report to Contact: Dana Schmidt	Telephone No. / E-mail: Dana.schmidt@arcadis.com / 607-346-1272	Quote No.
Address: 630 Plaza Dr #100	Sampler's Signature: x [signature]	Analysis (Attach list if more space is needed)	Page: 1 of 1
City: Highland Ranch / State: CO / Zip Code: 80129	Printed Name: Daniel Lungaw		YA09008
Project Name: LHAAP PFAS Investigation			KE82
Project Number: 30001997.4013	P.O. No.		Remarks / Cooler I.D.

Sample ID / Description (Containers for each sample may be combined on one line)	Collection Date(s)	Collection Time (military)	Grab/Composite	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	5035 Kit	Field Filtered	PFAS
LHAAP-04WW08- 010523	1/5/23	1305	G	x			x							x
LHAAP-FWDF-DEB-3-010623	1/6/23	0830	G	x			x							x
LHAAP-RG3-DEB-4-010623	1/6/23	0905	G	x			x							x
LHAAP-PA3-DEB-5- 010523	1/5/23	1425	G	x			x							x
LHAAP-PWTP-DEB-6- 010523	1/5/23	1335	G	x			x							x
LHAAP-PA2-DEB-7- 010523	1/5/23	1510	G	x			x							x
LHAAP-EB-8 010523	1/5/23	1390	G	x			x							x
LHAAP-FB-6- 010523	1/5/23	1325	G	x			x							x

Turn Around Time Required (Prior lab approval required for expedited TAT): ☑ Standard ☐ Rush (Please Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification (List any known hazards in the remarks): ☐ Non-Hazardous ☐ Flammable ☐ Skin Irritant ☐ SDS provided ☐ Unknown

QC Requirements

	Date	Time		Date	Time
1. Relinquished by: [signature]	1/6/23	1430	1. Received by		
2. Relinquished by			2. Received by		
3. Relinquished by			3. Received by		
4. Relinquished by: [signature]	1.9.23	940	4. Laboratory Received by: [signature]	1.9.23	940

Note: All samples are retained for four weeks from receipt unless other arrangements are made

LAB USE ONLY — Received on Ice (Check): ☑ ☐ ☐ Ice Pack — Receipt Temp.: 1.0 °C — Temp Blank: ☑ Y / ☐ N

PACE ANALYTICAL SERVICES, LLC

DCff_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: ARCADIS Cooler Inspected by/date: KDRW / 1/09/2023 Lot #: YAC9008

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.0 / 2.0 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☑ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☐ Yes	☐ No	☑ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☐ No	☑ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with _____ mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # _____. ☐
Time of preservation _____. If more than one preservative is needed, please note in the comments below.

Sample(s) _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA

Comments:

Qualtrax ID: 55360 Pace® Analytical Services, LLC Page 1 of 1

DOD PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001 NELAC No: E87653 NC DENR No: 329 NC Field Parameters No: 5639

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: YA09008

Project Name: LHAAP PFAS

Project Number: 30001997.40013

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	YQ64455-002	1	13C4_PFBA	M-03
PFAS by ID SOP	YQ65403-002	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	YQ65403-003	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	YQ65403-002	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YQ65403-003	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	YQ65403-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	YQ65403-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YQ65403-003	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	YQ65403-003	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	YQ65403-003	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	YQ65403-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YQ65403-003	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	YQ65403-003	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	YQ65403-002	1	13C6_PFDA	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-001**
Description: **LHAAP-04WW08-010523** Matrix: **Aqueous**
Date Sampled: **01/05/2023 1305** Project Name: **LHAAP PFAS**
Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1537	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2314	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UM-03	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**7.8**	**L**	**3.6**	1.8	**0.91**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		104	50-150		93	50-150
13C2_8:2FTS		90	50-150		83	50-150
13C2_PFDoA		89	50-150		98	50-150
13C2_PFTeDA		92	50-150		101	50-150
13C3_PFBS		94	50-150		114	50-150
13C3_PFHxS		99	50-150		115	50-150
13C4_PFBA		88	50-150		101	50-150
13C4_PFHpA		95	50-150		137	50-150
13C5_PFHxA		97	50-150		121	50-150
13C5_PFPeA		96	50-150		113	50-150
13C6_PFDA		93	50-150		101	50-150
13C7_PFUdA		96	50-150		90	50-150
13C8_PFOA		95	50-150		116	50-150
13C8_PFOS		95	50-150	M-03	96	50-150
13C9_PFNA	M-03	92	50-150		102	50-150
d5-EtFOSAA		89	50-150		100	50-150
d3-MeFOSAA		93	50-150		96	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-001**

Description: **LHAAP-04WW08-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1305** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1537	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2314	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		104	50-150		93	50-150
13C2_8:2FTS		90	50-150		83	50-150
13C2_PFDoA		89	50-150		98	50-150
13C2_PFTeDA		92	50-150		101	50-150
13C3_PFBS		94	50-150		114	50-150
13C3_PFHxS		99	50-150		115	50-150
13C4_PFBA		88	50-150		101	50-150
13C4_PFHpA		95	50-150		137	50-150
13C5_PFHxA		97	50-150		121	50-150
13C5_PFPeA		96	50-150		113	50-150
13C6_PFDA		93	50-150		101	50-150
13C7_PFUdA		96	50-150		90	50-150
13C8_PFOA		95	50-150		116	50-150
13C8_PFOS		95	50-150	M-03	96	50-150
13C9_PFNA	M-03	92	50-150		102	50-150
d5-EtFOSAA		89	50-150		100	50-150
d3-MeFOSAA		93	50-150		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-002**

Description: **LHAAP-FWDF-DEB-3-010623** Matrix: **Aqueous**

Date Sampled: **01/06/2023 0830** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1548	BWS	01/10/2023 1044	64455

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UM-03	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	ULS	3.6	1.8	0.91	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		99	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		116	50-150
13C2_PFTeDA		109	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		99	50-150
13C4_PFBA		63	50-150
13C4_PFHpA		92	50-150
13C5_PFHxA		92	50-150
13C5_PFPeA		85	50-150
13C6_PFDA	M-03	99	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		91	50-150
13C8_PFOS		95	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		125	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-003**

Description: **LHAAP-BG3-DEB-4-010623** Matrix: **Aqueous**

Date Sampled: **01/06/2023 0905** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1610	BWS	01/10/2023 1044	64455

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	UM-03	3.6	1.8	0.89	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.3**	**M-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	UQL	UJ	3.6	1.8	0.89	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**1.9**	**JM-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**13**	**M-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.89	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**18**	**M-03**	**3.6**	1.8	**0.89**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	173	50-150
13C2_8:2FTS		117	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		82	50-150
13C3_PFHxS		95	50-150
13C4_PFBA	N	35	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		60	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		85	50-150
13C8_PFOS		104	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		111	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-004**

Description: **LHAAP-PA3-DEB-5-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1425** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1621	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	5	01/17/2023 1632	BWS	01/10/2023 1044	64455
3	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2324	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	UM-03	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**710**	**EL**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	UM-03	3.9	2.0	0.96	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**200**		**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**550**	**E**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.4**	**JM-03**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**	**M-03**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**730**	**E**	**3.9**	2.0	**0.96**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.96	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	UM-03	3.9	2.0	0.96	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_6:2FTS		101	50-150		97	50-150		112	50-150
13C2_8:2FTS		116	50-150		103	50-150		109	50-150
13C2_PFDoA		112	50-150		100	50-150		130	50-150
13C2_PFTeDA		109	50-150		89	50-150		122	50-150
13C3_PFBS		99	50-150		89	50-150		120	50-150
13C3_PFHxS		98	50-150		95	50-150		117	50-150
13C4_PFBA		64	50-150		89	50-150		91	50-150
13C4_PFHpA		91	50-150		98	50-150		118	50-150
13C5_PFHxA		87	50-150		98	50-150		111	50-150
13C5_PFPeA		84	50-150		93	50-150		109	50-150
13C6_PFDA		104	50-150		94	50-150		122	50-150
13C7_PFUdA		106	50-150		95	50-150		112	50-150
13C8_PFOA		97	50-150		94	50-150		127	50-150
13C8_PFOS		100	50-150		96	50-150		136	50-150
13C9_PFNA		96	50-150		93	50-150		110	50-150
d5-EtFOSAA		114	50-150		98	50-150		131	50-150
d3-MeFOSAA		128	50-150		104	50-150		146	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-004**

Description: **LHAAP-PA3-DEB-5-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1425** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1621	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	5	01/17/2023 1632	BWS	01/10/2023 1044	64455
3	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2324	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	20	U	39	20	9.6	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	20	U	39	20	9.6	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	20	U	39	20	9.6	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	20	U	39	20	9.6	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**770**	**L**	**19**	9.5	**4.8**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**200**		**19**	9.5	**4.8**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**570**	D	**19**	9.5	**4.8**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**29**		**19**	9.5	**4.8**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**780**	D	**19**	9.5	**4.8**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.5	U	19	9.5	4.8	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_6:2FTS		101	50-150		97	50-150		112	50-150
13C2_8:2FTS		116	50-150		103	50-150		109	50-150
13C2_PFDoA		112	50-150		100	50-150		130	50-150
13C2_PFTeDA		109	50-150		89	50-150		122	50-150
13C3_PFBS		99	50-150		89	50-150		120	50-150
13C3_PFHxS		98	50-150		95	50-150		117	50-150
13C4_PFBA		64	50-150		89	50-150		91	50-150
13C4_PFHpA		91	50-150		98	50-150		118	50-150
13C5_PFHxA		87	50-150		98	50-150		111	50-150
13C5_PFPeA		84	50-150		93	50-150		109	50-150
13C6_PFDA		104	50-150		94	50-150		122	50-150
13C7_PFUdA		106	50-150		95	50-150		112	50-150
13C8_PFOA		97	50-150		94	50-150		127	50-150
13C8_PFOS		100	50-150		96	50-150		136	50-150
13C9_PFNA		96	50-150		93	50-150		110	50-150
d5-EtFOSAA		114	50-150		98	50-150		131	50-150
d3-MeFOSAA		128	50-150		104	50-150		146	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-004**

Description: **LHAAP-PA3-DEB-5-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1425** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1621	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	5	01/17/2023 1632	BWS	01/10/2023 1044	64455
3	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2324	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**86**		**3.8**	1.9	**0.95**	**ng/L**	**3**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**89**		**3.8**	1.9	**0.95**	**ng/L**	**3**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**74**		**3.8**	1.9	**0.95**	**ng/L**	**3**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**2.2**	**JM-03**	**3.8**	1.9	**0.95**	**ng/L**	**3**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**26**		**3.8**	1.9	**0.95**	**ng/L**	**3**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**72**		**3.8**	1.9	**0.95**	**ng/L**	**3**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	3

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_6:2FTS		101	50-150		97	50-150		112	50-150
13C2_8:2FTS		116	50-150		103	50-150		109	50-150
13C2_PFDoA		112	50-150		100	50-150		130	50-150
13C2_PFTeDA		109	50-150		89	50-150		122	50-150
13C3_PFBS		99	50-150		89	50-150		120	50-150
13C3_PFHxS		98	50-150		95	50-150		117	50-150
13C4_PFBA		64	50-150		89	50-150		91	50-150
13C4_PFHpA		91	50-150		98	50-150		118	50-150
13C5_PFHxA		87	50-150		98	50-150		111	50-150
13C5_PFPeA		84	50-150		93	50-150		109	50-150
13C6_PFDA		104	50-150		94	50-150		122	50-150
13C7_PFUdA		106	50-150		95	50-150		112	50-150
13C8_PFOA		97	50-150		94	50-150		127	50-150
13C8_PFOS		100	50-150		96	50-150		136	50-150
13C9_PFNA		96	50-150		93	50-150		110	50-150
d5-EtFOSAA		114	50-150		98	50-150		131	50-150
d3-MeFOSAA		128	50-150		104	50-150		146	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-005**

Description: **LHAAP-PWTP-DEB-6-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1335** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1632	BWS	01/10/2023 1044	64455

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	5.5	U	UJ 11	5.5	2.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	**27619-97-2**	**PFAS by ID SOP**	**5.9**	**JQM-03**	JM- **11**	5.5	**2.7**	**ng/L**	**1**
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	5.5	U	UJ 11	5.5	2.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	5.5	U	11	5.5	2.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.7	U	5.4	2.7	1.4	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.7	U	5.4	2.7	1.4	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**130**	**QLM-03**	MJ+ **5.4**	2.7	**1.4**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.7	UM-03	UJ 5.4	2.7	1.4	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.7	U	UJ 5.4	2.7	1.4	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**12**		J- **5.4**	2.7	**1.4**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**28**		J- **5.4**	2.7	**1.4**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.9**	**JM-03**	JM- **5.4**	2.7	**1.4**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**4.9**	**JM-03**	JM- **5.4**	2.7	**1.4**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**46**		J- **5.4**	2.7	**1.4**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.7	UM-03	UJ 5.4	2.7	1.4	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.7	UM-03	5.4	2.7	1.4	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.7	UM-03	5.4	2.7	1.4	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**2.9**	**JM-03**	JM- **5.4**	2.7	**1.4**	**ng/L**	**1**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	207	50-150
13C2_8:2FTS		149	50-150
13C2_PFDoA		72	50-150
13C2_PFTeDA	M-03	66	50-150
13C3_PFBS		61	50-150
13C3_PFHxS		68	50-150
13C4_PFBA	N	46	50-150
13C4_PFHpA		63	50-150
13C5_PFHxA		59	50-150
13C5_PFPeA		52	50-150
13C6_PFDA	M-03	78	50-150
13C7_PFUdA		80	50-150
13C8_PFOA		70	50-150
13C8_PFOS		72	50-150
13C9_PFNA	M-03	74	50-150
d5-EtFOSAA		80	50-150
d3-MeFOSAA		88	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-006**

Description: **LHAAP-PA2-DEB-7-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1510** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1654	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2335	ARC2	01/20/2023 1156	65403
3	SOP SPE	PFAS by ID SOP QSM B-15	5	01/24/2023 1447	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	UM-03	8.0	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	8.0	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**3.9**	**JLM-03**	**4.0**	2.0	**1.0**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	2.0	UM-03	4.0	2.0	1.0	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	2.0	UM-03	4.0	2.0	1.0	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	UM-03	4.0	2.0	1.0	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	2.0	UM-03	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_6:2FTS	M-03	105	50-150		116	50-150		98	50-150
13C2_8:2FTS		125	50-150		123	50-150		87	50-150
13C2_PFDoA		99	50-150		109	50-150		104	50-150
13C2_PFTeDA		91	50-150		111	50-150		98	50-150
13C3_PFBS		103	50-150		122	50-150		112	50-150
13C3_PFHxS		99	50-150		109	50-150		109	50-150
13C4_PFBA		72	50-150		69	50-150		101	50-150
13C4_PFHpA		92	50-150		113	50-150		115	50-150
13C5_PFHxA		96	50-150		113	50-150		111	50-150
13C5_PFPeA		98	50-150		118	50-150		100	50-150
13C6_PFDA		108	50-150		115	50-150		114	50-150
13C7_PFUdA	M-03	102	50-150		109	50-150		95	50-150
13C8_PFOA		98	50-150		133	50-150	M-03	99	50-150
13C8_PFOS	M-03	97	50-150		118	50-150		105	50-150
13C9_PFNA		94	50-150		110	50-150		120	50-150
d5-EtFOSAA		101	50-150		110	50-150		88	50-150
d3-MeFOSAA		106	50-150		114	50-150		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-006**

Description: **LHAAP-PA2-DEB-7-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1510** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1654	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2335	ARC2	01/20/2023 1156	65403
3	SOP SPE	PFAS by ID SOP QSM B-15	5	01/24/2023 1447	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.1	U	8.1	4.1	2.0	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**800**	**E**	**4.0**	2.0	**1.0**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**17**	**M-03**	**4.0**	2.0	**1.0**	**ng/L**	**2**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**42**	**M-03**	**4.0**	2.0	**1.0**	**ng/L**	**2**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.0**	**JM-03**	**4.0**	2.0	**1.0**	**ng/L**	**2**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**3.8**	**J**	**4.0**	2.0	**1.0**	**ng/L**	**2**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**130**	**M-03**	**4.0**	2.0	**1.0**	**ng/L**	**2**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	2.0	U	4.0	2.0	1.0	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_6:2FTS	M-03	105	50-150		116	50-150		98	50-150
13C2_8:2FTS		125	50-150		123	50-150		87	50-150
13C2_PFDoA		99	50-150		109	50-150		104	50-150
13C2_PFTeDA		91	50-150		111	50-150		98	50-150
13C3_PFBS		103	50-150		122	50-150		112	50-150
13C3_PFHxS		99	50-150		109	50-150		109	50-150
13C4_PFBA		72	50-150		69	50-150		101	50-150
13C4_PFHpA		92	50-150		113	50-150		115	50-150
13C5_PFHxA		96	50-150		113	50-150		111	50-150
13C5_PFPeA		98	50-150		118	50-150		100	50-150
13C6_PFDA		108	50-150		115	50-150		114	50-150
13C7_PFUdA	M-03	102	50-150		109	50-150		95	50-150
13C8_PFOA		98	50-150		133	50-150	M-03	99	50-150
13C8_PFOS	M-03	97	50-150		118	50-150		105	50-150
13C9_PFNA		94	50-150		110	50-150		120	50-150
d5-EtFOSAA		101	50-150		110	50-150		88	50-150
d3-MeFOSAA		106	50-150		114	50-150		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-006**

Description: **LHAAP-PA2-DEB-7-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1510** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1654	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2335	ARC2	01/20/2023 1156	65403
3	SOP SPE	PFAS by ID SOP QSM B-15	5	01/24/2023 1447	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	20	U	40	20	10	ng/L	3
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	20	U	40	20	10	ng/L	3
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	20	U	40	20	10	ng/L	3
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	20	U	40	20	10	ng/L	3
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**810**	**D**	**20**	10	**5.1**	**ng/L**	**3**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**15**	**J**	**20**	10	**5.1**	**ng/L**	**3**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**36**	**M-03**	**20**	10	**5.1**	**ng/L**	**3**
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	10	UM-03	20	10	5.1	ng/L	3
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**140**		**20**	10	**5.1**	**ng/L**	**3**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	10	U	20	10	5.1	ng/L	3

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_6:2FTS	M-03	105	50-150		116	50-150		98	50-150
13C2_8:2FTS		125	50-150		123	50-150		87	50-150
13C2_PFDoA		99	50-150		109	50-150		104	50-150
13C2_PFTeDA		91	50-150		111	50-150		98	50-150
13C3_PFBS		103	50-150		122	50-150		112	50-150
13C3_PFHxS		99	50-150		109	50-150		109	50-150
13C4_PFBA		72	50-150		69	50-150		101	50-150
13C4_PFHpA		92	50-150		113	50-150		115	50-150
13C5_PFHxA		96	50-150		113	50-150		111	50-150
13C5_PFPeA		98	50-150		118	50-150		100	50-150
13C6_PFDA		108	50-150		115	50-150		114	50-150
13C7_PFUdA	M-03	102	50-150		109	50-150		95	50-150
13C8_PFOA		98	50-150		133	50-150	M-03	99	50-150
13C8_PFOS	M-03	97	50-150		118	50-150		105	50-150
13C9_PFNA		94	50-150		110	50-150		120	50-150
d5-EtFOSAA		101	50-150		110	50-150		88	50-150
d3-MeFOSAA		106	50-150		114	50-150		96	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-007**

Description: **LHAAP-EB-7-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1320** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1705	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2345	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.9**	**JLM-03**	**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		106	50-150		117	50-150
13C2_8:2FTS		103	50-150		89	50-150
13C2_PFDoA		95	50-150		103	50-150
13C2_PFTeDA		95	50-150		113	50-150
13C3_PFBS		101	50-150		120	50-150
13C3_PFHxS		99	50-150		135	50-150
13C4_PFBA		89	50-150		101	50-150
13C4_PFHpA		94	50-150		119	50-150
13C5_PFHxA		95	50-150		115	50-150
13C5_PFPeA		101	50-150		121	50-150
13C6_PFDA	M-03	102	50-150	M-03	123	50-150
13C7_PFUdA	M-03	97	50-150		107	50-150
13C8_PFOA		99	50-150		127	50-150
13C8_PFOS		99	50-150		113	50-150
13C9_PFNA		93	50-150		112	50-150
d5-EtFOSAA		93	50-150		97	50-150
d3-MeFOSAA		102	50-150		111	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-007**

Description: **LHAAP-EB-7-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1320** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1705	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2345	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		106	50-150		117	50-150
13C2_8:2FTS		103	50-150		89	50-150
13C2_PFDoA		95	50-150		103	50-150
13C2_PFTeDA		95	50-150		113	50-150
13C3_PFBS		101	50-150		120	50-150
13C3_PFHxS		99	50-150		135	50-150
13C4_PFBA		89	50-150		101	50-150
13C4_PFHpA		94	50-150		119	50-150
13C5_PFHxA		95	50-150		115	50-150
13C5_PFPeA		101	50-150		121	50-150
13C6_PFDA	M-03	102	50-150	M-03	123	50-150
13C7_PFUdA	M-03	97	50-150		107	50-150
13C8_PFOA		99	50-150		127	50-150
13C8_PFOS		99	50-150		113	50-150
13C9_PFNA		93	50-150		112	50-150
d5-EtFOSAA		93	50-150		97	50-150
d3-MeFOSAA		102	50-150		111	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-008**

Description: **LHAAP-FB-6-010523** Matrix: **Aqueous**

Date Sampled: **01/05/2023 1325** Project Name: **LHAAP PFAS**

Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1738	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2356	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UM-03	7.4	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**2.6**	**JL**	**3.7**	1.9	**0.92**	**ng/L**	**1**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.92	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		101	50-150	M-03	123	50-150
13C2_8:2FTS		99	50-150		96	50-150
13C2_PFDoA		85	50-150		109	50-150
13C2_PFTeDA		76	50-150		123	50-150
13C3_PFBS		95	50-150		128	50-150
13C3_PFHxS		97	50-150		134	50-150
13C4_PFBA		93	50-150		117	50-150
13C4_PFHpA		91	50-150		122	50-150
13C5_PFHxA		93	50-150		116	50-150
13C5_PFPeA		93	50-150		122	50-150
13C6_PFDA	M-03	96	50-150		116	50-150
13C7_PFUdA		89	50-150		105	50-150
13C8_PFOA		97	50-150		140	50-150
13C8_PFOS		90	50-150		121	50-150
13C9_PFNA		90	50-150		117	50-150
d5-EtFOSAA		87	50-150		114	50-150
d3-MeFOSAA		97	50-150		116	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Arcadis U.S., Inc.** Laboratory ID: **YA09008-008**
Description: **LHAAP-FB-6-010523** Matrix: **Aqueous**
Date Sampled: **01/05/2023 1325** Project Name: **LHAAP PFAS**
Date Received: **01/09/2023** Project Number: **30001997.40013**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	01/16/2023 1738	BWS	01/10/2023 1044	64455
2	SOP SPE	PFAS by ID SOP QSM B-15	1	01/23/2023 2356	ARC2	01/20/2023 1156	65403

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.4	3.7	1.9	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		101	50-150	M-03	123	50-150
13C2_8:2FTS		99	50-150		96	50-150
13C2_PFDoA		85	50-150		109	50-150
13C2_PFTeDA		76	50-150		123	50-150
13C3_PFBS		95	50-150		128	50-150
13C3_PFHxS		97	50-150		134	50-150
13C4_PFBA		93	50-150		117	50-150
13C4_PFHpA		91	50-150		122	50-150
13C5_PFHxA		93	50-150		116	50-150
13C5_PFPeA		93	50-150		122	50-150
13C6_PFDA	M-03	96	50-150		116	50-150
13C7_PFUdA		89	50-150		105	50-150
13C8_PFOA		97	50-150		140	50-150
13C8_PFOS		90	50-150		121	50-150
13C9_PFNA		90	50-150		117	50-150
d5-EtFOSAA		87	50-150		114	50-150
d3-MeFOSAA		97	50-150		116	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS) Analysis

SDG # XK11065

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

Report # 47957R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # XK11065 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-FWDF-SO-02-110922	XK11065-001	Soil	11/9/2022		X		
LHAAP-PA3-SO-02-110922	XK11065-002	Soil	11/9/2022		X		
LHAAP-PA3-SO-12-110922	XK11065-003	Soil	11/9/2022		X		
LHAAP-PA3-SO-06-110922	XK11065-004	Soil	11/9/2022		X		
LHAAP-PA3-SO-01-110922	XK11065-005	Soil	11/9/2022		X		
LHAAP-PA3-SO-03-110922	XK11065-006	Soil	11/9/2022		X		
LHAAP-PA3-SO-11-110922	XK11065-007	Soil	11/9/2022		X		
LHAAP-PA3-SO-04-110922	XK11065-008	Soil	11/9/2022		X		
LHAAP-FWDF-SO-03-110922	XK11065-009	Soil	11/9/2022		X		
LHAAP-PA3-SO-05-110922	XK11065-010	Soil	11/9/2022		X		
LHAAP-FD-2-SO-110922	XK11065-012	Soil	11/9/2022	LHAAP-PA3-SO-09-110822	X		
LHAAP-PA3-SO-09-110822	XK11065-013	Soil	11/8/2022		X		
LHAAP-PA3-SO-08-110822	XK11065-014	Soil	11/8/2022		X		
LHAAP-VWR-SO-02-110822	XK11065-015	Soil	11/8/2022		X		
LHAAP-FD-1-SO-110822	XK11065-016	Soil	11/8/2022	LHAAP-VWR-SO-02-110822	X		
LHAAP-PA3-SO-10-110822	XK11065-017	Soil	11/8/2022		X		
LHAAP-VWR-SO-01-110822	XK11065-018	Soil	11/8/2022		X		
LHAAP-ONFS-SO-05-110822	XK11065-019	Soil	11/8/2022		X		
LHAAP-ONFS-SO-06-110822	XK11065-020	Soil	11/8/2022		X		

Notes:

1. Stage 4 validation was performed on sample locations LHAAP-PA3-SO-04-110922 and LHAAP-ONFS-SO-06-110822.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample locations LHAAP-PA3-SO-01-110922 and LHAAP-VWR-SO-02-110822.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

1. The sample ID LHAAP-PA3-SO-01-110922 listed twice on chain of custody as XK11065-005 and XK11065-011. Hence, the laboratory reported results for XK11065-005.

2. As per project team communication the following sample IDs LHAAP-PA3-DUP01 (XK11065-012), LHAAP-VWR-DUP01 (XK11065-016) are corrected as LHAAP-FD-2-SO-110922 and LHAAP-FD-1-SO-110822 respectively.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard must be within 70-130% of their true value.

The initial calibration, and initial calibration verification standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the initial and continuing calibrations were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

All EIS recoveries were within control limits.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample locations LHAAP-PA3-SO-01-110922 and LHAAP-VWR-SO-02-110822 exhibited recoveries and RPD between recoveries within the control limits.

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three time the LOQ for soil matrices.

Results for field duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compounds	Sample Result	Duplicate Result	RPD
LHAAP-PA3-SO-09-110822 / LHAAP-FD-2-SO-110922	All target compounds	U	U	AC
LHAAP-VWR-SO-02-110822 / LHAAP-FD-1-SO-110822	All target compounds	U	U	AC

Note:
AC Acceptable

The results between the parent samples and their associated field duplicate were acceptable.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to "M" and preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate(MSD) %R		X		X	
MS/MSD Precision (RPD)		X		X	
Field Duplicate (RPD)		X		X	
Extracted Internal Standard %R		X		X	
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

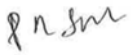
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Suresh PR, Arcadis

SIGNATURE: 

DATE: December 19, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: December 20, 2022

Stage 3 / 4
PFAS Calibration Standards

SDG #: XK11065 Date: 12/19/2022
Lab: Pace (Shealy) Page: 1
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3
Instrument : LCMSMS01
PFOA 11/8/2022 Calibration Pg 481-491 of SDG XK11065

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
100	72797	1296931	2000	0.05613	1.12260	0.973574	115.31	100	115.31	115.3	MATCH
200	115171	1337797	2000	0.08609	0.86090	0.973574	176.85	200	88.43	88.4	MATCH
500	350883	1415484	2000	0.247889	0.99156	0.973574	509.24	500	101.85	101.8	MATCH
1000	646894	1428498	2000	0.452849	0.90570	0.973574	930.28	1000	93.03	93	MATCH
2000	1403688	1392452	2000	1.008069	1.00807	0.973574	2070.86	2000	103.54	103.5	MATCH
5000	3136037	1297966	2000	2.416116	0.96645	0.973574	4963.40	5000	99.27	99.3	MATCH
10000	6122574	1121189	2000	5.460787	1.09216	0.973574	11218.02	10000	112.18	112.2	MATCH
15000	9418743	1388280	2000	6.784469	0.90460	0.973574	13937.24	15000	92.91	92.9	MATCH
20000	12470208	1370140	2000	9.101412	0.91014	0.973574	18696.91	20000	93.48	93.5	MATCH
				Avg RF	0.9735743	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XK11065 Date: 12/19/2022
Lab: Pace (Shealy) Page: 2
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS01 File ID: 110822B018
ICV_1000_SVLC-2193 11/8/2022 18:44:56 Page 691 of SDG XK11065

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFOA	776.65	1000	77.67	77.7	MATCH
PFNA	947.86	1000	94.79	94.8	MATCH
PFDA	888.82	1000	88.88	88.9	MATCH
PFDoA	800.32	1000	80.03	80	MATCH

Instrument: LCMSMS01 File ID: 111722005.d
CCV 200_SVLC-2261 11/17/2022 13:40:38 Page 1199 of SDG XK11065
This CCV applicable for sample XK11065-008

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFOA	197.08	200	98.54	98.5	MATCH
PFNA	233.32	200	116.66	116.7	MATCH
PFDA	188.4	200	94.20	94.2	MATCH
PFDoA	203.48	200	101.74	101.7	MATCH

Instrument: LCMSMS01 File ID: 111822005.d
CCV 200_SVLC-2261 11/18/2022 13:55:36 Page 1291 of SDG XK11065
This CCV applicable for sample XK11065-020

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFOA	171.13	200	85.57	85.6	MATCH
PFNA	187.57	200	93.79	93.8	MATCH
PFDA	208.55	200	104.28	104.3	MATCH
PFDoA	201	200	100.50	100.5	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XK11065 Date: 12/19/2022
Lab: Pace (Shealy) Page: 3
Project: LHAAP PFAS PA/SI Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS01 File ID: 111722009.d
LCS XQ60329-002 Pg 1829 of SDG XK11065
Final volume = 5 mls; Weight = 1.00 gm; TS = 100%
This LCS applicable for sample XK11065-008

Analyte	Std Area	EIS Area	EIS Conc	Area Ratio	RF	Calculated Conc ng/L	Conc ug/Kg	Final Conc mg/kg	True Conc mg/kg	Calculated Percent Recovery	Reported Percent Recovery	
PFOA	273462	1464174	2000	0.186769	0.973574	383.68	1.918383	0.00192	0.0020	95.9	96	MATCH
PFNA	252251	1411666	2000	0.17869	0.891482	400.88	2.004418	0.00200	0.0020	100.2	100	MATCH
PFDA	230207	1259105	2000	0.182834	0.965716	378.65	1.893246	0.00189	0.0020	94.7	95	MATCH
PFDoA	210492	1151031	2000	0.182873	0.965239	378.92	1.894583	0.00189	0.0020	94.7	95	MATCH

Instrument: LCMSMS01 File ID: 111822028.d
LCS XQ60330-002 Pg 1860 of SDG XK11065
Final volume = 5 mls; Weight = 1.00 gm; TS = 100%
This LCS applicable for sample XK11065-020

Analyte	Std Area	EIS Area	EIS Conc	Area Ratio	RF	Calculated Conc ng/L	Conc ug/Kg	Final Conc mg/kg	True Conc mg/kg	Calculated Percent Recovery	Reported Percent Recovery	
PFOA	291441	1520521	2000	0.191672	0.973574	393.75	1.968744	0.00197	0.0020	98.4	98	MATCH
PFNA	249466	1465716	2000	0.170201	0.891482	381.84	1.909189	0.00191	0.0020	95.5	95	MATCH
PFDA	218614	1337229	2000	0.163483	0.965716	338.57	1.692867	0.00169	0.0020	84.6	85	MATCH
PFDoA	221870	1185398	2000	0.187169	0.965239	387.82	1.939097	0.00194	0.0020	97.0	97	MATCH

Calculated Conc ng/L = ((Area Ratio x EIS Conc)/RF)
Conc ug/ kg = Calculated Conc * Dilution Factor * (Final Volume Liters / Initial weight gms)
Final Conc mg/kg = (ug/kg / 1000)
Percent Recovery = (Final Conc / True Value)*100
Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS MS/MSD

SDG #:	XK11065	Date:	12/19/2022
Lab:	Pace (Shealy)	Page:	4
Project:	LHAAP PFAS PA/SI	Validated by:	SPR

Method: EPA modified 537 per DoD QSM 5.3

MS/MSD Sample ID	LHAAP-VWR-SO-02-110822
Lab Sample ID	XK11065-015
ANALYTE	PFDA
REPORTED MS %R	126
REPORTED MSD %R	115
REPORTED RPD	6.7

Page 1937 and 1987 SDG XK11065

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}} \qquad RPD = \frac{100 * |\text{MS \%R} - \text{MSD \%R}|}{\text{Average of MS MSD \%R}}$$

Sample Concentration	0			
MS Concentration	0.0025	MS %R	125.7	MATCH
MSD Concentration	0.0024	MSD %R	117.5	MATCH
MS TV	0.002	RPD	6.74	MATCH
MSD TV	0.002			

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XK11065
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/19/2022
Page: 5
Validated by: SPR

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-PA3-SO-04-110922 Lab ID: XK11065-008 Page 155 of SDG XK11065
Final volume = 5ml; Weight = 1.08 gm; %Solids = 90.0%

Analyte	Std Area	EIS Area	EIS Conc	Area Ratio	RF	Calculated Conc ug/Kg	Dry Weight Conc ug/Kg	Final Conc mg/kg	Reported Conc mg/kg	
PFOA	224719	1647380	2000	0.13641	0.973574	1.2973	1.4415	0.0014	0.0014	MATCH

Field Sample: LHAAP-ONFS-SO-06-110822 Lab ID: XK11065-020 Page 256 of SDG XK11065
Final volume = 5ml; Weight = 1.13 gm; %Solids = 86.0%

Analyte	Std Area	EIS Area	EIS Conc	Area Ratio	RF	Calculated Conc ug/Kg	Dry Weight Conc ug/Kg	Final Conc mg/kg	Reported Conc mg/kg	
PFDA	63066	1174833	2000	0.053681	0.965716	0.4919	0.5720	0.00057	0.00057 J	MATCH
PFNA	252706	1353078	2000	0.186764	0.891482	1.8540	2.1558	0.0022	0.0022	MATCH
PFDoA	127451	1192681	2000	0.106861	0.965239	0.9797	1.1392	0.0011	0.0011	MATCH

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
ug/kg = [(ng/L x FV L)/ Weight g]
ug/kg dry weight = ug/kg / (%TS/100)
mg/kg = (ug/kg / 1000)

Stage 3 / 4
PFAS EIS

SDG #:	XK11065	Date:	12/19/2022
Lab:	Pace (Shealy)	Page:	6
Project:	LHAAP PFAS PA/SI	Validated by:	SPR

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-ONFS-SO-06-110822 Lab ID: XK11065-020

EIS 13C9_PFNA
REPORTED EIS %R 91

$$\%R = \frac{100 * \text{EIS Area}}{\text{CCV 200 EIS Area}}$$

EIS Area	1353078	Page 258 of SDG XK11065
CCV 200 EIS Area	1486530	Page 1294 of SDG XK11065
%R	91.0	MATCH

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Pace Analytical®

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 140836

Client: United States Army Corps of Engineers	Report to Contact: Dana Slamicki	Telephone No. / E-mail: (607)346-1272 Dana.Slamicki@usace.army.mil
Address: Elmore, OH.	Sampler's Signature: x Lindsey M. DeRamus	Quote No.
City: Karnack / State: TX / Zip Code: 75661	Printed Name:	Page 1 of 2
Project Name: LHAAP		XK11065
Project No.: 30001997	P.O. No.	

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab / Composite	Matrix: Aqueous	Matrix: Solid / Non-Aqueous	No of Containers by Preservative Type: Unpres.	Hcl	HNO3	H2SO4	NaOH	NaHSO4	Na2S2O3	Other	PFAS-QSM	Remarks / Cooler I.D.
LHAAP-FWDF-SO-02	11/09/22	14:45	C		X	X								X	
LHAAP-PA3-SO-02	11/09/22	09:40													
LHAAP-PA3-SO-12	11/09/22	0830													
LHAAP-PA3-SO-06	11/09/22	11:45													
LHAAP-PA3-SO-01	11/09/22	09:00													MS/MSD
LHAAP-PA3-SO-03	11/09/22	10:15													
LHAAP-PA3-SO-11	11/09/22	13:45													
LHAAP-PA3-SO-04	11/09/22	14:10													
LHAAP-FWDF-SO-03	11/09/22	15:05													
LHAAP-PA3-SO-05	11/09/22	11:20	↓	↓	↓	↓								↓	

Turn Around Time Required (Prior lab approval required for expedited TAT): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by: Lindsey M. DeRamus	11/10/22	0752
2. Relinquished by	Date	Time
3. Relinquished by	Date	Time
4. Relinquished by: Elbert	11/10/22	1415

	Date	Time
1. Received by		
2. Received by		
3. Received by		
4. Laboratory received by: Carly Rutter	11/10/22	1415

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle): Yes / No Ice Pack: Receipt Temp: 1.4/1.5 °C
Temp Blank: Y / N
LOG IN: 11/11/22

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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Number 140837

Client: United States Army Corps of Engineers	Report to Contact: Dana Schmidt	Telephone No. / E-mail: (817) 314-1272 dana.schmidt@arcadis.com	Quote No.
Address: Zenaimer, OR	Sampler's Signature: xwyndsey m. DeRamus	Analysis (Attach list if more space is needed)	Page 2 of 2
City: Kennack / State: TX / Zip Code: 75161	Printed Name:	PFAS-ISM	XK11065
Project Name: LHAAP			KES2
Project No.: 30001997	P.O. No.		

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab / Composite	Matrix: Aqueous / Soil / Wipe / Air / Tissue	No. of Containers by Preservative Type: Unpres. / HNO3 / HCl / NaOH / H2SO4 / Na2S2O3 / Field Filtered	PFAS-ISM	Remarks / Cooler I.D.
LHAAP-PA3-SO-01	11/09/22	09:00	C	X	X	X	grainsize, TOC, PSI, BDP
LHAAP-PA3-DUP01	11/09/22	—					DUPLICATE
LHAAP-PA3-SO-09	11/08/22	12:00					
LHAAP-PA3-SO-08	11/08/22	13:10					
LHAAP-VWR-SO-02	11/08/22	09:45					MS, MSD
LHAAP-VWR-DUP01	11/08/22	—					DUPLICATE
LHAAP-PA3-SO-10	11/08/22	13:40					
LHAAP-VWR-SO-01	11/08/22	10:50					
LHAAP-ONFS-SO-05	11/08/22	09:45					
LHAAP-ONFS-SO-06	11/08/22	08:55					

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☑ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☑ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☑ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by: xwyndsey m. DeRamus	11/10/22	09:05	1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	Date 11/11/22	Time 1415	4. Laboratory received by: Carley Reuter	Date 11/11/22	Time 1415

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY — Received on ice (Circle) (Yes) No — Ice Pack — Receipt Temp: 4.5 °C 4.4 °C — Temp Blank: (Y) N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Document Number: ME003N2-01

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-001	
Description: LHAAP-FWDF-SO-02-110922		Matrix: Solid	
Date Sampled: 11/09/2022 1445	Project Name: LHAAP	% Solids: 79.5	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/15/2022 2336	ALM	11/14/2022 2137	60079

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00061	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00061	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00061	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00061	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	M-03	101	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		107	50-150
13C2_PFTeDA	M-03	108	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		83	50-150
13C4_PFBA		70	50-150
13C4_PFHpA		74	50-150
13C5_PFHxA		70	50-150
13C5_PFPeA		72	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		77	50-150
13C8_PFOS		86	50-150
13C9_PFNA		73	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		94	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-002	
Description: LHAAP-PA3-SO-02-110922		Matrix: Solid	
Date Sampled: 11/09/2022 0940	Project Name: LHAAP	% Solids: 91.2	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
2	SOP SPE	PFAS by ID SOP QSM B-15	1	11/22/2022 1743	ALM	11/21/2022 1953	60728

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	JM-03 JM	0.0019	0.00095	0.00048	mg/Kg	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	2

Surrogate	Q	Run 2 % Recovery	Acceptance Limits
13C2_6:2FTS		102	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		107	50-150
13C2_PFTeDA		107	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		98	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		108	50-150
13C8_PFOS		115	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-003	
Description: LHAAP-PA3-SO-12-110922		Matrix: Solid	
Date Sampled: 11/09/2022 0830	Project Name: LHAAP	% Solids: 79.7	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/16/2022 0021	ALM	11/14/2022 2137	60079

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		94	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		83	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		86	50-150
13C5_PFHxA		78	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		86	50-150
13C8_PFOS		83	50-150
13C9_PFNA		78	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		91	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK11065-004
Description: LHAAP-PA3-SO-06-110922
Matrix: Solid
Date Sampled: 11/09/2022 1145
Project Name: LHAAP
% Solids: 88.9 11/19/2022 0230
Date Received: 11/11/2022
Project Number: 30001997

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1712	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00048	U	0.00095	0.00048	0.00019	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00048	UM-03 U	0.00095	0.00048	0.00019	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		97	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		104	50-150
13C3_PFBS		108	50-150
13C3_PFHxS		90	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		85	50-150
13C8_PFOS	M-03	101	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-005	
Description: LHAAP-PA3-SO-01-110922		Matrix: Solid	
Date Sampled: 11/09/2022 0900	Project Name: LHAAP	% Solids: 83.1	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/22/2022 1754	ALM	11/21/2022 1953	60728

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		118	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		116	50-150
13C2_PFTeDA		114	50-150
13C3_PFBS		112	50-150
13C3_PFHxS		110	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		93	50-150
13C5_PFHxA		112	50-150
13C5_PFPeA		108	50-150
13C6_PFDA		114	50-150
13C7_PFUdA		111	50-150
13C8_PFOA		107	50-150
13C8_PFOS		111	50-150
13C9_PFNA		112	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK11065-006
Description: LHAAP-PA3-SO-03-110922
Matrix: Solid
Date Sampled: 11/09/2022 1015
Project Name: LHAAP
% Solids: 84.0 11/19/2022 0230
Date Received: 11/11/2022
Project Number: 30001997

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1722	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	UM-03 U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		82	50-150
13C2_8:2FTS		82	50-150
13C2_PFDoA		87	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		92	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		83	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		90	50-150
13C8_PFOS		90	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		83	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-007	
Description: LHAAP-PA3-SO-11-110922		Matrix: Solid	
Date Sampled: 11/09/2022 1345	Project Name: LHAAP	% Solids: 85.6	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1733	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		68	50-150
13C2_8:2FTS		65	50-150
13C2_PFDoA		71	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		69	50-150
13C3_PFHxS		63	50-150
13C4_PFBA		76	50-150
13C4_PFHpA		71	50-150
13C5_PFHxA		69	50-150
13C5_PFPeA		71	50-150
13C6_PFDA		65	50-150
13C7_PFUdA		72	50-150
13C8_PFOA		77	50-150
13C8_PFOS		81	50-150
13C9_PFNA		66	50-150
d5-EtFOSAA		69	50-150
d3-MeFOSAA		61	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-008	
Description: LHAAP-PA3-SO-04-110922		Matrix: Solid	
Date Sampled: 11/09/2022 1410	Project Name: LHAAP	% Solids: 90.0	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1744	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	UM-03	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.0014	M-03	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		89	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		99	50-150
13C3_PFHxS		92	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		82	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		112	50-150
13C8_PFOS		97	50-150
13C9_PFNA	M-03	89	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		92	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-009	
Description: LHAAP-FWDF-SO-03-110922		Matrix: Solid	
Date Sampled: 11/09/2022 1505	Project Name: LHAAP	% Solids: 90.6	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1754	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	M-03	75	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		91	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		77	50-150
13C4_PFBA		84	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		79	50-150
13C6_PFDA		83	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		83	50-150
13C8_PFOS		85	50-150
13C9_PFNA		84	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		80	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK11065-010
Description: LHAAP-PA3-SO-05-110922
Matrix: Solid
Date Sampled: 11/09/2022 1120
Project Name: LHAAP
% Solids: 86.1 11/19/2022 0230
Date Received: 11/11/2022
Project Number: 30001997

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1805	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00054	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	UM-03 U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		94	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		108	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		102	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		88	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		93	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		111	50-150
13C8_PFOA		87	50-150
13C8_PFOS		106	50-150
13C9_PFNA		102	50-150
d5-EtFOSAA		118	50-150
d3-MeFOSAA		95	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-012	
Description: LHAAP-FD-2-SO-110922		Matrix: Solid	
Date Sampled: 11/09/2022	Project Name: LHAAP	% Solids: 83.9	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1816	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		87	50-150
13C2_8:2FTS		97	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		99	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		97	50-150
13C6_PFDA		95	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		81	50-150
13C8_PFOS		103	50-150
13C9_PFNA		93	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		96	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-013	
Description: LHAAP-PA3-SO-09-110822		Matrix: Solid	
Date Sampled: 11/08/2022 1200	Project Name: LHAAP	% Solids: 91.6	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1826	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00047	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00047	U	0.00094	0.00047	0.00019	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		86	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		97	50-150
13C3_PFHxS		95	50-150
13C4_PFBA		93	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		84	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		92	50-150
13C8_PFOS		101	50-150
13C9_PFNA		92	50-150
d5-EtFOSAA		82	50-150
d3-MeFOSAA		73	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-014	
Description: LHAAP-PA3-SO-08-110822		Matrix: Solid	
Date Sampled: 11/08/2022 1310	Project Name: LHAAP	% Solids: 78.8	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1837	BWS	11/16/2022 2133	60329

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00054	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		79	50-150
13C2_8:2FTS		91	50-150
13C2_PFDoA		85	50-150
13C2_PFTeDA		96	50-150
13C3_PFBS		86	50-150
13C3_PFHxS		88	50-150
13C4_PFBA		88	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		80	50-150
13C5_PFPeA		84	50-150
13C6_PFDA		86	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		93	50-150
13C8_PFOS		93	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		86	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-015	
Description: LHAAP-VWR-SO-02-110822		Matrix: Solid	
Date Sampled: 11/08/2022 0945	Project Name: LHAAP	% Solids: 89.3	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/22/2022 1827	ALM	11/21/2022 1953	60728

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00048	U	0.00096	0.00048	0.00019	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00048	UM-03 U	0.00096	0.00048	0.00019	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		90	50-150
13C2_8:2FTS		93	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		95	50-150
13C3_PFHxS		92	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		76	50-150
13C5_PFHxA		91	50-150
13C5_PFPeA		85	50-150
13C6_PFDA		92	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		91	50-150
13C8_PFOS		100	50-150
13C9_PFNA		97	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		84	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-016	
Description: LHAAP-FD-1-SO-110822		Matrix: Solid	
Date Sampled: 11/08/2022	Project Name: LHAAP	% Solids: 86.1	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1809	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.00099	0.00050	0.00020	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	UM-03 U	0.00099	0.00050	0.00020	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		120	50-150
13C2_PFDoA		105	50-150
13C2_PFTeDA		112	50-150
13C3_PFBS		90	50-150
13C3_PFHxS		102	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		86	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		91	50-150
13C8_PFOS		94	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-017	
Description: LHAAP-PA3-SO-10-110822		Matrix: Solid	
Date Sampled: 11/08/2022 1340	Project Name: LHAAP	% Solids: 81.3	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1820	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		89	50-150
13C2_8:2FTS		101	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		105	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		96	50-150
13C4_PFBA		94	50-150
13C4_PFHpA		101	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		88	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		96	50-150
13C8_PFOS		89	50-150
13C9_PFNA		88	50-150
d5-EtFOSAA	M-03	84	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-018	
Description: LHAAP-VWR-SO-01-110822		Matrix: Solid	
Date Sampled: 11/08/2022 1050	Project Name: LHAAP	% Solids: 90.3	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1831	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	M-03	92	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		94	50-150
13C2_PFTeDA		105	50-150
13C3_PFBS		92	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		88	50-150
13C6_PFDA		93	50-150
13C7_PFUdA		81	50-150
13C8_PFOA		127	50-150
13C8_PFOS		109	50-150
13C9_PFNA		100	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK11065-019	
Description: LHAAP-ONFS-SO-05-110822		Matrix: Solid	
Date Sampled: 11/08/2022 0915	Project Name: LHAAP	% Solids: 88.7	11/19/2022 0230
Date Received: 11/11/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1841	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	UM-03 U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	UM-03 U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		103	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		107	50-150
13C2_PFTeDA		115	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		102	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		107	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		108	50-150
13C8_PFOS		103	50-150
13C9_PFNA		101	50-150
d5-EtFOSAA		112	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK11065-020
Description: LHAAP-ONFS-SO-06-110822
Matrix: Solid
Date Sampled: 11/08/2022 0855
Project Name: LHAAP
% Solids: 86.0 11/19/2022 0230
Date Received: 11/11/2022
Project Number: 30001997

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1852	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00051	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00057	JM-03 JM	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.0011		0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	UM-03 U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.0022		0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.031		0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.096		0.0010	0.00050	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	UM-03 U	0.0010	0.00050	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		88	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		105	50-150
13C2_PFTeDA		102	50-150
13C3_PFBS		87	50-150
13C3_PFHxS		101	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		89	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		83	50-150
13C6_PFDA		91	50-150
13C7_PFUdA		94	50-150
13C8_PFOA		93	50-150
13C8_PFOS		92	50-150
13C9_PFNA		91	50-150
d5-EtFOSAA		81	50-150
d3-MeFOSAA		85	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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ARCADIS

Former Longhorn Army Ammunition Plant PFAS PA/SI

DATA REVIEW

Karnack, Texas

Perfluoroalkyl Substances (PFAS), TOC and Soil pH Analyses

SDGs # XK14005, and 222111623

Analyses Performed By:
Pace Analytical Services
West Columbia, South Carolina

And

Pace Analytical Gulf Coast
Baton Rouge, Louisiana

Report # 48069R
Review Level: Stage 3/4
Project: 30001997.40013

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Groups (SDGs) # XK14005, and 222111623 for samples collected in association with the Former Longhorn Army Ammunition Plant Site. The review was conducted as a 100% Stage 2b and 10% Stage 3/4 evaluation and included review of data package completeness. This validation report deviated from Worksheet 36 of the Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, (Arcadis, 2019). However, the recalculations of sample results and associated quality control checks confirmed lab reported results. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
					PFAS	TOC	pH
LHAAP-PA2-SO-10-111122	XK14005-001	Soil	11/11/2022		X		
LHAAP-PA2-SO-09-111122	XK14005-002	Soil	11/11/2022		X		
LHAAP-BG3-SO-01-111022	XK14005-003	Soil	11/10/2022		X		
LHAAP-PA2-SO-06-111022	XK14005-004	Soil	11/10/2022		X		
LHAAP-BG3-SO-04-111022	XK14005-005	Soil	11/10/2022		X		
LHAAP-BG3-SO-05-111022	XK14005-006	Soil	11/10/2022		X		
LHAAP-BG3-SO-02-111022	XK14005-007	Soil	11/10/2022		X		
LHAAP-PA2-SO-07-111122	XK14005-008	Soil	11/11/2022		X		
LHAAP-PA2-SO-13-111022	XK14005-009	Soil	11/10/2022		X		
LHAAP-PA2-SO-08-111122	XK14005-010	Soil	11/11/2022		X		
LHAAP-BG3-SO-03-111022	XK14005-011	Soil	11/10/2022		X		
LHAAP-FWDF-SO-01-111122	XK14005-012	Soil	11/11/2022		X		
LHAAP-PA2-SO-12-111022	XK14005-013	Soil	11/10/2022		X		
LHAAP-PA2-SO-11-111022	XK14005-014	Soil	11/10/2022		X		
LHAAP-PA2-SO-02-111022	XK14005-015	Soil	11/10/2022		X		
LHAAP-04WW01-111122	XK14005-017	Water	11/11/2022		X		
LHAAP-04WW07-111122	XK14005-018	Water	11/11/2022		X		
LHAAP-LHSMW01-111122	XK14005-019	Water	11/11/2022		X		
LHAAP-35AWW20-111122	XK14005-020	Water	11/11/2022		X		
LHAAP-35AWW16-111122	XK14005-021	Water	11/11/2022		X		
LHAAP-BG3-SO-01-111022	22211162301	Soil	11/10/2022			X	X
LHAAP-PA2-SO-02-111022	22211162302	Soil	11/10/2022			X	X

Notes:

DATA REVIEW REPORT

1. Stage 3/4 validation was performed on sample locations LHAAP-LHSMW01-111122, and LHAAP-35AWW20-111122.
2. Matrix spike/matrix spike duplicate (MS/MSD) analysis was performed on sample location LHAAP-FWDF-SO-01-111122.

DATA REVIEW REPORT

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of QA or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

Note:
QA - Quality Assurance

1. The sample ID LHAAP-PA2-SO-02-111022 listed twice on chain of custody as XK14005-015 and XK14005-016. Hence, the laboratory reported results for XK14005-015.

2. As per project team communication the sample IDs LHAAP-PA2-SO-06-111022 (XK14005-001), LHAAP-PA2-SO-05-111022 (XK14005-002), LHAAP-PA2-SO-02-111022 (XK14005-004), LHAAP-PA2-SO-03-111022 (XK14005-008), LHAAP-PA2-SO-04-111022 (XK14005-010), LHAAP-PA2-SO-07-111022 (XK14005-014), LHAAP-PA2-SO-01-111022 (XK14005-015) are corrected as LHAAP-PA2-SO-10-111122, LHAAP-PA2-SO-09-111122, LHAAP-PA2-SO-06-111022, LHAAP-PA2-SO-07-111122, LHAAP-PA2-SO-08-111122, LHAAP-PA2-SO-11-111022, LHAAP-PA2-SO-02-111022 respectively.

3. Sample locations listed with -20221111 in the sample ID on the chain of custody were revised to -111122 per communication from the project team to the laboratory.

DATA REVIEW REPORT

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Modified Method 537. Data were reviewed in accordance with USEPA Method 537, Pace (Shealy) Laboratories SOP ME00213-12 Determination of Per- and Polyfluoroalkyl Substances (PFAS) by LC/MS/MS (Isotope Dilution) QSM 5.3 Table B-15, Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, DoD Final Data Validation Guidelines Module 3: PFAS, May 2020, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified, and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Per DoD General Data Validation Guidelines November 2019 Revision 1 Section 4.8 states; "The following provides a brief explanation of the DoD data validation qualifiers assigned to results during the data review process by a data validator. The reviewer should use these qualifiers, as applicable, unless other data qualifiers are specified in a project related document, such as a QAPP. If other qualifiers are used, a complete explanation of those qualifiers should accompany the data validation report." Below are the qualifier codes that may be applied in this validation report:

- Concentration (C) Qualifiers
  - U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The reported result was an estimated value with an unknown bias.
  - J+ The result was an estimated quantity, but the result may be biased high.
  - J- The result was an estimated quantity, but the result may be biased low.
  - UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.
  - UB Compound considered non-detect at the listed value due to associated blank contamination.
  - X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA modified 537 DoD QSM 5.3	Soil	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C
	Water	28 days to extraction; 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

The holding time has been changed from the original holding time documented in EPA 537 of 14 days for extraction to 28 days. This was documented in EPA Technical Brief EPA/600/F-17/022h Updated January 2020. Utilizing the new guidance of 28 days all samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method, instrument, and equipment rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Instrument blanks measure carryover in the instrument from one sample to another. Method blanks measure laboratory contamination. Equipment rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The percent relative standard deviation (%RSD) of the response factors (RF) must be less than 20%, or for linear calibration, $r^2 \geq 0.99$. Analytes must be within 70-130% of their true value for each calibration standard. The initial calibration verification (ICV) standard must be within 70-130% of their true value.

The initial calibration, calibration and ICV standard recoveries were acceptable.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit of 30%.

All compounds associated with the initial and continuing calibrations were within the specified control limits.

4.3 Instrument Sensitivity Check (ISC)

The ISC concentration must be at the LOQ. All target compounds associated with the ISC must exhibit a percent recovery (%R) of 70 to 130%.

All compounds associated with ISC recoveries were within control limits.

4.4 Ion Transitions

Quantitation of analytes must use the ion transitions documented in DoD QSM 5.3 Table B-15.

The ion transitions were as specified in DoD QSM 5.3.

5. Extracted Internal Standards (EIS)

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within 50% to 150% of ICAL midpoint standard area or area measured in the initial CCV on days when ICAL not performed.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	EIS	Associated Compounds	%R	RE %R
LHAAP-PA2-SO-12-111022	13C2_8:2FTS	8:2FTS	**> 150%**	Not Analyzed
LHAAP-04WW07-111122	13C2_6:2FTS	6:2FTS	**> 150%**	Not Analyzed
	13C2_8:2FTS	8:2FTS	**> 150%**	Not Analyzed
LHAAP-35AWW20-111122	13C2_6:2FTS	6:2FTS	**> 150%**	AC
	13C4_PFBA	Perfluoro-n-butanoic acid (PFBA)	< 50% but > 20%	**AC**

Note:
AC Acceptable

Where a re-extracted analysis was performed, results are reported from the analysis in bold above.

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 150%	Non-detect	No Action
	Detect	J-
< 50% but > 20%	Non-detect	UJ
	Detect	J+
< 20%	Non-detect	UX

Control Limit	Sample Result	Qualification
	Detect	X

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must be ≤ 30%.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD analysis performed on sample location LHAAP-FWDF-SO-01-111122 exhibited acceptable recoveries.

Sample location associated with MS/MSD recoveries exhibiting an RPD greater than the control limit presented in the following table.

Sample Location	Compounds
LHAAP-FWDF-SO-01-111122	EtFOSAA
	MeFOSAA

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> 30%	Non-detect	UJ
	Detect	J

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the DoD QSM 5.3 acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 35% for water matrices and 50% for soils is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of two times the LOQ is applied for water matrices and three times the LOQ for soil matrices.

A field duplicate was not collected for a sample location associated with this SDG.

9. Compound Identification

PFC analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

Sample result associated with compound that exhibited a concentration greater than the linear range of the instrument calibration are summarized in the following table.

Sample ID	Compound	Original Analysis	Diluted Analysis	Reported Analysis
LHAAP-LHSMW01-111122	Perfluoro-n-nonanoic acid (PFNA)	680 E	700	700 D

Note: In the instance where both the original analysis and the diluted analysis sample results exhibited a concentration greater than and/or less than the calibration linear range of the instrument; the sample result exhibiting the greatest concentration will be reported as the final result.

Sample results associated with compounds exhibiting concentrations greater than the linear range are qualified as documented in the table below when reported as the final reported sample result.

Reported Sample Results	Qualification
Diluted sample result within calibration range	D
Diluted sample result less than the calibration range	DJ
Diluted sample result greater than the calibration range	EDJ
Original sample result greater than the calibration range	EJ

10. System Performance and Overall Assessment

Note a number of results were manually integrated which were spot checked. The manual quantitation (M-03) laboratory qualifier has been revised to "M" and preserved with the data as informational data for the end user; there was no impact on the data usability. The manual quantitation (M-03) laboratory qualifier associated with data reported as non-detect have been removed.

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
Stage 2 Validation					
Holding times		X		X	
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
C. Field blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R		X		X	
Matrix Spike Duplicate (MSD) %R		X		X	
MS/MSD Precision (RPD)		X	X		
Field Duplicate (RPD)	X				X
Extracted Internal Standard %R		X	X		
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Instrument tune and performance check		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration %Ds		X		X	
Instrument sensitivity check		X		X	
Ion transitions used		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Ion Ratio %R		X		X	

DATA REVIEW REPORT

PFAS: 537M/DoD QSM 5.3	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
LIQUID CHROMATOGRAPHY/MASS SPECTROMETRY (LC/MS/MS)					
E. Transcription/calculations acceptable		X		X	
F. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW REPORT

INORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Methods 9045D and 9060A. Data were reviewed in accordance with Department of Defense (DoD) Quality Systems Manual (QSM) 5.3, DoD General Data Validation Guidelines, November 2019, and Final Programmatic Uniform Federal Policy-Quality Assurance Project Plan USAEC PFAS PA/SI Active Army Installations, October 2019 (Arcadis).

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and that it was already subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes:

- Concentration (C) Qualifiers

  U The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

  J The reported value was obtained from a reading less than the limit of detection (LOQ), but greater than or equal to the detection limit (DL).

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

- Validation Qualifiers

  J The reported result was an estimated value with an unknown bias.

  J+ The result was an estimated quantity, but the result may be biased high.

  J- The result was an estimated quantity, but the result may be biased low.

  UJ The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  X The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

A fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA REVIEW REPORT

GENERAL CHEMISTRY ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
Total Organic Carbon (TOC) by SW846 9060A	Soil	28 days from collection to analysis	Cool to <6 °C.
pH by SW846 9045D	Soil	Within 24 hours of receipt at laboratory	Cool to <6 °C.

The analyses that exceeded the holding time are presented in the following table.

Sample Locations	Holding Time	Criteria
LHAAP-BG3-SO-01-111022 LHAAP-PA2-SO-02-111022	25 days from collection; 21 days from receipt	Within 24 hours of receipt at laboratory

Sample results associated with sample locations analyzed by analytical method SW-846 9045D were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification
	Detected Analytes
Analysis completed past holding time	J

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank is calculated for QA blanks containing concentrations greater than the detection limit (DL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

TOC was not detected above the DL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

The correct number and type of standards were analyzed. The correlation coefficient of the initial calibration was greater than 0.995 and all initial calibration verification standard recoveries were within control limits. The calibration verification limit for pH is within ± 0.05 su of the true value.

pH: The initial and continuing calibration criteria were within the acceptance criteria of ± 0.05 SU of the true value.

TOC: The calibration criteria were within the acceptance limit.

4. Matrix Spike (MS)/Laboratory Duplicate Analysis

MS and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 MS Analysis

All analytes must exhibit a percent recovery within the established acceptance limits of 75% to 125%. The MS recovery control limits do not apply for MS performed on sample locations where the analyte's concentration detected in the parent sample exceeds the MS concentration by a factor of four or greater.

A MS analysis was not performed for TOC analysis.

4.2 Laboratory Duplicate Analysis

The laboratory duplicate relative percent difference (RPD) criterion is applied when parent and duplicate sample concentrations are greater than or equal to 5 times the LOQ. A control limit of 20% for water matrices and 35% for soil matrices is applied when the criteria above is true. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of one time the LOQ is applied for water matrices and two times the LOQ for soil matrices. The laboratory duplicate control limits for soil pH is ≤ 0.1 su.

A laboratory duplicate analysis was not performed for pH.

All analytes associated with laboratory duplicate RPD were within the control limit, with the exception of the analytes presented in the following table.

Sample Location	Analyte	Laboratory RPD
LHAAP-BG3-SO-01-111022	TOC	38% 40%

The criteria used to evaluate laboratory duplicate RPD are presented in the following table. In the case of a laboratory duplicate RPD deviation, the sample results are qualified.

Sample Concentration	Control Limit	Sample Result	Qualification
Parent sample and laboratory sample concentration >5 times LOQ	Soil: 35% RPD	Non-detect	UJ
		Detect	J

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 50% for soil matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the LOQ, a control limit of three times the LOQ is applied for soil matrices.

Field duplicate analysis was not performed on a sample location within this SDG.

6. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The analytes associated with the LCS analysis must exhibit a percent recovery between the control limits of 80% and 120%.

The LCS analysis exhibited recoveries within the control limits.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW REPORT

DATA VALIDATION CHECKLIST FOR GENERAL CHEMISTRY

General Chemistry: SW846 9045D/9060A	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
Miscellaneous Instrumentation					
Stage 2 Validation					
Holding times		X	X		
Reporting limits (units)		X		X	
Blanks					
A. Method blanks		X		X	
B. Equipment blanks	X				X
Laboratory Control Sample (LCS) %R		X		X	
Laboratory Control Sample Duplicate (LCSD) %R	X				X
LCS/LCSD Precision (RPD)	X				X
Matrix Spike (MS) %R	X				X
Matrix Spike Duplicate (MSD) %R	X				X
MS/MSD Precision (RPD)	X				X
Lab Duplicate (RPD)		X	X		
Field Duplicate (RPD)	X				X
Dilution Factor		X		X	
Moisture Content		X		X	
Stage 3/4 Validation					
Initial calibration correlation coefficient		X		X	
Continuing calibration %R		X		X	
Raw Data		X		X	
Transcription/calculations acceptable		X		X	
Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:
%R - percent recovery
RPD - relative percent difference

DATA REVIEW REPORT

VALIDATION PERFORMED BY: Pruthvi Kumar C, Arcadis

SIGNATURE:

DATE: December 26, 2022

PEER REVIEW: Dennis Capria, Arcadis

DATE: January 5, 2023

Stage 3 / 4
PFAS Calibration Standards

SDG #: XK14005
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/26/2022
Page: 1
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3
Instrument : LCMSMS01.i
PFPeA 11/8/2022 Calibration

Pg 284-294 of SDG XK14005

Cal Conc ng/L	Std Area	EIS Area	EIS Conc ng/L	Area Ratio	Calculated RF	Avg RF	Calc Amount ng/L	Tvalue ng/L	%R Calc Amount/ Tvalue	Reported %R	
100	78715	1456054	2000	0.05406	1.08121	1.084065	99.74	100	99.74	99.7	MATCH
200	154738	1458265	2000	0.106111	1.06111	1.084065	195.77	200	97.88	97.9	MATCH
500	410943	1518234	2000	0.270672	1.08269	1.084065	499.36	500	99.87	99.9	MATCH
1000	740470	1306360	2000	0.566819	1.13364	1.084065	1045.73	1000	104.57	104.6	MATCH
2000	1495356	1410480	2000	1.060175	1.06018	1.084065	1955.93	2000	97.80	97.8	MATCH
5000	4021274	1535280	2000	2.619245	1.04770	1.084065	4832.27	5000	96.65	96.6	MATCH
10000	7543591	1358984	2000	5.550905	1.11018	1.084065	10240.91	10000	102.41	102.4	MATCH
15000	11179726	1369418	2000	8.163852	1.08851	1.084065	15061.55	15000	100.41	100.4	MATCH
20000	14654788	1342789	2000	10.91369	1.09137	1.084065	20134.76	20000	100.67	100.7	MATCH
				Avg RF	1.0840647	MATCH					

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/Avg RF)

Stage 3 / 4
PFAS ICV CCV Standards %R

SDG #: XK14005 Date: 12/26/2022
Lab: Pace (Shealy) Page: 2
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS01.i File ID: 110822B018.d
ICV_1000_SVLC-2193 08-Nov-2022 18:44:56 Page 494 of SDG XK14005

Analyte	ICV ng/L	ICV TV ng/L	Calculated %R	Reported %R	
PFOA	776.65	1000	77.67	77.7	MATCH
PFNA	947.86	1000	94.79	94.8	MATCH
PFPeA	909.33	1000	90.93	90.9	MATCH

Instrument: LCMSMS01.i File ID: 111822005.d
CCV 200_SVLC-2261 18-Nov-2022 13:55:36 Page 609 of SDG XK14005
This CCV is applicable for the sample LHAAP-LHSMW01-111122 (XK14005-019)

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFOA	171.13	200	85.57	85.6	MATCH
PFNA	187.57	200	93.79	93.8	MATCH
PFPeA	197.00	200	98.50	98.5	MATCH

Instrument: LCMSMS01.i File ID: 112922005.d
CCV 200_SVLC-2261 29-Nov-2022 12:01:48 Page 714 of SDG XK14005
This CCV is applicable for the sample LHAAP-35AWW20-111122 (XK14005-020)

Analyte	CCV ng/L	CCV TV ng/L	Calculated %R	Reported %R	
PFOA	239.38	200	119.69	119.7	MATCH
PFNA	198.81	200	99.41	99.4	MATCH
PFPeA	204.64	200	102.32	102.3	MATCH

Stage 3 / 4
PFAS LCS

SDG #: XK14005 Date: 12/26/2022
Lab: Pace (Shealy) Page: 3
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Instrument: LCMSMS01.i
LCS XQ60194-002 Pg 918-922 of SDG XK14005
This LCS is applicable for the samples LHAAP-LHSMW01-111122 (XK14005-019), LHAAP-35AWW20-111122 (XK14005-020) Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extracted Sample Volume mls	Calculated ng/L	True Value ng/L	Calculated Percent Recovery	Reported Percent Recovery	
PFOA	551810	1511486	2000	0.365078	0.973574	749.97	250	15.00	16	93.7	94	MATCH
PFNA	534719	1531853	2000	0.349067	0.891482	783.12	250	15.66	16	97.9	98	MATCH
PFPeA	684842	1613836	2000	0.424357	1.084065	782.90	250	15.66	16	97.9	98	MATCH

Differences in %R may be due to rounding of the true value
Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated amount ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS MS/MSD

SDG #: XK14005 Date: 12/26/2022
Lab: Pace (Shealy) Page: 4
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

MS/MSD Sample ID LHAAP-FWDF-SO-01-111122 Page 983 and 1004 of SDG XK14005
ANALYTE PFDA
REPORTED MS %R 94
REPORTED MSD %R 91
REPORTED RPD 10

$$\%R = \frac{100 * (\text{MS Conc} - \text{Sample Conc})}{\text{MS TV}} \qquad RPD = \frac{100 * |\ \text{MS \%R} - \text{MSD \%R}}{\text{Average of MS MSD \%R}}$$

Sample Concentration	0			
MS Concentration	0.0019	MS %R	95.00	MATCH
MSD Concentration	0.0021	MSD %R	91.30	MATCH
MS TV	0.0020	RPD	10.00	MATCH
MSD TV	0.0023			

Differences in %R may be due to rounding of the true value

Stage 3 / 4
PFAS Sample Concentration

SDG #: XK14005
Lab: Pace (Shealy)
Project: LHAAP PFAS PA/SI

Date: 12/26/2022
Page: 5
Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-LHSMW01-111122 Lab ID: XK14005-019 Page 213 & 245 of SDG XK14005
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFOA	1071123	1359084	2000	0.788121	0.973574	1619.03	5	282.94	28.61	29	Match
PFNA	6476426	368657	2000	17.56762	0.891482	39412.17	5	282.94	696.48	700	Match
PFOS	82298	513602	2000	0.160237	1.16785	274.41	5	282.94	4.85	4.8	Match

Field Sample: LHAAP-35AWW20-111122 Lab ID: XK14005-020 Page 256 of SDG XK14005
Final volume = 5ml

Analyte	Area	EIS Area	EIS Conc ng/L	Area Ratio	Avg RF	Calculated Amount ng/L	Extract Final Volume mls	Extracted Sample Volume mls	Calculated ng/L	Reported Value ng/L	
PFOA	104430	1749508	2000	0.059691	0.973574	122.62	5	267.63	2.29	2.3 J	Match

Calculated Amount ng/L = ((Area Ratio x EIS Conc)/RF)
Calculated ng/L = ((calculated ng/L x 5 mls) / extracted sample volume mls)

Stage 3 / 4
PFAS EIS

SDG #: XK14005 Date: 12/26/2022
Lab: Pace (Shealy) Page: 6
Project: LHAAP PFAS PA/SI Validated by: PK

Method: EPA modified 537 per DoD QSM 5.3

Field Sample: LHAAP-LHSMW01-111122 Lab ID: XK14005-019

EIS 13C2_PFTeDA
REPORTED EIS %R 96

%R = 100 * EIS Area / CCV 200 EIS Area

EIS Area 1167288 Page 233 of SDG XK14005
CCV 200 EIS Area 1222194 Page 521 of SDG XK14005
%R 95.5 MATCH

Field Sample: LHAAP-35AWW20-111122 Lab ID: XK14005-020

EIS 13C4_PFHpA
REPORTED EIS %R 94

%R = 100 * EIS Area / CCV 200 EIS Area

EIS Area 1489102 Page 257 of SDG XK14005
CCV 200 EIS Area 1580903 Page 519 of SDG XK14005
%R 94.2 MATCH

CHAIN OF CUSTODY
SAMPLE ANALYSIS DATA SHEETS

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 140758

Client: USACE
Address: DENVER, CO
City: KOMMACK | State: TX | Zip Code: 75161
Project Name: LHAAP
Project No.: 3000/997
P.O. No.:
Report to Contact: Donna Shimcott
Sampler's Signature: x Donna Shimcott
Printed Name: Donna Shimcott
Telephone No. / Email: (801)544-1272 dshimcot@arcadis.com
Analysis (Attach list if more space is needed)
Page 1 of 3
XK14005
Lab #
Barcode / Container ID

Sample ID / Description (Container ID for each sample may be combined on one line)	Collection Date	Collection Time (Military)	Sample Origin Code	Matrix: Solid	Matrix: Liquid	Matrix: Wipe	No. of Containers or Preservative Type: Unpres	HNO3	H2SO4	NaOH	HCl	Methanol	Other	Analysis: PFAS, Grain Size TOC, pH
LHAAP-PA2-SO-016	11/11/22	13:20	G	X			X							
LHAAP-PA2-SO-05	11/11/22	11:40												
LHAAP-B63-SO-01	11/10/22	11:15												
LHAAP-PA2-SO-02	11/10/22	15:50												
LHAAP-B63-SO-04	11/10/22	11:45												
LHAAP-B63-SO-05	11/10/22	09:50												
LHAAP-B63-SO-02	11/10/22	10:55												
LHAAP-PA2-SO-03	11/11/22	10:05												
LHAAP-PA2-SO-13	11/10/22	14:40												
LHAAP-PA2-SO-04	11/11/22	11:00												

Turn Around Time Required (Prior lab approval required for expedited TAT)
[X] Standard [ ] Rush (Specify)

Sample Disposal
[ ] Return to Client [ ] Disposal by Lab

Possible Hazard Identification
[ ] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [X] Unknown

QC Requirements (Specify)

	Date	Time
1. Relinquished by	11/11/22	14:40
2. Relinquished by		
3. Relinquished by		
4. Relinquished by	11/14/22	1000

	Date	Time
1. Received by		
2. Received by		
3. Received by		
4. Laboratory received by	11/14/22	1000

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle) (Yes) No Ice Pack Receipt Temp 0.4 °C
Temp Blank: (Y) N

DISTRIBUTION: WHITE & YELLOW/Return to laboratory with shipment(s); PINK-Field/Client Copy

Document Number: MEXR0001

PACE ANALYTICAL SERVICES, LLC

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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PACE ANALYTICAL SERVICES, LLC

Pace Analytical

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106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 140757

Client: USACE
Address: 2LARMAR DR.
City: KARNACK State: TX Zip Code: 75661
Project Name: LHAAP
Project No.: 56101997
P.O. No.:
Report to Contact:
Sampler's Signature: x Wyndsor D DeRamus
Printed Name:
Telephone No. / E-mail: (903) 926-1272 Danny.Shmidt@parsons.com
Analysis (Attach list if more space is needed)
Pres.: 2 of 2
Quote No.: XK14005
Matrix
No. of Containers by Preservative Type
Sample ID / Description (Each sample must be identified on this line.)
Collection Date
Collection Time (Military)
Remarks / Comp. I.D.

Sample ID / Description	Collection Date	Collection Time	Matrix	No. of Containers
LHAAP-BW3-SO-03	11/01/22	10:15	SO	X
LHAAP-FWIDF-SO-01	11/01/22	08:55	SO	X
LHAAP-PA2-SO-12	11/10/22	14:25	SO	X
LHAAP-PA2-SO-07	11/10/22	14:05	SO	X
LHAAP-PA2-SO-01	11/10/22	15:20	SO	X
LHAAP-PA2-SO-01	11/10/22	15:20	SO	X
LHAAP-04-MW01-20221111	11/11/22	09:15	GW	X
LHAAP-04-MW07-20221111	11/11/22	10:10	GW	X
LHAAP-LHSM-W01-20221111	11/11/22	10:55	GW	X
LHAAP-35AMW20-20221111	11/11/22	12:00	GW	X

Please analyze for TOC with FD

Turn Around Time Required (Prior lab approval required for expedited TAT): Standard Rush (Specify)
Sample Disposal: Return to Client Disposal by Lab
Possible Hazard Identification: Non-hazard Flammable Skin Irritant Poison B Unknown
QC Requirements (Specify)

1. Relinquished by: Wyndsor D. DeRamus — Date: 11/14/22 — Time: 14:40
2. Relinquished by: — Date: — Time:
3. Relinquished by: — Date: — Time:
4. Relinquished by: — Date: 11/14/22 — Time: 1600

1. Received by: — Date: — Time:
2. Received by: — Date: — Time:
3. Received by: — Date: — Time:
4. Laboratory received by: Ashley Kuntz — Date: 11/14/22 — Time: 1630

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle): Yes No Ice Pack
Received Temp: 0.4 °C
Temp Blank: Yes No

DISTRIBUTION: WHITE & YELLOW return to laboratory with Sample(s); PINK Field/Client Copy

Document Number: MEI0004-01

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
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Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Pace Analytical

PACE ANALYTICAL SERVICES, LLC

Number 140838

Client: USACE
Address: BEAUMONT OR
City: COMANCH State: TX Zip Code: 76526
Project Name: LHAAP
Project No: 3000 0777
Report To Contact: DANA SCHMIDT
Sampler's Signature: X DANA SCHMIDT
Printed Name: DANA SCHMIDT
Telephone No. / E-mail: (817) 240-1272 DANA.SCHMIDT@ARCADIS-US.COM
Quote No.
Page 3 of 3
Analysis (Attach list if more space is needed)
PRES QSM
XK14005
Remarks / Order ID

Sample ID / Description (Containing (max) sample number of characters per box)	P.O. No. / Customer Sample #	Collection Date (MM/DD/YY)	Collection Time (Military)	Number of Containers	Matrix: Liquid	Matrix: Soil	Matrix: Other	Matrix: Air	Matrix: Wipe	Matrix: Tissue	Matrix: Fish	Matrix: Other	Metal Containers by Preservative Type: HNO3	Metal Containers by Preservative Type: H2SO4	Metal Containers by Preservative Type: NaOH	Metal Containers by Preservative Type: Other
LHAAP-35-WW10-20121111		11/11/12	13:25	6	X								X			

Turn Around Time Required (may be lengthened/shortened for expedited TAT)
Standard Rush (Specify)

Sample Disposal: Return to Client Disposal by Lab
Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown
QC Requirements (Specify)

	Date	Time
1. Relinquished by	11/11/12	14:40
2. Relinquished by		
3. Relinquished by		
4. Relinquished by	11/14/12	1000

	Date	Time
1. Received by		
2. Received by		
3. Received by		
4. Laboratory received by	11/14/12	1000

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on Ice (Circle): (Yes) No Ice Pack Receipt Temp 3.4 °C
Temp Blank: Y N

DISTRIBUTION: White is YELLOW-Return to Laboratory with Sample(s); Pink-Field Client Copy

Document Number: MEI0004.01

PACE ANALYTICAL SERVICES, LLC

DOD PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001 NELAC No: E87653 NC DENR No: 329 NC Field Parameters No: 5639

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: XK14005

Project Name: LHAAP

Project Number: 30001997

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XK14005-001	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-003	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-004	1	1H, 1H, 2H, 2H-perfluorooctane sulfonic	M-03
PFAS by ID SOP	XK14005-004	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-005	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-005	1	13C6_PFDA	M-03
PFAS by ID SOP	XK14005-006	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-007	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	XK14005-007	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-008	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-010	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-012	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-013	1	13C2_8:2FTS	M-03
PFAS by ID SOP	XK14005-014	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-018	1	Perfluoro-1-butanesulfonic acid (PFBS)	M-03
PFAS by ID SOP	XK14005-018	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XK14005-019	1	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	XK14005-019	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	XK14005-019	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XK14005-019	1	Perfluoro-n-tridecanoic acid (PFTrDA)	M-03
PFAS by ID SOP	XK14005-019	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-019	2	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XK14005-019	2	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	XK14005-019	2	Perfluoro-n-hexanoic acid (PFHxA)	M-03
PFAS by ID SOP	XK14005-019	2	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XK14005-019	2	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XK14005-020	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XK14005-021	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XK14005-021	1	13C2_PFDoA	M-03
PFAS by ID SOP	XK14005-021	1	13C4_PFBA	M-03
PFAS by ID SOP	XK14005-012MS	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XQ60330-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XK14005-012MD	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ60330-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XK14005-012MD	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ60330-001	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XQ60330-002	1	Perfluoro-n-decanoic acid (PFDA)	M-03

DOD PACE ANALYTICAL SERVICES, LLC

SC DHEC No: 32010001 NELAC No: E87653 NC DENR No: 329 NC Field Parameters No: 5639

Manual Integration Summary

Arcadis U.S., Inc.

Lot Number: XK14005

Project Name: LHAAP

Project Number: 30001997

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XK14005-012MD	1	Perfluoro-n-decanoic acid (PFDA)	M-03
PFAS by ID SOP	XK14005-012MS	1	Perfluoro-n-nonanoic acid (PFNA)	M-03
PFAS by ID SOP	XQ60330-002	1	Perfluoro-n-octanoic acid (PFOA)	M-03
PFAS by ID SOP	XQ60330-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ60330-002	1	13C2_8:2FTS	M-03
PFAS by ID SOP	XQ60194-002	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XQ60194-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ60194-002	1	13C2_8:2FTS	M-03
PFAS by ID SOP	XQ61078-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ61078-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ61078-001	1	13C2_8:2FTS	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-001	
Description: LHAAP-PA2-SO-10-111122		Matrix: Solid	
Date Sampled: 11/11/2022 1320	Project Name: LHAAP	% Solids: 83.1	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1924	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	~~UM-03~~ U	0.0012	0.00060	0.00024	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		90	50-150
13C2_8:2FTS		125	50-150
13C2_PFDoA		100	50-150
13C2_PFTeDA		134	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		97	50-150
13C4_PFBA		89	50-150
13C4_PFHpA		117	50-150
13C5_PFHxA		85	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		83	50-150
13C8_PFOA		91	50-150
13C8_PFOS		91	50-150
13C9_PFNA		90	50-150
d5-EtFOSAA		87	50-150
d3-MeFOSAA		90	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-002	
Description: LHAAP-PA2-SO-09-111122		Matrix: Solid	
Date Sampled: 11/11/2022 1140	Project Name: LHAAP	% Solids: 80.6	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1934	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		102	50-150
13C2_8:2FTS		124	50-150
13C2_PFDoA		114	50-150
13C2_PFTeDA		118	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		114	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		120	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		125	50-150
13C8_PFOS		108	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		109	50-150
d3-MeFOSAA		107	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Inorganic non-metals

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-003	
Description: LHAAP-BG3-SO-01-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1115	Project Name: LHAAP	% Solids: 86.1	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/05/2022 1647	BMG2		61809

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 15.5 ° C		9045D	7.8	J				su	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-003	
Description: LHAAP-BG3-SO-01-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1115	Project Name: LHAAP	% Solids: 86.1	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1945	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00058	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	~~UM-03~~ U	0.0012	0.00060	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		97	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		109	50-150
13C2_PFTeDA		123	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		114	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		106	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		106	50-150
13C8_PFOS		108	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		107	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-004	
Description: LHAAP-PA2-SO-06-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1550	Project Name: LHAAP	% Solids: 78.6	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 1956	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	~~UM-03~~ U	0.0024	0.0012	0.00060	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0024	0.0012	0.00060	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00060	U	0.0012	0.00060	0.00024	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00060	~~UM-03~~ U	0.0012	0.00060	0.00024	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		114	50-150
13C2_8:2FTS		123	50-150
13C2_PFDoA		118	50-150
13C2_PFTeDA		131	50-150
13C3_PFBS		108	50-150
13C3_PFHxS		109	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		120	50-150
13C5_PFHxA		132	50-150
13C5_PFPeA		109	50-150
13C6_PFDA		114	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		109	50-150
13C8_PFOS		108	50-150
13C9_PFNA		116	50-150
d5-EtFOSAA		120	50-150
d3-MeFOSAA		117	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-005	
Description: LHAAP-BG3-SO-04-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1145	Project Name: LHAAP	% Solids: 87.1	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2006	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00056	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00056	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00056	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00056	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	~~UM-03~~ U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		92	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		112	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		98	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		99	50-150
13C6_PFDA	M-03	98	50-150
13C7_PFUdA		91	50-150
13C8_PFOA		105	50-150
13C8_PFOS		102	50-150
13C9_PFNA		96	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-006	
Description: LHAAP-BG3-SO-05-111022		Matrix: Solid	
Date Sampled: 11/10/2022 0950	Project Name: LHAAP	% Solids: 86.1	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2017	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.00095	U	0.0019	0.00095	0.00048	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00049	U	0.00097	0.00049	0.00019	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00049	~~UM-03~~ U	0.00097	0.00049	0.00019	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		89	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		118	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		108	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		121	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		103	50-150
13C8_PFOS		104	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-007	
Description: LHAAP-BG3-SO-02-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1055	Project Name: LHAAP	% Solids: 85.6	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2027	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055 ~~UM-03~~	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055 ~~UM-03~~	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		95	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		105	50-150
13C2_PFTeDA		114	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		100	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		98	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		95	50-150
13C8_PFOS		108	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		107	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-008	
Description: LHAAP-PA2-SO-07-111122		Matrix: Solid	
Date Sampled: 11/11/2022 1005	Project Name: LHAAP	% Solids: 77.9	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2038	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00053	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	~~UM-03~~ U	0.0011	0.00055	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		111	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		113	50-150
13C2_PFTeDA		126	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		124	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		124	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		107	50-150
13C7_PFUdA		89	50-150
13C8_PFOA		111	50-150
13C8_PFOS		108	50-150
13C9_PFNA		108	50-150
d5-EtFOSAA		112	50-150
d3-MeFOSAA		114	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-009	
Description: LHAAP-PA2-SO-13-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1440	Project Name: LHAAP	% Solids: 77.1	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2049	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00055	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00055	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00055	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00055	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		87	50-150
13C2_8:2FTS		109	50-150
13C2_PFDoA		104	50-150
13C2_PFTeDA		110	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		95	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		82	50-150
13C5_PFPeA		92	50-150
13C6_PFDA		99	50-150
13C7_PFUdA		88	50-150
13C8_PFOA		94	50-150
13C8_PFOS		95	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		110	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-010	
Description: LHAAP-PA2-SO-08-111122		Matrix: Solid	
Date Sampled: 11/11/2022 1100	Project Name: LHAAP	% Solids: 79.7	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2059	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0022	0.0011	0.00056	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00022	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	~~UM-03~~ U	0.0011	0.00055	0.00022	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		103	50-150
13C2_8:2FTS		123	50-150
13C2_PFDoA		112	50-150
13C2_PFTeDA		120	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		106	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		100	50-150
13C5_PFHxA		123	50-150
13C5_PFPeA		91	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		109	50-150
13C8_PFOA		101	50-150
13C8_PFOS		114	50-150
13C9_PFNA		117	50-150
d5-EtFOSAA		111	50-150
d3-MeFOSAA		111	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-011	
Description: LHAAP-BG3-SO-03-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1015	Project Name: LHAAP	% Solids: 78.9	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2131	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		88	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		90	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		88	50-150
13C3_PFHxS		105	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		95	50-150
13C5_PFHxA		73	50-150
13C5_PFPeA		89	50-150
13C6_PFDA		115	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		100	50-150
13C8_PFOS		93	50-150
13C9_PFNA		89	50-150
d5-EtFOSAA		111	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-012	
Description: LHAAP-FWDF-SO-01-111122		Matrix: Solid	
Date Sampled: 11/11/2022 0855	Project Name: LHAAP	% Solids: 83.2	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2142	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00050	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0010	U UJ	0.0020	0.0010	0.00050	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0010	U UJ	0.0020	0.0010	0.00050	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	U M-03 U	0.0010	0.00050	0.00020	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		93	50-150
13C2_8:2FTS		103	50-150
13C2_PFDoA		120	50-150
13C2_PFTeDA		117	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		138	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		120	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		100	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		101	50-150
13C8_PFOS		100	50-150
13C9_PFNA		105	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-013	
Description: LHAAP-PA2-SO-12-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1425	Project Name: LHAAP	% Solids: 83.0	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2214	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0012 ~~UQ~~	U	0.0023	0.0012	0.00057	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0012	U	0.0023	0.0012	0.00057	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00055	U	0.0011	0.00055	0.00023	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		111	50-150
13C2_8:2FTS	M-03N	153	50-150
13C2_PFDoA		116	50-150
13C2_PFTeDA		133	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		123	50-150
13C4_PFBA		109	50-150
13C4_PFHpA		146	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		116	50-150
13C6_PFDA		117	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		121	50-150
13C8_PFOS		137	50-150
13C9_PFNA		116	50-150
d5-EtFOSAA		117	50-150
d3-MeFOSAA		121	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-014	
Description: LHAAP-PA2-SO-11-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1405	Project Name: LHAAP	% Solids: 81.7	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2224	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0011	U	0.0021	0.0011	0.00052	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00021	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	~~UM-03~~ U	0.0010	0.00050	0.00021	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		101	50-150
13C2_8:2FTS		121	50-150
13C2_PFDoA		126	50-150
13C2_PFTeDA		129	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		112	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		94	50-150
13C5_PFPeA		98	50-150
13C6_PFDA		103	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		96	50-150
13C8_PFOS		103	50-150
13C9_PFNA		98	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		108	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Inorganic non-metals

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-015	
Description: LHAAP-PA2-SO-02-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1520	Project Name: LHAAP	% Solids: 94.0	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		(Soil pH meas) 9045D	1	12/05/2022 1649	BMG2		61809

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Soil pH measured in water @ 16.4 ° C		9045D	6.6	J				su	1

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-015	
Description: LHAAP-PA2-SO-02-111022		Matrix: Solid	
Date Sampled: 11/10/2022 1520	Project Name: LHAAP	% Solids: 94.0	11/25/2022 1752
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/18/2022 2235	BWS	11/16/2022 1954	60330

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00051	mg/Kg	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00051	mg/Kg	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00051	mg/Kg	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	0.0010	U	0.0020	0.0010	0.00051	mg/Kg	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	0.00050	U	0.0010	0.00050	0.00020	mg/Kg	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		98	50-150
13C2_8:2FTS		111	50-150
13C2_PFDoA		112	50-150
13C2_PFTeDA		115	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		107	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		108	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		105	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		93	50-150
13C8_PFOA		110	50-150
13C8_PFOS		119	50-150
13C9_PFNA		109	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		107	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-017	
Description: LHAAP-04WW01-111122		Matrix: Aqueous	
Date Sampled: 11/11/2022 0915	Project Name: LHAAP		
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1941	BWS	11/16/2022 0933	60194

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.6	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.8	1.9	0.95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		146	50-150
13C2_8:2FTS		110	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		119	50-150
13C3_PFHxS		118	50-150
13C4_PFBA		108	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		126	50-150
13C5_PFPeA		126	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		102	50-150
13C8_PFOA		115	50-150
13C8_PFOS		110	50-150
13C9_PFNA		116	50-150
d5-EtFOSAA		104	50-150
d3-MeFOSAA		112	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-018	
Description: LHAAP-04WW07-111122		Matrix: Aqueous	
Date Sampled: 11/11/2022 1010	Project Name: LHAAP		
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 1951	BWS	11/16/2022 0933	60194

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U Q U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U Q U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U ~~M-03~~	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.8	U ~~M-03~~	3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS	N	310	50-150
13C2_8:2FTS	N	194	50-150
13C2_PFDoA		112	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		112	50-150
13C3_PFHxS		108	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		118	50-150
13C5_PFHxA		122	50-150
13C5_PFPeA		120	50-150
13C6_PFDA		111	50-150
13C7_PFUdA		122	50-150
13C8_PFOA		141	50-150
13C8_PFOS		114	50-150
13C9_PFNA		125	50-150
d5-EtFOSAA		130	50-150
d3-MeFOSAA		128	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK14005-019
Description: LHAAP-LHSMW01-111122
Matrix: Aqueous
Date Sampled: 11/11/2022 1055
Project Name: LHAAP
Date Received: 11/14/2022
Project Number: 30001997

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 2002	BWS	11/16/2022 0933	60194
2	SOP SPE	PFAS by ID SOP QSM B-15	5	11/18/2022 1427	BWS	11/16/2022 0933	60194

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.1	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.2		3.5	1.8	0.88	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	3.3	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	J	3.5	1.8	0.88	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	9.4		3.5	1.8	0.88	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.8	~~UM-03~~ U	3.5	1.8	0.88	ng/L	1
~~Perfluoro-n-nonanoic acid (PFNA)~~	~~375-95-1~~	~~PFAS by ID SOP~~	~~680~~	~~EM-03~~	~~3.5~~	~~1.8~~	~~0.88~~	~~ng/L~~	~~1~~
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	29	~~M-03~~ M	3.5	1.8	0.88	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	~~UM-03~~ U	3.5	1.8	0.88	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	13		3.5	1.8	0.88	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	4.8	~~M-03~~ M	3.5	1.8	0.88	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		122	50-150		128	50-150
13C2_8:2FTS		97	50-150		119	50-150
13C2_PFDoA		94	50-150		125	50-150
13C2_PFTeDA		96	50-150		118	50-150
13C3_PFBS		96	50-150		118	50-150
13C3_PFHxS		109	50-150		124	50-150
13C4_PFBA		57	50-150		108	50-150
13C4_PFHpA		98	50-150		135	50-150
13C5_PFHxA		95	50-150		123	50-150
13C5_PFPeA		95	50-150		125	50-150
13C6_PFDA		99	50-150		110	50-150
13C7_PFUdA		96	50-150		103	50-150
13C8_PFOA		92	50-150		122	50-150
13C8_PFOS		102	50-150		122	50-150
13C9_PFNA		99	50-150		124	50-150
d5-EtFOSAA		102	50-150		112	50-150
d3-MeFOSAA		104	50-150		137	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-019	
Description: LHAAP-LHSMW01-111122		Matrix: Aqueous	
Date Sampled: 11/11/2022 1055	Project Name: LHAAP		
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 2002	BWS	11/16/2022 0933	60194
2	SOP SPE	PFAS by ID SOP QSM B-15	5	11/18/2022 1427	BWS	11/16/2022 0933	60194

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	18	U	35	18	8.8	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	18	U	35	18	8.8	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	18	U	35	18	8.8	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	18	U	35	18	8.8	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.0	U	18	9.0	4.4	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	9.0	UM-03	18	9.0	4.4	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.0	U	18	9.0	4.4	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	9.0	UM-03	18	9.0	4.4	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	9.0	U	18	9.0	4.4	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	9.6	J	18	9.0	4.4	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	9.0	UM-03	18	9.0	4.4	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	700	D	18	9.0	4.4	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	25	M-03	18	9.0	4.4	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	9.0	U	18	9.0	4.4	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	9.0	U	18	9.0	4.4	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	9.0	U	18	9.0	4.4	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	11	J	18	9.0	4.4	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.0	UM-03	18	9.0	4.4	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS		122	50-150		128	50-150
13C2_8:2FTS		97	50-150		119	50-150
13C2_PFDoA		94	50-150		125	50-150
13C2_PFTeDA		96	50-150		118	50-150
13C3_PFBS		96	50-150		118	50-150
13C3_PFHxS		109	50-150		124	50-150
13C4_PFBA		57	50-150		108	50-150
13C4_PFHpA		98	50-150		135	50-150
13C5_PFHxA		95	50-150		123	50-150
13C5_PFPeA		95	50-150		125	50-150
13C6_PFDA		99	50-150		110	50-150
13C7_PFUdA		96	50-150		103	50-150
13C8_PFOA		92	50-150		122	50-150
13C8_PFOS		102	50-150		122	50-150
13C9_PFNA		99	50-150		124	50-150
d5-EtFOSAA		102	50-150		112	50-150
d3-MeFOSAA		104	50-150		137	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.
Laboratory ID: XK14005-020
Description: LHAAP-35AWW20-111122
Matrix: Aqueous
Date Sampled: 11/11/2022 1200
Project Name: LHAAP
Date Received: 11/14/2022
Project Number: 30001997

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 2012	BWS	11/16/2022 0933	60194
2	SOP SPE	PFAS by ID SOP QSM B-15	1	11/29/2022 1326	BWS	11/28/2022 1018	61078

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	~~UQ~~ U	7.5	3.8	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.8	U	7.5	3.8	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
~~Perfluoro-n-butanoic acid (PFBA)~~	~~375-22-4~~	~~PFAS by ID SOP~~	~~1.9~~	~~UQ~~	~~3.7~~	~~1.9~~	~~0.93~~	~~ng/L~~	~~1~~
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	2.3	~~JM 03~~ JM	3.7	1.9	0.93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.9	U	3.7	1.9	0.93	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS	N	215	50-150		134	50-150
13C2_8:2FTS		125	50-150		103	50-150
13C2_PFDoA		106	50-150		98	50-150
13C2_PFTeDA		109	50-150		101	50-150
13C3_PFBS		83	50-150		88	50-150
13C3_PFHxS		112	50-150		106	50-150
13C4_PFBA	N	21	50-150		57	50-150
13C4_PFHpA		94	50-150		119	50-150
13C5_PFHxA		81	50-150		92	50-150
13C5_PFPeA		50	50-150		84	50-150
13C6_PFDA		111	50-150		106	50-150
13C7_PFUdA		115	50-150		108	50-150
13C8_PFOA		119	50-150		120	50-150
13C8_PFOS		125	50-150		105	50-150
13C9_PFNA		126	50-150		95	50-150
d5-EtFOSAA		110	50-150		98	50-150
d3-MeFOSAA		104	50-150		84	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-020	
Description: LHAAP-35AWW20-111122		Matrix: Aqueous	
Date Sampled: 11/11/2022 1200	Project Name: LHAAP		
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 2012	BWS	11/16/2022 0933	60194
2	SOP SPE	PFAS by ID SOP QSM B-15	1	11/29/2022 1326	BWS	11/28/2022 1018	61078

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	20	U	40	20	10	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	20	U	40	20	10	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	20	U	40	20	10	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	20	U	40	20	10	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	10	U	20	10	5.0	ng/L	2

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_6:2FTS	N	215	50-150		134	50-150
13C2_8:2FTS		125	50-150		103	50-150
13C2_PFDoA		106	50-150		98	50-150
13C2_PFTeDA		109	50-150		101	50-150
13C3_PFBS		83	50-150		88	50-150
13C3_PFHxS		112	50-150		106	50-150
13C4_PFBA	N	21	50-150		57	50-150
13C4_PFHpA		94	50-150		119	50-150
13C5_PFHxA		81	50-150		92	50-150
13C5_PFPeA		50	50-150		84	50-150
13C6_PFDA		111	50-150		106	50-150
13C7_PFUdA		115	50-150		108	50-150
13C8_PFOA		119	50-150		120	50-150
13C8_PFOS		125	50-150		105	50-150
13C9_PFNA		126	50-150		95	50-150
d5-EtFOSAA		110	50-150		98	50-150
d3-MeFOSAA		104	50-150		84	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

PFAS by LC/MS/MS

Client: Arcadis U.S., Inc.		Laboratory ID: XK14005-021	
Description: LHAAP-35AWW16-111122		Matrix: Aqueous	
Date Sampled: 11/11/2022 1325	Project Name: LHAAP		
Date Received: 11/14/2022	Project Number: 30001997		

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	11/17/2022 2023	BWS	11/16/2022 0933	60194

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	6.9	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	1.7	~~UM-03~~ U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	1.7	U	3.4	1.7	0.86	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_6:2FTS		102	50-150
13C2_8:2FTS		96	50-150
13C2_PFDoA	M-03	93	50-150
13C2_PFTeDA		108	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		111	50-150
13C4_PFBA	M-03	50	50-150
13C4_PFHpA		105	50-150
13C5_PFHxA		116	50-150
13C5_PFPeA		99	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		106	50-150
13C8_PFOA		102	50-150
13C8_PFOS		106	50-150
13C9_PFNA		107	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Client ID: 1067 - Pace Analytical Services
SDG: 222111623
PM: RWe

Chain of Custody

Pace Analytical

Workorder: XK14005 Workorder Name: LHAAP Owner Received Date: 11/14/2022 Results Requested By: 11/30/2022

Report To:	Subcontract To:
Kathy E. Smith	Project #
Pace Analytical	
106 Vantage Point Drive	Pace Gulf Coast
Columbia SC, 29223	7979 Innovation Park Drive,
803-227-2704	Baton Rouge, LA 70820
Kathy.Smith@pacelabs.com	

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: TOC - 9060	LAB USE ONLY
1								
2	LHAAP-BG3-SO-01	grab	11/10/2022 @1115	XK14005-003	Solid		X	1
3	LHAAP-PA2-SO-01	grab	11/10/2022 @1520	XK14005-015	Solid		X	2
4								
5								
6								
7								
8								
9								
10								

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	FedEx	11/14/22 1900			
2		11/10/22 9:47		11/10/22 9:47	
3					

Cooler Temperature on Receipt _____ °C | Custody Seal (Y) or N | Received on Ice (Y) or N | Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC. This chain of custody is considered complete as is since this information is available in the owner laboratory. 2.7 E35 663 3468 3061

Friday, June 17, 2016 11:01:34 AM FMT-ALL-C-002rev.00 24March2009 Page 1 of 1

Report#: 222111623
Project ID: XK14005 LHAAP **Report Date:** 12/04/2022

Sample Results

LHAAP-BG3-SO-01

Collect Date	11/10/2022 11:15	**Lab ID**	22211162301
Receive Date	11/16/2022 09:47	**Matrix**	Solid

EPA 9060A

*Results are reported on a dry weight basis.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	1	11/28/22 11:03	754718	JGD	NA

CAS#	Parameter	Result	DL	LOQ	Units
C-012	Total Organic Carbon	1070 J	153	250	mg/kg

LHAAP-PA2-SO-02-111022

~~LHAAP-PA2-SO-01~~

Collect Date	11/10/2022 15:20	**Lab ID**	22211162302
Receive Date	11/16/2022 09:47	**Matrix**	Solid

EPA 9060A

*Results are reported on a dry weight basis.

Prep Date	Prep Batch	Prep Method	Dilution	Run Date	Run Batch	Analyst	%Moisture
NA	NA	NA	1	11/28/22 12:39	754718	JGD	NA

CAS#	Parameter	Result	DL	LOQ	Units
C-012	Total Organic Carbon	560	153	250	mg/kg

Arcadis U.S., Inc.
10205 Westheimer Road, Suite 800
Houston
Texas 77042
Phone: 713 953 4800
www.arcadis.com

APPENDIX M

Site Inspection Laboratory Analytical Results

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Old and New Fire Stations (Buildings 709 and 710)		Old and New Fire Stations (Buildings 709 and 710)		Old and New Fire Stations (Buildings 709 and 710)		Old and New Fire Stations (Buildings 709 and 710)	
			Location	LHAAP-LHSMW01		LHAAP-ONFS-GW-01		LHAAP-ONFS-GW-02		LHAAP-ONFS-GW-03	
			Sample/Duplicate ID	LHAAP-LHSMW01-111122		LHAAP-ONFS-GW-01-112822		LHAAP-ONFS-GW-02-111622		LHAAP-ONFS-GW-03-111622	
			Sample Date	11/11/2022		11/28/2022		11/16/2022		11/16/2022	
			Sample Type	N		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.1	U	6.7	U	**36**	J-	**17**	
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.1	U	6.7	U	8.6	U	8	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.1	U	6.7	UJ	8.6	U	8	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.1	U	6.7	UJ	8.6	UJ	8	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.5	U	3.4	U	**6.5**		**2.2**	J
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	**3.3**	J	3.4	U	**79**		**56**	
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	**1.9**	J	3.4	U	4.3	U	4	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.5	U		R	4.3	U	4	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	**9.4**		3.4	U	**30**		**26**	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	**5.2**		3.4	U	**5.7**		**2.2**	J
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.5	U	3.4	U	**42**		**28**	
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	**700**		**5.6**		**18**		**24**	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	**4.8**		**11**	J+	4.3	U	**4.4**	
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**29**		**25**		**160**		**33**	
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.5	U	3.4	U	**50**		**36**	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.5	U		R	4.3	U	4	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.5	U		R	4.3	U	4	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	**13**		3.4	UJ	4.3	U	4	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

AOPI				Old and New Fire Stations (Buildings 709 and 710)		Building 744-A Vehicle Wash Rack (LHAAP-056)		Building 744-A Vehicle Wash Rack (LHAAP-056)		Building 744-A Vehicle Wash Rack (LHAAP-056)	
Location				LHAAP-ONFS-GW-04		LHAAP-35AWW06		LHAAP-35AWW06		LHAAP-35AWW16	
Sample/Duplicate ID				LHAAP-ONFS-GW-04-112822		LHAAP-35AWW06-111422		LHAAP-35AWW06-111422 / LHAAP-FD-1-111422		LHAAP-35AWW16-111122	
Sample Date				11/28/2022		11/14/2022		11/14/2022		11/11/2022	
Sample Type				N		N		FD		N	
Matrix				Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	**5.3**	J	7.3	U	7	U	6.9	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7	U	7.3	U	7	U	6.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7	U	7.3	U	7	U	6.9	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7	U	7.3	U	7	U	6.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	**5.4**		3.7	U	3.5	U	3.4	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	**3**	J	3.7	U	3.5	U	3.4	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**17**		3.7	U	3.5	U	3.4	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.5	U	3.7	U	3.5	U	3.4	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Building 744-A Vehicle Wash Rack (LHAAP-056)		Plant Area 2 (LHAAP-046)		Plant Area 2 (LHAAP-046)		Plant Area 2 (LHAAP-046)	
			Location	LHAAP-35AWW20		LHAAP-LHSMW19		LHAAP-LHSMW21		LHAAP-LHSMW23R	
			Sample/Duplicate ID	LHAAP-35AWW20-111122		LHAAP-LHSMW19-111222		LHAAP-LHSMW21-111222		LHAAP-LHSMW23R-112822	
			Sample Date	11/11/2022		11/12/2022		11/12/2022		11/28/2022	
			Sample Type	N		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.5	U	7.9	U	7.8	U	7.6	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.5	U	7.9	U	7.8	U	7.6	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.5	U	7.9	U	7.8	U	7.6	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.5	U	7.9	U	7.8	U	7.6	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.7	U	**2.6**	J	3.9	U	3.8	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	20	U	3.9	U	3.9	U		R
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.7	U	**2.6**	J	3.9	U	3.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**2.3**	J	3.9	U	3.9	U	3.8	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.7	U	3.9	U	3.9	U	**2**	J+
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.7	U	3.9	U	3.9	U	3.8	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Plant Area 2 (LHAAP-046)		Plant Area 2 (LHAAP-046)		Plant Area 2 (LHAAP-046)		Plant Area 3 (LHAAP-047)	
			Location	LHAAP-LHSMW25R		LHAAP-46WW02		LHAAP-46WW06		LHAAP-LHSMW41	
			Sample/Duplicate ID	LHAAP-LHSMW25R-112822		LHAAP-46WW02-113022		LHAAP-46WW06-112822		LHAAP-LHSMW41-112922	
			Sample Date	11/28/2022		11/30/2022		11/28/2022		11/29/2022	
			Sample Type	N		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7	U	7.5	U	7.3	U	7.5	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7	U	7.5	U	7.3	U	7.5	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7	U	7.5	U	7.3	U	7.5	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7	U	7.5	U	7.3	U	7.5	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	3.5	U	3.8	UJ	3.6	U	3.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.5	UJ	**2.4**	J	3.6	U	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.5	U	**4.4**		3.6	U	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.5	U	**17**		3.6	U	3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	3.5	U	**29**		3.6	U	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.5	U	3.8	UJ	3.6	U	3.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.5	U	3.8	U	3.6	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.5	U	3.8	U	3.6	U	3.7	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)	
			Location	LHAAP-LHSMW44		LHAAP-LHSMW45		LHAAP-LHSMW54		LHAAP-LHSMW54	
			Sample/Duplicate ID	LHAAP-LHSMW44-112922		LHAAP-LHSMW45-113022		LHAAP-LHSMW54-112922		LHAAP-LHSMW54-112922 / LHAAP-FD-4-GW-112922	
			Sample Date	11/29/2022		11/30/2022		11/29/2022		11/29/2022	
			Sample Type	N		N		N		FD	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.1	U	7.7	U	7.5	U	7.5	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.1	U	7.7	U	7.5	U	7.5	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.1	U	7.7	U	7.5	U	7.5	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.1	U	7.7	U	7.5	U	7.5	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	3.6	U	**3.6**	J	**3.6**	J	**3.7**	J
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.6	U	**2.3**	J	**2**	J	**2**	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.6	U	3.9	U	3.7	U	3.8	U

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SI Laboratory Analytical Results - Groundwater
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			AOPI	Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)	
			Location	LHAAP-LHSMW56R		LHAAP-35BWW07		LHAAP-35BWW07		LHAAP-47WW19	
			Sample/Duplicate ID	LHAAP-LHSMW56R-112922		LHAAP-35BWW07-112922		LHAAP-35BWW07-112922 / LHAAP-FD-3-GW-112922		LHAAP-47WW19-113022	
			Sample Date	11/29/2022		11/29/2022		11/29/2022		11/30/2022	
			Sample Type	N		N		FD		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.1	U	7.5	U	7.3	U	7.3	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.1	U	7.5	U	7.3	U	7.3	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.1	U	7.5	U	7.3	U	7.3	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.1	U	7.5	U	7.3	U	7.3	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	**5.3**		3.7	U	3.7	U	3.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	**1.9**	J	3.7	U	3.7	U	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	**2.1**	J	3.7	U	3.7	U	3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**85**		3.7	U	3.7	U	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	**3.4**	J	3.7	U	3.7	U	3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.6	U	3.7	U	3.7	U	3.7	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.6	U	3.7	U	3.7	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.6	U	3.7	U	3.7	U	3.7	U

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			AOPI	Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)	
			Location	LHAAP-47WW42		LHAAP-47WW42		LHAAP-47WW48		LHAAP-47WW49	
			Sample/Duplicate ID	LHAAP-47WW42-113022		LHAAP-47WW42-113022 / LHAAP-FD-2-GW-113022		LHAAP-47WW48-112922		LHAAP-47WW49-113022	
			Sample Date	11/30/2022		11/30/2022		11/29/2022		11/30/2022	
			Sample Type	N		FD		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.3	U	7.6	U	7.1	U	**5.8**	J-
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.3	U	7.6	U	7.1	U	11	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.3	U	7.6	U	7.1	U	11	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.3	U	7.6	U	7.1	U	11	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.7	U	3.8	U	3.6	U	5.4	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	**8.2**	J-	**3.9**		**28**		**81**	
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.7	U	3.8	U	3.6	U	5.4	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.7	U	3.8	U	3.6	UJ	5.4	UJ
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	**2**	J	3.8	U	**3.7**		**5.4**	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.7	U	3.8	U	3.6	U	5.4	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	**2.7**	J	3.8	U	**4.3**		**9.9**	
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.7	U	3.8	U	3.6	U	5.4	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.7	U	3.8	U	3.6	U	5.4	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**6.2**		**5.3**		**2.5**	J	5.4	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	**4.4**		**2**	J	**22**		**52**	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.7	U	3.8	U	3.6	UJ	5.4	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.7	U	3.8	U	3.6	UJ	5.4	UJ
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.7	U	3.8	U	3.6	U	5.4	U

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			AOPI	Pilot Wastewater Treatment Plant (LHAAP-004)		Pilot Wastewater Treatment Plant (LHAAP-004)		Pilot Wastewater Treatment Plant (LHAAP-004)		Former Waste Disposal Facility (LHAAP-050)	
			Location	LHAAP-04WW01		LHAAP-04WW07		LHAAP-04WW08		LHAAP-50WW12	
			Sample/Duplicate ID	LHAAP-04WW01-111122		LHAAP-04WW07-111122		LHAAP-04WW08-010523		LHAAP-50WW12-111422	
			Sample Date	11/11/2022		11/11/2022		01/05/2023		11/14/2022	
			Sample Type	N		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.6	U	7.2	U	7.7	U	7.5	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.6	U	7.2	U	7.7	U	7.5	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.6	U	7.2	U	7.7	U	7.5	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.6	U	7.2	U	7.7	U	7.5	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.8	U	3.6	U	7.7	U	3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.8	U	3.6	U	3.9	U	3.7	U

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			AOPI	Former Waste Disposal Facility (LHAAP-050)		Building 811-1 Hazardous Waste Storage Area (LHAAP-045)		Building 811-1 Hazardous Waste Storage Area (LHAAP-045)		Building 31-W Container Storage Area (LHAAP-009)	
			Location	LHAAP-50WW13		LHAAP-HWSA-GW-01		LHAAP-HWSA-GW-01		LHAAP-CSA-GW-01	
			Sample/Duplicate ID	LHAAP-50WW13-111422		LHAAP-HWSA-GW-01-112922		LHAAP-HWSA-GW-01-112922 / LHAAP-FD-6-GW-112922		LHAAP-CSA-GW-01-112922	
			Sample Date	11/14/2022		11/29/2022		11/29/2022		11/29/2022	
			Sample Type	N		N		FD		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	6.9	U	8	UJ	11	UJ	7.6	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	6.9	U	8	UJ	11	UJ	7.6	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	6.9	U	8	UJ	11	UJ	7.6	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	6.9	U	8	UJ	11	UJ	7.6	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**22**		4	UJ	5.3	UJ	3.8	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.4	U		R		R	3.8	UJ
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.4	U	4	UJ	5.3	UJ	3.8	U

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			AOPI	Building 31-W Container Storage Area (LHAAP-009)		Burning Ground No. 3 (LHAAP-018)		Burning Ground No. 3 (LHAAP-018)		Burning Ground No. 3 (LHAAP-018)	
			Location	LHAAP-CSA-GW-01		LHAAP-120		LHAAP-18CPTMW04		LHAAP-18CPTMW23	
			Sample/Duplicate ID	LHAAP-CSA-GW-01-112922 / LHAAP-FD-5-GW-112922		LHAAP-120-111522		LHAAP-18CPTMW04-111622		LHAAP-18CPTMW23-111522	
			Sample Date	11/29/2022		11/15/2022		11/16/2022		11/15/2022	
			Sample Type	FD		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7.4	U	7.6	U	7.3	UJ-	6.9	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7.4	U	7.6	U	7.3	UJ-	6.9	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7.4	U	7.6	U	7.3	UJ-	6.9	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7.4	U	7.6	U	7.3	UJ-	6.9	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.7	U	3.8	U	**3.5**	J-	3.5	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	3.7	U	3.8	UJ	**3.9**	J-	3.5	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.7	U	3.8	U	3.7	UJ-	3.5	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.7	U	3.8	U	3.7	UJ-	3.5	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.7	U	3.8	U	**4.5**	J-	3.5	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.7	U	3.8	U	**2.4**	J-	3.5	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.7	U	3.8	U	**3.8**	J-	3.5	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.7	U	3.8	U	3.7	UJ-	3.5	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.7	U	**3.4**	J	**2.8**	J-	3.5	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	3.7	U	**7.1**		**22**	J-	**5.2**	
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.7	U	3.8	U	**2.4**	J-	3.5	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.7	U	3.8	U	3.7	UJ-	3.5	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.7	U	3.8	U	3.7	UJ-	3.5	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.7	U	3.8	U	3.7	UJ-	3.5	U

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			AOPI	Unlined Evaporation Pond (LHAAP-024)		Unlined Evaporation Pond (LHAAP-024)		Unlined Evaporation Pond (LHAAP-024)		Landfill 12 (LHAAP-012)	
			Location	LHAAP-MW1		LHAAP-MW2		LHAAP-MW3		LHAAP-12WW01	
			Sample/Duplicate ID	LHAAP-MW1-111522		LHAAP-MW2-111622		LHAAP-MW3-111622		LHAAP-12WW01-111522	
			Sample Date	11/15/2022		11/16/2022		11/16/2022		11/15/2022	
			Sample Type	N		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	**7.9**		6.6	U	7.5	U	7.1	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7	U	6.6	U	7.5	U	7.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7	U	6.6	U	7.5	U	7.1	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7	U	6.6	U	7.5	U	7.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	**9.5**		**11**		**1.9**	J	3.5	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	**5.7**		**4.6**		**4.1**		**7.7**	J+
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.5	U	3.3	U	3.8	U	3.5	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.5	U	3.3	U	3.8	U	3.5	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	**5.4**		**5.5**		3.8	U	**5.3**	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	**2.2**	J	**5.3**		**5.6**		3.5	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	**4.3**		**5.4**		**1.9**	J	**4.2**	
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.5	U	3.3	U	3.8	U	3.5	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	**2.9**	J	**29**		**42**		3.5	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**23**		**24**		**9.3**		**17**	
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	**3.8**		3.3	U	3.8	U	**2.4**	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.5	U	3.3	U	3.8	U	3.5	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.5	U	3.3	U	3.8	U	3.5	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.5	U	3.3	U	3.8	U	3.5	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Landfill 12 (LHAAP-012)		Landfill 12 (LHAAP-012)		Landfill 16 (LHAAP-016)		Landfill 16 (LHAAP-016)	
			Location	LHAAP-12WW02		LHAAP-12WW24		LHAAP-16WW13		LHAAP-16WW16	
			Sample/Duplicate ID	LHAAP-12WW02-111522		LHAAP-12WW24-111622		LHAAP-16WW13-111622		LHAAP-16WW16-111622	
			Sample Date	11/15/2022		11/16/2022		11/16/2022		11/16/2022	
			Sample Type	N		N		N		N	
			Matrix	Ground Water		Ground Water		Ground Water		Ground Water	
Analyte	CAS	OSD Tapwater	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	7	U	7	UJ-	7.3	U	7.5	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	7	U	7	UJ-	7.3	U	7.5	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	7	U	7	UJ-	7.3	U	7.5	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	7	U	7	UJ-	7.3	U	7.5	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	**13**		**3.3**	J-	**3.5**	J+	**2.4**	J
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	3.5	U	3.5	UJ-	**7.2**		3.8	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	3.5	U	3.5	UJ-	**4.6**		3.8	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	3.5	U	**2.2**	J-	**4.2**		**3**	J
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	3.5	U	3.5	UJ-	**8.2**		3.8	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**3.8**		**10**	J-	**620**		**2.1**	J
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	3.5	U	3.5	UJ-	**5.5**		**2.6**	J
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	3.5	U	3.5	UJ-	3.6	U	3.8	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Landfill 16 (LHAAP-016)	
			Location	LHAAP-16WW36	
			Sample/Duplicate ID	LHAAP-16WW36-111622	
			Sample Date	11/16/2022	
			Sample Type	N	
			Matrix	Ground Water	
Analyte	**CAS**	**OSD Tapwater**	**Units**	**Result**	**Qual**
PFAS					
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	ng/L	80	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	ng/L	80	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	ng/L	80	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	ng/L	80	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	601	ng/L	40	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	ng/L	40	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	ng/L	40	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	ng/L	40	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	ng/L	40	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	39	ng/L	40	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	ng/L	40	U
Perfluorononanoic acid (PFNA)	375-95-1	6	ng/L	40	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	4	ng/L	40	U
Perfluorooctanoic acid (PFOA)	335-67-1	6	ng/L	**95**	
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	ng/L	40	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	ng/L	40	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	ng/L	40	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	ng/L	40	U

Appendix M
SI Laboratory Analytical Results - Groundwater
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Notes:
1. **Bolded** values indicate the result was detected greater than the limit of detection.
2. Gray shaded values indicate the result was detected greater than the 2022 Office of the Secretary of Defense (OSD) risk screening levels, (OSD. 2022. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. July).

Acronyms/Abbreviations:
-- = not applicable
% = percent
AOPI = area of potential interest
CAS = Chemical Abstracts Service number
FD = field duplicate sample
ID = identification
N = primary sample
ng/L = nanograms per liter (parts per trillion)
PFAS = per- and polyfluoroalkyl substances

Qualifier	Description
J	The analyte was positively identified; however the associated numerical value is an estimated concentration only.
J+	The result is an estimated quantity; the result may be biased high.
J-	The result is an estimated quantity; the result may be biased low.
R	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Rejection of the data was decided by the project team and USACE chemist.
U	The analyte was analyzed for but the result was not detected above the limit of quantitation (LOQ).
UJ	The analyte was analyzed for but was not detected. The reported LOQ is approximate and may be inaccurate or imprecise.
UJ-	The analyte was analyzed for but was not detected. The reported LOQ is approximate and may be inaccurate or imprecise.

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

AOPI				Old and New Fire Stations (Buildings 709 and 710)						Old and New Fire Stations (Buildings 709 and 710)						Building 744-A Vehicle Wash Rack (LHAAP-056)			
Location				LHAAP-ONFS-SO-01		LHAAP-ONFS-SO-02		LHAAP-ONFS-SO-03		LHAAP-ONFS-SO-04		LHAAP-ONFS-SO-05		LHAAP-ONFS-SO-06		LHAAP-VWR-SO-01		LHAAP-VWR-SO-02	
Sample/Duplicate ID				LHAAP-ONFS-SO-01-111522		LHAAP-ONFS-SO-02-111522		LHAAP-ONFS-SO-03-111522		LHAAP-ONFS-SO-04-111522		LHAAP-ONFS-SO-05-110822		LHAAP-ONFS-SO-06-110822		LHAAP-VWR-SO-01-110822		LHAAP-VWR-SO-02-110822	
Sample Date				11/15/2022		11/15/2022		11/15/2022		11/15/2022		11/08/2022		11/08/2022		11/08/2022		11/08/2022	
Sample Type				N		N		N		N		N		N		N		N	
Matrix				Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	CAS	OSD Risk Screening Level	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS																			
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.0023	U	0.0021	U	0.0021	U	0.0019	U	0.0021	U	0.0021	U	0.002	U	0.0019	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.0023	U	0.0021	U	0.0021	U	0.0019	U	0.0021	U	0.0021	U	0.002	U	0.0019	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.0023	U	0.0021	U	0.0021	U	0.0019	U	0.0021	U	0.0021	U	0.002	U	0.0019	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.0023	U	0.0021	U	0.0021	U	0.0019	U	0.0021	U	0.0021	U	0.002	U	0.0019	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	**0.00057**	J	0.001	U	0.00096	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	**0.0011**		0.001	U	0.00096	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	**0.0022**		0.001	U	0.00096	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.0012	U	**0.0013**		0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	0.001	U	0.001	U	0.00096	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.0012	U	0.001	U	0.0011	U	0.00096	U	0.0011	U	**0.031**		0.001	U	0.00096	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	**0.00082**	J	**0.00052**	J	0.0011	U	0.00096	U	0.0011	U	**0.096**		0.001	U	0.00096	U
TOC																			
Total Organic Carbon	--	--	mg/kg	**2400**															
Grain Size																			
Clay	--	--	%	**5.4**															
Gravel	--	--	%	**0**															
Sand	--	--	%	**36.8**															
Sieve No. 200, % passing	--	--	%	**63.2**															
Sieve No. 4, % passing	--	--	%	**0**															
Silt	--	--	%	**57.8**															
General Chemistry																			
pH	--	--	SU	**5.9**	J														

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

AOPI				Building 744-A Vehicle Wash Rack (LHAAP-056)		Building 744-A Vehicle Wash Rack (LHAAP-056)		Plant Area 2 (LHAAP-046)		Plant Area 2 (LHAAP-046)		Plant Area 2 (LHAAP-046)						Plant Area 2 (LHAAP-046)	
Location				LHAAP-VWR-SO-02		LHAAP-VWR-SO-03		LHAAP-PA2-SO-01		LHAAP-PA2-SO-01		LHAAP-PA2-SO-02		LHAAP-PA2-SO-03		LHAAP-PA2-SO-04		LHAAP-PA2-SO-05	
Sample/Duplicate ID				LHAAP-VWR-SO-02-110822 / LHAAP-FD-1-SO-110822		LHAAP-VWR-SO-03-111422		LHAAP-PA2-SO-01-111022		LHAAP-PA2-SO-01-111522		LHAAP-PA2-SO-02-111022		LHAAP-PA2-SO-03-111522		LHAAP-PA2-SO-04-111522		LHAAP-PA2-SO-05-111522	
Sample Date				11/08/2022		11/14/2022		11/10/2022		11/15/2022		11/10/2022		11/15/2022		11/15/2022		11/15/2022	
Sample Type				FD		N		N		N		N		N		N		N	
Matrix				Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	**CAS**	**OSD Risk Screening Level**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS																			
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.002	U	0.0021	U			0.0025	U	0.002	U	0.002	U	0.0023	U	0.0025	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.002	U	0.0021	U			0.0025	U	0.002	U	0.002	U	0.0023	U	0.0025	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.002	U	0.0021	U			0.0025	U	0.002	U	0.002	U	0.0023	U	0.0025	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.002	U	0.0021	U			0.0025	U	0.002	U	0.002	U	0.0023	U	0.0025	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	0.00099	U	0.001	U			0.0013	U	0.001	U	0.00098	U	0.0011	U	0.0013	U
TOC																			
Total Organic Carbon	--	--	mg/kg									**560**							
Grain Size																			
Clay	--	--	%					**1**											
Gravel	--	--	%					**0**											
Sand	--	--	%					**52.1**											
Sieve No. 200, % passing	--	--	%					**47.9**											
Sieve No. 4, % passing	--	--	%					**0**											
Silt	--	--	%					**46.9**											
General Chemistry																			
pH	--	--	SU									**6.6**	J						

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

AOPI				Plant Area 2 (LHAAP-046)				Plant Area 2 (LHAAP-046)						Plant Area 2 (LHAAP-046)					
Location				LHAAP-PA2-SO-06		LHAAP-PA2-SO-07		LHAAP-PA2-SO-08		LHAAP-PA2-SO-09		LHAAP-PA2-SO-10		LHAAP-PA2-SO-11		LHAAP-PA2-SO-12		LHAAP-PA2-SO-13	
Sample/Duplicate ID				LHAAP-PA2-SO-06-111022		LHAAP-PA2-SO-07-111122		LHAAP-PA2-SO-08-111122		LHAAP-PA2-SO-09-111122		LHAAP-PA2-SO-10-111122		LHAAP-PA2-SO-11-111022		LHAAP-PA2-SO-12-111022		LHAAP-PA2-SO-13-111022	
Sample Date				11/10/2022		11/11/2022		11/11/2022		11/11/2022		11/11/2022		11/10/2022		11/10/2022		11/10/2022	
Sample Type				N		N		N		N		N		N		N		N	
Matrix				Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	CAS	OSD Risk Screening Level	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS																			
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.0024	U	0.0021	U	0.0022	U	0.0023	U	0.0024	U	0.0021	U	0.0023	U	0.0022	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.0024	U	0.0021	U	0.0022	U	0.0023	U	0.0024	U	0.0021	U	0.0023	U	0.0022	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.0024	U	0.0021	U	0.0022	U	0.0023	U	0.0024	U	0.0021	U	0.0023	U	0.0022	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.0024	U	0.0021	U	0.0022	U	0.0023	U	0.0024	U	0.0021	U	0.0023	U	0.0022	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.0012	U	0.001	U	0.0011	U	0.0011	U
TOC																			
Total Organic Carbon	--	--	mg/kg																
Grain Size																			
Clay	--	--	%																
Gravel	--	--	%																
Sand	--	--	%																
Sieve No. 200, % passing	--	--	%																
Sieve No. 4, % passing	--	--	%																
Silt	--	--	%																
General Chemistry																			
pH	--	--	SU																

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

AOPI				Plant Area 3 (LHAAP-047)						Plant Area 3 (LHAAP-047)						Plant Area 3 (LHAAP-047)			
Location				LHAAP-PA3-SO-01		LHAAP-PA3-SO-01		LHAAP-PA3-SO-02		LHAAP-PA3-SO-03		LHAAP-PA3-SO-04		LHAAP-PA3-SO-04		LHAAP-PA3-SO-05		LHAAP-PA3-SO-06	
Sample/Duplicate ID				LHAAP-PA3-SO-01-110922		LHAAP-PA3-SO-01-112822		LHAAP-PA3-SO-02-110922		LHAAP-PA3-SO-03-110922		LHAAP-PA3-SO-04-110922		LHAAP-PA3-SO-04-112822		LHAAP-PA3-SO-05-110922		LHAAP-PA3-SO-06-110922	
Sample Date				11/09/2022		11/28/2022		11/09/2022		11/09/2022		11/09/2022		11/28/2022		11/09/2022		11/09/2022	
Sample Type				N		N		N		N		N		N		N		N	
Matrix				Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	CAS	OSD Risk Screening Level	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS																			
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.0023	U			**0.0011**	J	0.0021	U	0.0021	U	0.0023	U	0.0022	U	0.0019	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.0023	U			0.0019	U	0.0021	U	0.0021	U	0.0023	UJ	0.0022	U	0.0019	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.0023	U			0.0019	U	0.0021	U	0.0021	U	0.0023	U	0.0022	U	0.0019	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.0023	U			0.0019	U	0.0021	U	0.0021	U	0.0023	U	0.0022	U	0.0019	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0011	U			0.00096	U	0.0011	U	**0.0014**		**0.0011**		0.0011	U	0.00095	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	0.0011	U			0.00096	U	0.0011	U	0.001	U	0.0011	U	0.0011	U	0.00095	U
TOC																			
Total Organic Carbon	--	--	mg/kg																
Grain Size																			
Clay	--	--	%			**29.9**													
Gravel	--	--	%			**0**													
Sand	--	--	%			**16.1**													
Sieve No. 200, % passing	--	--	%			**83.9**													
Sieve No. 4, % passing	--	--	%			**0**													
Silt	--	--	%			**54**													
General Chemistry																			
pH	--	--	SU			**6**													

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Plant Area 3 (LHAAP-047)		Plant Area 3 (LHAAP-047)					Plant Area 3 (LHAAP-047)						Former Waste Disposal Facility (LHAAP-050)	
			Location	LHAAP-PA3-SO-07		LHAAP-PA3-SO-08		LHAAP-PA3-SO-09		LHAAP-PA3-SO-09	LHAAP-PA3-SO-10		LHAAP-PA3-SO-11		LHAAP-PA3-SO-12		LHAAP-FWDF-SO-01	
			Sample/Duplicate ID	LHAAP-PA3-SO-07-111422		LHAAP-PA3-SO-08-110822		LHAAP-PA3-SO-09-110822		LHAAP-PA3-SO-09-110822 / LHAAP-FD-2-SO-110922	LHAAP-PA3-SO-10-110822		LHAAP-PA3-SO-11-110922		LHAAP-PA3-SO-12-110922		LHAAP-FWDF-SO-01-111122	
			Sample Date	11/14/2022		11/08/2022		11/08/2022		11/09/2022	11/08/2022		11/09/2022		11/09/2022		11/11/2022	
			Sample Type	N		N		N		FD	N		N		N		N	
			Matrix	Soil		Soil		Soil		Soil	Soil		Soil		Soil		Soil	
Analyte	CAS	OSD Risk Screening Level	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS																			
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.0019	U	0.0021	U	0.0019	U	0.0023	U	0.0024	U	0.0022	U	0.0021	U	0.002	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.0019	U	0.0021	U	0.0019	U	0.0023	U	0.0024	U	0.0022	U	0.0021	U	0.002	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.0019	U	0.0021	U	0.0019	U	0.0023	U	0.0024	U	0.0022	U	0.0021	U	0.002	UJ
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.0019	U	0.0021	U	0.0019	U	0.0023	U	0.0024	U	0.0022	U	0.0021	U	0.002	UJ
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	UJ
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	0.00097	U	0.0011	U	0.00094	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.001	U
TOC																			
Total Organic Carbon	--	--	mg/kg																
Grain Size																			
Clay	--	--	%																
Gravel	--	--	%																
Sand	--	--	%																
Sieve No. 200, % passing	--	--	%																
Sieve No. 4, % passing	--	--	%																
Silt	--	--	%																
General Chemistry																			
pH	--	--	SU																

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			AOPI	Former Waste Disposal Facility (LHAAP-050)				Building 811-1 Hazardous Waste Storage Area (LHAAP-045)						Building 811-1 Hazardous Waste Storage Area (LHAAP-045)		Building 31-W Container Storage Area (LHAAP-009)			
			Location	LHAAP-FWDF-SO-02		LHAAP-FWDF-SO-03		LHAAP-HWSA-SO-01		LHAAP-HWSA-SO-01		LHAAP-HWSA-SO-02		LHAAP-HWSA-SO-03		LHAAP-CSA-SO-01		LHAAP-CSA-SO-02	
			Sample/Duplicate ID	LHAAP-FWDF-SO-02-110922		LHAAP-FWDF-SO-03-110922		LHAAP-HWSA-SO-01-111222		LHAAP-HWSA-SO-01-112922		LHAAP-HWSA-SO-02-111222		LHAAP-HWSA-SO-03-111222		LHAAP-CSA-SO-01-111422		LHAAP-CSA-SO-02-111422	
			Sample Date	11/09/2022		11/09/2022		11/12/2022		11/29/2022		11/12/2022		11/12/2022		11/14/2022		11/14/2022	
			Sample Type	N		N		N		N		N		N		N		N	
			Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	CAS	OSD Risk Screening Level	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS																			
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.0024	U	0.0021	U	0.0021	U			0.0021	U	0.0021	U	0.0021	U	0.0022	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.0024	U	0.0021	U	0.0021	U			0.0021	U	0.0021	U	0.0021	U	0.0022	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.0024	U	0.0021	U	0.0021	U			0.0021	U	0.0021	U	0.0021	U	0.0022	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.0024	U	0.0021	U	0.0021	U			0.0021	U	0.0021	U	0.0021	U	0.0022	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	0.0012	U	0.0011	U	0.0011	U			0.001	U	0.0011	U	0.0011	U	0.0011	U
TOC																			
Total Organic Carbon	--	--	mg/kg					**1940**		**1690**								**349**	
Grain Size																			
Clay	--	--	%					**6.5**		**11**								**12**	
Gravel	--	--	%					**11.2**		**2.9**								**0.6**	
Sand	--	--	%					**45.6**		**50.4**								**46.4**	
Sieve No. 200, % passing	--	--	%					**43.2**		**46.7**								**53**	
Sieve No. 4, % passing	--	--	%					**11.2**		**2.9**								**0.6**	
Silt	--	--	%					**36.7**		**35.7**								**41**	
General Chemistry																			
pH	--	--	SU					**5.4**	J									**5.4**	J

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

AOPI				Building 31-W Container Storage Area (LHAAP-009)				Burning Ground No. 3									
Location				LHAAP-CSA-SO-02		LHAAP-CSA-SO-03		LHAAP-BG3-SO-01		LHAAP-BG3-SO-02		LHAAP-BG3-SO-03		LHAAP-BG3-SO-04		LHAAP-BG3-SO-05	
Sample/Duplicate ID				LHAAP-CSA-SO-02-111422 / LHAAP-FD-3-SO-111422		LHAAP-CSA-SO-03-111422		LHAAP-BG3-SO-01-111022		LHAAP-BG3-SO-02-111022		LHAAP-BG3-SO-03-111022		LHAAP-BG3-SO-04-111022		LHAAP-BG3-SO-05-111022	
Sample Date				11/14/2022		11/14/2022		11/10/2022		11/10/2022		11/10/2022		11/10/2022		11/10/2022	
Sample Type				FD		N		N		N		N		N		N	
Matrix				Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Analyte	CAS	OSD Risk Screening Level	Units	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS																	
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	--	mg/kg	0.0022	U	0.0024	U	0.0023	U	0.0023	U	0.0023	U	0.0023	U	0.0019	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	--	mg/kg	0.0022	U	0.0024	U	0.0023	U	0.0023	U	0.0023	U	0.0023	U	0.0019	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	--	mg/kg	0.0022	U	0.0024	U	0.0023	U	0.0023	U	0.0023	U	0.0023	U	0.0019	U
N-Methylperfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	--	mg/kg	0.0022	U	0.0024	U	0.0023	U	0.0023	U	0.0023	U	0.0023	U	0.0019	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1.9 (R) 25 (I/C)	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorobutanoic acid (PFBA)	375-22-4	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorodecanoic acid (PFDA)	335-76-2	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorododecanoic acid (PFDoA)	307-55-1	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.13 (R) 1.6 (I/C)	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorononanoic acid (PFNA)	375-95-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.013 (R) 0.16 (I/C)	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorooctanoic acid (PFOA)	335-67-1	0.019 (R) 0.25 (I/C)	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	--	mg/kg	0.0011	U	0.0012	U	0.0012	U	0.0011	U	0.0011	U	0.0011	U	0.00097	U
TOC																	
Total Organic Carbon	--	--	mg/kg					**1070**									
Grain Size																	
Clay	--	--	%					**21.2**									
Gravel	--	--	%					**6**									
Sand	--	--	%					**43.5**									
Sieve No. 200, % passing	--	--	%					**50.5**									
Sieve No. 4, % passing	--	--	%					**6**									
Silt	--	--	%					**29.3**									
General Chemistry																	
pH	--	--	SU					**7.8**	J								

Appendix M
SI Laboratory Analytical Results - Soil
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Notes:
1. **Bolded** values indicate the result was detected greater than the limit of detection.
2. All laboratory reported results in nanograms per gram (ng/g) were converted to milligrams per kilogram (mg/kg).
3. Data are compared to the 2022 Office of the Secretary of Defense (OSD) risk screening levels, (OSD. 2022. Memorandum: Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program. July).
4. Gray shaded values indicate the result was detected greater than or equal to the OSD risk screening level for the residential scenario.
Italicized values indicate the result was detected greater than the OSD risk screening level for the industrial/commercial and residential scenario.

Acronyms/Abbreviations:
-- = not applicable/not analyzed
% = percent
AOPI = area of potential interest
CAS = Chemical Abstracts Service number
FD = field duplicate sample
I/C = industrial/commercial receptor scenario
ID = identification
mg/kg = milligrams per kilogram (parts per million)
N = primary sample
PFAS = per- and polyfluoroalkyl substances
Qual = qualifier
R = residential receptor scenario
SU = standard unit

Qualifier	Description
J	The analyte was positively identified; however the associated numerical value is an estimated concentration only.
U	The analyte was analyzed for but the result was not detected above the limit of quantitation (LOQ).
UJ	The analyte was analyzed for but was not detected. The reported LOQ is approximate and may be inaccurate or imprecise.

Appendix M
SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			Sample ID	LHAAP-EB-1-120122		LHAAP-EB-2-112822		LHAAP-EB-3-120122		LHAAP-EB-4-120122	
			Sample Date	12/01/2022		11/28/2022		12/01/2022		12/01/2022	
			Sample Type	Equipment Blank		Equipment Blank		Equipment Blank		Equipment Blank	
			Equipment Type	Water Level Meter		Hand Auger		Bailer		Tubing	
Analyte	CAS	Units		Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		7.4	U	7.6	U	7.5	U	7.5	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		7.4	U	7.6	U	7.5	U	7.5	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		7.4	U	7.6	U	7.5	U	7.5	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		7.4	U	7.6	U	7.5	U	7.5	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.7	U	3.8	U	3.8	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.7	U	3.8	U	3.8	U	3.7	U

Appendix M
SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			Sample ID	LHAAP-EB-5-120122		LHAAP-EB-06-112922		LHAAP-EB-6-120122		LHAAP-EB-7-010523	
			Sample Date	12/01/2022		11/29/2022		12/01/2022		01/05/2023	
			Sample Type	Equipment Blank		Equipment Blank		Equipment Blank		Equipment Blank	
			Equipment Type	Acetate Liner		Drilling Equipment		Drilling Equipment		Tubing	
Analyte	CAS	Units		Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		7.1	U	7.0	U	7.9	U	7.3	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		7.1	U	7.0	U	7.9	U	7.3	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		7.1	U	7.0	U	7.9	U	7.3	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		7.1	U	7.0	U	7.9	U	7.3	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		3.6	U	3.5	U	4.0	U	3.6	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.6	U	3.5	U	4.0	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.6	U	3.5	U	4.0	U	3.7	U

Appendix M
SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			Sample ID	LHAAP-FB-1-GW-112822		LHAAP-FB-2-GW-112822		LHAAP-FB-3-GW-112922		LHAAP-FB-4-GW-113022	
			Sample Date	11/28/2022		11/28/2022		11/29/2022		11/30/2022	
			Sample Type	Field Blank		Field Blank		Field Blank		Field Blank	
			Equipment Type	N/A		N/A		N/A		N/A	
Analyte	CAS	Units		Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		6.8	U	7.8	U	8.7	U	7.4	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		6.8	U	7.8	U	8.7	U	7.4	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		6.8	U	7.8	U	8.7	U	7.4	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		6.8	U	7.8	U	8.7	U	7.4	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.4	U	3.9	U	4.4	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.4	U	3.9	U	4.4	U	3.7	U

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SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			Sample ID	LHAAP-FB-5-GW-113022		LHAAP-FB-6-010523		LHAAP-SB-01-112922		LHAAP-SB-2-120122	
			Sample Date	11/30/2022		01/05/2023		11/29/2022		12/01/2022	
			Sample Type	Field Blank		Field Blank		Source Blank		Source Blank	
			Equipment Type	N/A		N/A		N/A		N/A	
Analyte	CAS	Units		Result	Qual	Result	Qual	Result	Qual	Result	Qual
PFAS											
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		7.0	U	7.4	U	7.8	U	7.4	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		7.0	U	7.4	U	7.8	U	7.4	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		7.0	U	7.4	U	7.8	U	7.4	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		7.0	U	7.4	U	7.8	U	7.4	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.5	U	3.7	U	**4.4**		3.7	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		3.5	U	3.7	U	**8.2**		3.7	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.5	U	3.7	U	3.9	U	3.7	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.5	U	3.7	U	3.9	U	3.7	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		3.5	U	3.7	U	**3.2**	J	3.7	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.5	U	3.7	U	**3.3**	J	3.7	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		3.5	U	3.7	U	**9.2**		3.7	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		3.5	U	3.7	U	3.9	U	3.7	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.5	U	3.7	U	**3.9**		3.7	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		3.5	U	3.7	U	**3.6**	J	3.7	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		3.5	U	3.7	U	**9.7**		3.7	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.5	U	3.7	U	3.9	U	3.7	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.5	U	3.7	U	3.9	U	3.7	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.5	U	3.7	U	3.9	U	3.7	U

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SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
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			Sample ID	LHAAP-012-DEB-1-111622		LHAAP-016-DEB-2-111622		LHAAP-FWDF-DEB-3-010623	
			Sample Date	11/16/2022		11/16/2022		01/06/2023	
			Sample Type	Dedicated Equipment Blank		Dedicated Equipment Blank		Dedicated Equipment Blank	
			Equipment Type	LHAAP-12WW24		LHAAP-16WW16		LHAAP-50WW12	
Analyte	**CAS**	**Units**		**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PFAS									
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		7.7	U	7.4	U	7.3	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		7.7	U	7.4	U	7.3	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		7.7	U	7.4	U	7.3	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		7.7	U	7.4	U	7.3	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.8	U	3.7	U	3.6	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		**2.3**	J+	**4.2**		3.6	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.8	U	3.7	U	3.6	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.8	U	3.7	U	3.6	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		3.8	U	3.7	U	3.6	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.8	U	3.7	U	3.6	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		3.8	U	3.7	U	3.6	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		3.8	U	3.7	U	3.6	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.8	U	3.7	U	3.6	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		**11**		**2.5**	J	3.6	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		3.8	U	**1.9**	J	3.6	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.8	U	3.7	U	3.6	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.8	U	3.7	U	3.6	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.8	U	3.7	U	3.6	U

Appendix M
SI Laboratory Analytical Results - Blanks
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Former Longhorn Army Ammunition Plant, Texas

		Sample ID	LHAAP-BG3-DEB-4-010623	
		Sample Date	01/06/2023	
		Sample Type	Dedicated Equipment Blank	
		Equipment Type	LHAAP-120	
Analyte	**CAS**	**Units**	**Result**	**Qual**
PFAS				
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L	7.2	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L	7.2	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L	7.2	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L	7.2	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L	3.6	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L	3.6	UJ
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	3.6	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	3.6	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	**1.9**	J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L	**5.3**	
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	3.6	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	3.6	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L	**18**	
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	**13**	
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L	3.6	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L	3.6	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	3.6	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L	3.6	U

Appendix M
SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			Sample ID	LHAAP-PA3-DEB-5-010523		LHAAP-PWTP-DEB-6-010523		LHAAP-PA2-DEB-7-010523	
			Sample Date	01/05/2023		01/05/2023		01/05/2023	
			Sample Type	Dedicated Equipment Blank		Dedicated Equipment Blank		Dedicated Equipment Blank	
			Equipment Type	LHAAP-47WW19		LHAAP-04WW08		LHAAP-46WW06	
Analyte	CAS	Units		Result	Qual	Result	Qual	Result	Qual
PFAS									
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		7.7	U	**5.9**	J-	8.1	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		7.7	U	11	UJ	8.1	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		7.7	U	11	UJ	8.1	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		7.7	U	11	UJ	8.1	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.9	U	5.4	UJ	4.0	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		**770**	J+	**130**	J+	**810**	
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.9	U	5.4	UJ	4.0	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.9	U	5.4	UJ	4.0	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		**200**		**12**	J-	**17**	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.9	U	5.4	UJ	4.0	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		**570**		**28**	J-	**42**	
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		**2.4**	J	**3.9**	J-	**3.0**	J
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.9	U	**2.9**	J-	4.0	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		**26**		**4.9**	J-	**3.8**	J
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		**780**		**46**	J-	**130**	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.9	U	5.4	UJ	4.0	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.9	U	5.4	UJ	4.0	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.9	U	5.4	UJ	4.0	U

Appendix M
SI Laboratory Analytical Results - Blanks
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

			Sample ID	LHAAP-VWR-DEB-8-113022		LHAAP-PWTP-DEB-9-113022	
			Sample Date	11/30/2022		11/30/2022	
			Sample Type	Dedicated Equipment Blank		Dedicated Equipment Blank	
			Equipment Type	LHAAP-35AWW16		LHAAP-04WW08	
Analyte	CAS	Units		Result	Qual	Result	Qual
PFAS							
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/L		7.5	U	7.2	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/L		7.5	U	7.2	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/L		7.5	U	7.2	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/L		7.5	U	7.2	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/L		3.7	U	3.6	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/L		**5.7**		3.6	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L		3.7	U	3.6	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L		3.7	U	3.6	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L		3.7	U	3.6	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/L		3.7	U	3.6	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L		3.7	U	3.6	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/L		3.7	U	3.6	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/L		3.7	U	3.6	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L		3.7	U	3.6	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L		3.7	U	3.6	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/L		3.7	U	3.6	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L		3.7	U	3.6	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/L		3.7	U	3.6	U

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Notes:
1. **Bolded** values indicate the result was detected greater than the limit of detection.

Acronyms/Abbreviations:
-- = not applicable
% = percent
CAS = Chemical Abstracts Service number
HDPE = high-density polyethylene
ID = identification
ng/L = nanograms per liter (parts per trillion)
PFAS = per- and polyfluoroalkyl substances

Qualifier	Description
J	The analyte was positively identified; however the associated numerical value is an estimated concentration only.
J+	The result is an estimated quantity; the result may be biased high.
J-	The result is an estimated quantity; the result may be biased low.
U	The analyte was analyzed for but the result was not detected above thelimit of quantitation (LOQ).
UJ	The analyte was analyzed for but was not detected. The reported limit of quantitation (LOQ) is approximate and may be inaccurate or imprecise.

Appendix M
SI Laboratory Analytical Results - IDW
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

		Sample/Parent ID	LHAAP-IDW-W-113022		LHAAP-IDW-SO-113022	
		Sample Date	11/30/2022		11/30/2022	
		Sample Type	N		N	
Analyte	**CAS**	**Units**	**Result**	**Qual**	**Result**	**Qual**
Anions						
Reactive Sulfide	--	mg/kg	50	U	50	HU
General Chemistry						
Cyanide Reactivity	--	mg/kg	50	U	50	HU
Flashpoint	10-36-6	F	**140**		**140**	
Percent Solids	--	%			**82.8**	
pH	--	SU	**7.3**		**7.7**	
Metals						
Arsenic	7440-38-2	mg/l	0.15	U	0.15	U
Barium	7440-39-3	mg/l	0.25	U	**2.8**	
Cadmium	7440-43-9	mg/l	0.050	U	0.050	U
Chromium	7440-47-3	mg/l	0.10	U	0.10	U
Lead	7439-92-1	mg/l	0.10	U	0.10	U
Mercury	7439-97-6	mg/l	0.0020	U	0.0020	U
Selenium	7782-49-2	mg/l	0.20	U	0.20	U
Silver	7440-22-4	mg/l	0.10	U	0.10	U
PFAS						
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	27619-97-2	ng/l	**17**		2.4	U
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	39108-34-4	ng/l	7.2	U	2.4	U
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	ng/l	7.2	U	2.4	U
N-Methylperfluoroocatane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	ng/l	7.2	U	2.4	U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	ng/l	3.6	U	1.2	U
Perfluorobutanoic acid (PFBA)	375-22-4	ng/l	**3.3**	J	1.2	U
Perfluorodecanoic acid (PFDA)	335-76-2	ng/l	3.6	U	1.2	U
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/l	3.6	U	1.2	U
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/l	3.6	U	1.2	U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	ng/l	3.6	U	1.2	U
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/l	3.6	U	1.2	U
Perfluorononanoic acid (PFNA)	375-95-1	ng/l	**9.1**		1.2	U
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	ng/l	**3.7**		1.2	U
Perfluorooctanoic acid (PFOA)	335-67-1	ng/l	**24**		1.2	U
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/l	**2.4**	J	1.2	U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	ng/l	3.6	U	1.2	U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/l	3.6	U	1.2	U
Perfluoroundecanoic acid (PFUdA)	2058-94-8	ng/l	3.6	U	1.2	U

Appendix M
SI Laboratory Analytical Results - IDW
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

		Sample/Parent ID	LHAAP-IDW-W-113022		LHAAP-IDW-SO-113022	
		Sample Date	11/30/2022		11/30/2022	
		Sample Type	N		N	
Analyte	CAS	Units	Result	Qual	Result	Qual
SVOCs						
1,4-Dichlorobenzene	106-46-7	mg/l	0.040	U	0.040	U
2,4,5-Trichlorophenol	95-95-4	mg/l	0.040	U	0.040	U
2,4,6-Trichlorophenol	88-06-2	mg/l	0.040	U	0.040	U
2,4-Dinitrotoluene	121-14-2	mg/l	0.080	U	0.080	U
2-Methylphenol	95-48-7	mg/l	0.040	U	0.040	U
4-Methylphenol	106-44-5	mg/l	0.040	U	0.040	U
Hexachloro-1,3-butadiene	87-68-3	mg/l	0.040	U	0.040	U
Hexachlorobenzene	118-74-1	mg/l	0.040	U	0.040	U
Hexachloroethane	67-72-1	mg/l	0.040	U	0.040	U
Nitrobenzene	98-95-3	mg/l	0.040	U	0.040	U
Pentachlorophenol	87-86-5	mg/l	0.20	U	0.20	U
Pyridine	110-86-1	mg/l	0.040	U	0.040	U
VOCs						
1,1-Dichloroethene	75-35-4	mg/l	0.050	U	0.050	HU
1,2-Dichloroethane	107-06-2	mg/l	**0.014**	J	0.050	HU
2-Butanone (MEK)	78-93-3	mg/l	0.10	U	0.10	HU
Benzene	71-43-2	mg/l	0.050	U	0.050	HU
Carbon Tetrachloride	56-23-5	mg/l	0.050	U	0.050	HU
Chlorobenzene	108-90-7	mg/l	0.050	U	0.050	HU
Chloroform	67-66-3	mg/l	0.050	U	0.050	HU
Tetrachloroethene	127-18-4	mg/l	0.050	U	0.050	HU
Trichloroethene	79-01-6	mg/l	**0.98**		0.050	HU
Vinyl chloride	75-01-4	mg/l	0.010	U	0.010	HU

Appendix M
SI Laboratory Analytical Results - IDW
USAEC PFAS Preliminary Assessment/Site Inspection
Former Longhorn Army Ammunition Plant, Texas

Notes:
1. **Bolded** values indicate the result was detected greater than the limit of detection.

Acronyms/Abbreviations:
-- = not applicable
% = percent
CAS = Chemical Abstracts Service number
F = Fahrenheit
ID = identification
mg/L = milligrams per liter
N = primary sample
ng/L = nanograms per liter (parts per trillion)
PFAS = per- and polyfluoroalkyl substances
SU = standard unit
SVOC = semivolatile organic compound
VOC = volatile organic compound

Qualifier	Description
H	The sample was out of holding time.
J	The analyte was positively identified; however the associated numerical value is an estimated concentration only.
U	The analyte was analyzed for but the result was not detected above the limit of quantitation (LOQ).

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

September 11, 2023

SUBJECT: Draft Final Ninth Annual Remedial Action Operation Report, LHAAP-67 (Aboveground Storage Tank Farm), Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, September 2023

Mr. Brian Follin
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270-2002

Dear Mr. Follin,

An electronic copy of the above referenced document has been added to the project portal's "Documents" folder at the following address for your review: (https://docs.cbifederalservices.com/sites/501032/regulators/Shared%20Documents/Forms/AllItems.aspx). An electronic copy of this letter and download instructions for the electronic file have been sent via email. The Draft Final document includes revisions based upon the Environmental Protection Agency (EPA) comments on the Draft version received on July 3, 2023. The Texas Commission on Environmental Quality (TCEQ) indicated that they had no comments on the document via email on June 23, 2023. A table of responses to the EPA comments on the Draft version is included with this Draft Final document. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment.

The document was prepared by the Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Zack Beck, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at (726) 999-0505, or by email at lena.j.sierocinski.civ@army.mil.

Sincerely,

Lena Sierocinski

Lena Sierocinski
LHAAP Environmental Support Manager
U.S. Army Environmental Command

Electronic copies furnished:
A. Palmie, TCEQ, Austin, TX
E. Duerkop, USFWS, Caddo Lake NWR, TX (1 hard copy and 1 CD)
C. Montoya USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
K. Russell, BRAC, Huntsville, AL
Z. Beck, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
US ARMY ENVIRONMENTAL COMMAND
2455 REYNOLDS ROAD
JOINT BASE SAN ANTONIO FORT SAM HOUSTON, TX 78234-7588

September 11, 2023

SUBJECT: Draft Final Ninth Annual Remedial Action Operation Report, LHAAP-67 (Aboveground Storage Tank Farm), Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas, September 2023

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Dear Ms. Palmie,

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Sincerely,

Lena Sierocinski

Lena Sierocinski
LHAAP Environmental Support Manager
U.S. Army Environmental Command

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C. Montoya USACE, Tulsa District, OK
A. Williams, USACE, Tulsa District, OK
K. Russell, BRAC, Huntsville, AL
Z. Beck, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

Response to USEPA Comments on
Eighth Annual Remedial Action Operation Report
LHAAP-46 (Plant 2 Area)

Document Date: 30 May 2023
Comment Date: 3 July 2023

Reviewer: Brian Follin - USEPA
Respondent: Lena Sierocinski - Army

Respondent Concurs (C), Does Not Concur (D)
Commenter Agrees (A) with response, or Does Not Agree (D) with response

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
Reviewer #1:						
1	Acronyms and Abbreviations section	Entries	Some abbreviations/acronyms in the report (text, tables and/or figs.) are missing from the "Abbreviations and Acronyms" section in front matter of report: APTIM, ft, MSL (where used without preceding "a" [i.e., when not used as part of "amsl"]), C°, cells/mL, CEQ/mL, FD, GW-Ind, mS/cm, mV, NTU, NV, REG, FD, and U.	C	The Acronyms and Abbreviations section has been updated.	
2	Acronyms and Abbreviations section in various locations report	Use of "TOC"	Note: "TOC" means two different things in the report—"top of casing" and "total organic carbon." Generally not recommended to use the same abbreviation to represent two different things in a report.	C	In Table 2-2, "Top of Casing" has been spelled out so that only total organic carbon is abbreviated in the report.	
3	Section 1.4, p. 1-3	2nd paragraph, 4th sentence	Unclear how a depth of ~50 ft bgs was determined to represent the approximate bottom of the newly defined uppermost ground water-bearing unit (consisting of the former shallow and intermediate zones) and a depth of approximately 68 ft was determined to represent the top of the deeper underlying "intermediate zone — do these depths represent the top and bottom of the aquitard described a few sentences later?	C	The definition of the water bearing zones is presented in the LHAAP-67 Final RACR (AECOM 2016). The end of the shallow zone and the top of the intermediate zone were determined on the bases of lithology and static groundwater levels from 67WW06, the boring from 67DPT14, and the well log from 16WW16I. Elevated levels of COCs have not been observed above detection limits in 16WW16I since	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
			Was the aquitard identified/defined on the basis of lithology, substantially differing hydraulic heads in wells completed above and below the depth interval comprising the unit, or both characteristics? Does the aquitard compose the entire 50–68 ft depth interval between the two "zones?" What is the lithology of the aquitard? Importantly, are existing data sufficient to determine if the aquitard underlies all of LHAAP-67? Would be helpful to revise text in response to questions given above.		the well was installed in 2016; therefore, the intermediate zone is considered not contaminated and further delineation has not occurred. The information provided in the RACR is also summarized in Section 1.4 as follows, "Therefore, the previously designated shallow and intermediate zones are now considered to be hydraulically connected and constitute a single uppermost groundwater-bearing unit at LHAAP-67 to a depth of approximately 50 feet bgs. Therefore, monitoring well 67WW06, which was previously identified as an intermediate zone well, has been reclassified as a shallow zone monitoring well, screened in the uppermost groundwater-bearing unit. A deeper "intermediate" water-bearing zone was identified at a depth of approximately 68 feet bgs in boring 67DPT14 (drilled in June 2014), with a clear aquitard separating this unit from the shallow zone. To assess the deeper "intermediate" water-bearing zone, 67WW16I was installed in May 2016 to a depth of 78 ft bgs." Additional information is presented in the LHAAP-67 Final RACR (AECOM 2016).	
4	Section 1.4, p. 1-5	Last paragraph, last sentence	Based on current potentiometric-surface map (fig. 2-2) and current plume extent map (fig. 2-4), the plumes are not currently bounded to the north-northeast.	C	Agreed. Monitoring well 16WW17 was installed in July 2019 to bound the plume to the north. Another well may need to be installed to the northeast in the future. Following text will be added to the end of the paragraph: "The plume is not bound to the northeast and east beyond monitoring well 67WW12	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
					where 1,1-DCE has been detected above the MCL and additional monitoring well(s) may be required in the future."	
5	Section 2.2.1, p. 2-2	1st bullet, 1st sentence	The portion of the sentence after "67WW10" ("…were replaced the sampling of 67WW04…") is nonsensical and needs revised.	C	The sentence has been modified for clarity and the revised sentence is as follows: "Monitoring wells 67WW09A and 67WW10 ~~were~~ replaced ~~the sampling of~~ 67WW04 to bound the plume to the south (AECOM 2017). Monitoring well 67WW04 was reduced to being gauged for water levels only during each sampling event (AECOM 2017)."	
6	Section 2.2.2, p. 2-2	1st paragraph, 4th sentence and fig. 2-2	Part of the sentence indicates there was "some flow to the east in the southern portion of the site." Examination of the potentiometric-surface map (fig. 2-2) indicates the flow in this area was to the northeast, so recommend replacement of "east" with "northeast."	C	First part of the sentence refers to northeastern flow. The sentence has been revised to point out northwestern direction of flow in the western part of the site and in response to Comment 7 below as follows: "Based on the gauging data during this event, the groundwater flow direction is interpreted to be to the north and northeast, with some flow to the northwest in the western portion of the site."	
7	Section 2.2.2, p. 2-2	1st paragraph, 4th sentence and fig. 2-2	Fig. 2-2 (and blue groundwater-flow line) indicates there also is some flow to the northwest (in the area immediately northwest of yellow shaded portion of site)	C	Please see response above to Comment 6.	
8	Section 2.2.2, p. 2-2	1st paragraph, 5th sentence	Sentence indicates groundwater elevations were higher in the spring and lower in the fall, citing fig. 2-3 as supporting evidence. While this may be true, the labeling of the x-axis on fig. 2-3 makes it very difficult for the reader to determine which dates/times correspond to the various plotted measurements. Strongly suggest revising axis to improve utility of the figure.	C	Vertical grid lines have been added to Figure 2-3 for better utility and the text has been revised as shown below for clarity. "As previously noted, the groundwater levels have fluctuated with seasonal precipitation, with the groundwater elevations higher in the spring and lower in the fall, often below 177 feet amsl, as shown on Figure 2-3."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
9	Fig. 2-2	Map portion of fig.	Commend use of blue groundwater-flow lines instead of straight arrows(!) — better reflects groundwater flow and facilitates examination of plume extent/ location/ movement in relation to groundwater flow (at least at the general timeframe of groundwater-elevation measurements). In relation to the flowlines, recommend the following modifications: 1) extend easternmost flow line through the lowest elevation potentiometric-surface contour (176.50 ft above MSL) 2) would be helpful to add a third flow line through the center of the site (specifically, would be helpful to have flow line intersect location of well 67WW01). 3) If additional flowline is added per #2, also would need to add the new flowline to figs. 2-4 and 3-2.	C	1. The eastern most flow line has been extended. 2. An additional flow line has been added in the center of the figure. 3. These updated flow lines have been added to Figures 2-4 and 3-2.	
10	Fig. 2-3	Axes	1) Y-axis label should indicate the groundwater elevation is in feet above mean sea level (i.e., "feet" is missing). 2) The labeling of the x-axis makes it very difficult for the reader to determine which dates/times correspond to the various plotted measurements.	C	Figure 2-3 has been updated to add the word "feet" to the Y-axis and vertical grid lines have been added to the x-axis for better clarity.	
11	Fig. 2-4	Explanation portion of fig.	1) Unlike all other abbreviations/acronyms in figure, "VOC" is not defined under "Note:" (additionally, believe "Note:" should be pluralized to "Note**s**:"?). 2) "RA-O" is defined as "Remedial Action Operation**s**"— believe "Operations" should be singular? (note: comment applies to explanation portion of many figs.). 3) Would be helpful to add "are only used for groundwater-level measurements" after "RA-O monitoring network" (i.e., "Monitoring wells 67WW04 and 67WW06 are no longer part of the RA-O monitoring network and are only used for groundwater-level measurements."	C	Edits have been made. See revised Figure 2-4.	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
12	Section 3.1, p. 3-1	1st paragraph, 1st sentence	The word "a**b**sorption" should be "a**d**sorption."	D	The EPA definition was reviewed, and the text has been revised correctly to "sorption".	
13	Fig. 3-1	Main body of fig.	1) The labeling of the x-axis on fig. 3-1 makes it very difficult for the reader to determine which dates/times correspond to the various plotted measurements. 2) For well 67WW13, the yellow line for "1,1,2-TCA" is mislabeled as "Series4."	C	1. To make the figures more easily readable we have added a second sheet, with only 4 charts per figure, (Figures t 3-1a and 3-1b). Vertical gridlines have also been added for clarity. 2. The label has been updated to say "1,1,2-TCA".	
14	Fig. 3-2	Map portions of fig.	1) Well identifiers are missing for all wells shown on all 4 maps. 2) The word "November" is misspelled in "November 2022" (lower right map).	C	1. Well identifiers are purposely not included to keep the figure uncluttered and to emphasize changes in the plume shapes as the primary focus of the figure. 2. "Novembr" will be replaced with "November".	
15	Section 3.1.1, p. 3-1	1st paragraph, 1st and 5th sentences of paragraph	First sentence of paragraph identifies wells 67WW09A and 67WW10 as upgradient monitoring wells. However, potentiometric-surface map shown in fig. 2-2 indicates well 67WW14 should be considered an upgradient monitoring well for the November 2022 potentiometric-surface map. Comment also applies to the 5th sentence of paragraph, which identifies well 67WW14 as a "cross gradient" well. Presumably, the "cross gradient" designation was reflective of previous potentiometric-surface map/groundwater flow directions? Consequently, would be helpful to revise text accordingly, including noting/describing change in well 67WW14's relation to groundwater-flow direction (upgradient versus cross-gradient) at the site.	C	The text has been revised to state that 67WW14 is currently an upgradient well in the 1st and 5th sentences. The following sentence has been added after the first sentence of the paragraph: "Monitoring Well 67WW14 has been an important well in defining the southwestern edge of the plume as it has been an in-plume well (2019), a side gradient well (2021), and an upgradient well (2022) over the last three years."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
16	Section 3.1.1, p. 3-1	3rd paragraph, 2nd sentence (after semicolon)	Sentence indicates 1,1,2-TCA concentration decreased from 5.95 µg/L, but table 2-4 indicates concentration was 5.9 µg/L (notice there is only one digit after decimal point). Additionally, it should be noted the 5.9 µg/L value is for the field duplicate sample (FD), not the regular sample (REG) from the well (which is substantially different because it was a nondetect [<1 µg/L]).	C	The following sentence was added as the last sentence in Section 3.1, prior to Section 3.1.1. "The field duplicate VOC data was used in November 2021 for monitoring well 67WW13 because the regular sample results were non-detect and the field duplicate data were more consistent with historic and 2022 data." and The sentence referenced in the comment has been revised to provide clarity and data from the regular sample as follows: "1,1,2-TCA concentrations have fluctuated near the MCL at well 67WW13 from 5.7 µg/L in 2020 to 5.9 µg/L J in 2021, to 4.3 µg/L in 2022."	
17	Section 3.1.1, p. 3-2	2nd paragraph, 2nd sentence	Sentence is awkwardly constructed. Suggest revising sentence to improve readability and clarity.	C	The sentence has been revised for clarity as follows" The most notable change in the plume is that 1,1,2-TCA has been reduced to below the MCL of 5 µg/L; and therefore, the plume contour for this compound is not shown on Figure 3-2.	
18	Section 3.1.1, p. 3-2	2nd paragraph, 4th sentence	"1,**2**-DCE" at beginning of sentence should be "1,**1**-DCE".	C	The text has been revised to "1,1-DCE".	
19	Section 3.1.1, p. 3-2	3rd paragraph, 2nd sentence	A space is missing between "90" and "feet" in the parenthetical after "67WW17."	C	A space has been added between "90" and "feet".	
20	Section 3.1.1, p. 3-2	3rd paragraph, 3rd sentence	Would be helpful to add the phrase "at a concentration of 5.5 µg/L" after "in 2020."	C	The sentence has been revised as follows: "At 67WW02, 1,2-DCA was detected above the MCL only once, in 2020 at a concentration of 5.5 µg/L, and was below the detection limit of 0.2 µg/L in 2022."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
21	Section 3.1.2, p. 3-2	1st paragraph, 6th sentence	Sentence indicates the primary sample concentration was used for locations with field duplicate samples—this is not true for all wells. For well 67WW13, the field duplicate sample (FD) concentration value (5.9 µg/L) was used instead of the regular sample (REG) concentration value (<1 µg/L).	C	The data in the field duplicate sample is more representive of the historic and current data. The text has been revised as follows: "For locations with field duplicate samples, the primary sample concentration was used in the trend analysis, except for the November 2021 data at 67WW13. At 67WW13, the field duplicate sample was used in November 2021 because all VOC data in the regular sample were non-detect and the field duplicate VOC data were more representative of the groundwater when compared to historic and 2022 data."	
22	Section 3.1.2, p. 3-3, **Significant Increases** section	Bullet for well 67WW02, 2nd and 3rd sentences	Sentence indicates consecutive 1,1-DCE non-detect values from 2013 until the last 2014 sample were removed for trends analysis purposes — this is not correct. Per appendix E (and examined in relation to page 7 of table 2-4), the last sample 2014 sample (collected 3/14) was used in the analysis (and was set to one half the detection limit shown in table 2-4). Additionally, the later part of sentence indicates an additional "9 subsequent data points" were used to determine the trend — appendix E indicates there were an additional 13 data points used to determine the trend.	D/C	The text correctly states "The consecutive non-detect values from 2013 until the last 2014 sample were removed from the Mann-Kendall analysis"; therefore, the December 2014 non-detect value is the first one being used. Agreed and the text has been revised to the following: "Due to the six consecutive non-detect values between 2013 and 2015, the Mann-Kendall trend analysis data set begins with only one non-detect value in December 2014 and includes twelve subsequent data points to determine the trend."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
23	Section 3.1.2, p. 3-3, **Significant Increases** section	Bullet for well 67WW02, 6th sentence	Sentence indicates concentrations were higher in the spring than in the summer until November 2020. This somewhat "mischaracterizes" the sampling results from the well because table 2-4 indicates there were no spring samples collected beginning in 2020 (although concentrations did reach their highest in November 2020). Consequently, sentence should be revised to clarify.	C	To add clarification, 1. The following sentence has been added after "Mann Kendall analysis": "Starting in November 2020, groundwater sampling frequency has been changed from semi-annually to annually and will continue to be in the fall of each year. " 2. The original 6th sentence has been revised as follows: "Concentrations have been the highest during the spring sampling events until the November 2020 sampling event, when levels increased to the highest level of 1,1-DCE at 220 µg/L as shown on Figure 3-1."	
24	Section 3.1.2, p. 3-3, **Significant Increases** section	Bullet for well 67WW02, last sentence of bulleted paragraph	Sentence indicates wells 67WW17 and 67WW18 are downgradient of well 67WW02, but the current (November 2022) potentiometric-surface map (fig. 2-2) indicates the wells were more cross-gradient than downgradient at that time.	C	Agreed, these two wells are side gradient, and the last sentence of the paragraph has been removed.	
25	Section 3.1.2, p. 3-4, **Significant Increases** section	Bullet for well 67WW13, 4th sentence	Sentence mistakenly indicates the lowest 1,1,2-TCA concentration in well 67WW13 since 2013 was 3.9 µg/L in May 2019. Page 57 of table 2-4 indicates the lowest concentration was 1.99 µg/L (on 5/6/14).	C	The sentence has been revised as follows: "Since 2013, 1,1,2-TCA levels ranged from 7.66 µg/L in November 2015, to 1.99 µg/L in May 2014."	
26	Section 3.1.2, p. 3-4, **Stable/No Trend** section	Bullet for well 67WW13, 3rd sentence	Sentence mistakenly indicates 1,1-DCE concentrations in well 67WW13 fluctuated from 240 to 720 µg/L over 9 years of RA-O monitoring ending in November 2020. Page 59 of table 2-4 indicates the lowest concentration for this time period was 160 µg/L (on 5/1/18).	C	The sentence has been revised as follows: "Over the nine years of RA-O sampling, 1,1-DCE concentrations fluctuated from 160 µg/L in May 2018 to 720 µg/L in November 2020."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
27	Section 3.1.3, p. 3-5	1st paragraph, 2nd sentence	1) Sentence indicates a decreasing trend was observed for 1,1-DCE **and** 1,2-DCA in well 67WW08. However, report text (p. 3-3), table 3-3, and appendix E indicate only 1 trend (1,1-DCE concentrations with time) was statistically evaluated for this well (also see #2 immediately below). 2) Some COC trends in the report are described as increasing or decreasing, even though the COCs' trends were not statistically evaluated (e.g., as described in #1 immediately above). If intent is to indicate concentrations of some COCs increased or decreased with time, and no corresponding statistical trends tests were performed to support these statements, it would be preferable (i.e., more defensible) to simply indicate the COC concentrations increased or decreased with time (and reference supporting information such as tables and figures) rather than indicate trends were increasing or decreasing with time. References to increasing or decreasing trends leads the reader to believe statistical trends testing results support these conclusions. If the COC concentration trends were evaluated quantitatively (i.e., statistically) in previous reports, should indicate that was the case.	C	1. The first two sentences have been revised for clarity as follows: "At this cross-gradient in-plume well, the decreasing trend was observed for 1,1-DCE. During the Year 8 RA-O, 1,2-DCA also showed a decreasing trend; however, the concentration was below the MCL in November 2022." 2. The sentence in #1 is discussing statistically evaluated trend. The report has been reviewed so that the words "significantly" or "statistically significant" will only be used when discussing trends that have been statistically evaluated.	
28	Section 3.1.4, p. 3-6	1st paragraph, 1st sentence	The word "trends" in "overall trends" should be singular, and the word "are" should be changed to "is" because only one constituent trend (1,1-DCE) is being discussed in this sentence (subject-verb agreement).	C	The sentence has been revised as follows: "At downgradient well 67WW02, the 1,1-DCE concentration remained the same in 2021 and 2022 at 100 µg/L; however, levels have been fluctuating with groundwater levels, and the overall trend is increasing."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
29	Section 3.1.4, p. 3-6	1st paragraph, last sentence	Sentence indicates downgradient wells 67WW17, 67WW18, and 67WW05 "bounded" the downgradient edges of plumes in November 2022. While that may be true, comparison of the potentiometric surface (fig. 2-2) with mapped plume extents (fig. 2-4) indicates there are no wells downgradient of the plume edges for groundwater flowing through much of the rest of the LHAAP-67 area, including the broad area downgradient of the northern and northeastern edges of the plumes.	C	Agreed. Noted. The three downgradient monitoring wells, 67WW17, 67WW18, and 67WW05, do bound the plume to the west but do not bound the plume to the broad area downgradient of the northern and northeastern edges of the plumes. The text has been revised to state that these wells bound the northwestern downgradient edge as follows. "The three other downgradient monitoring wells, 67WW17, 67WW18, and 67WW05, were non-detect for site COCs in November 2022, thus bounding the northwestern downgradient edge of the plumes."	
30	Section 3.1.4, p. 3-6	2nd paragraph, 1st sentence	A "1" is missing before ",1-DCE" (i.e., should be "…with the exception of **1**,1-DCE…").	C	Per comment 31, the sentence has been revised as follows: "Although a slight increase in 1,1-DCE was observed from 18 µg/L in November 2021 to 19 µg/L in November 2022, a decreasing trend continues to be observed."	
31	Section 3.1.4, p. 3-6	2nd paragraph, 1st and 2nd sentences	Cited sentences refer to decreasing COC trends. However, only one COC (1,1-DCE) from this well was statistically evaluated/tested for trend (see comment #27 [comment #2]).	C	For clarity, the first and second sentences have been revised along with a new sentence which was also added as follows:" At cross-gradient in-plume monitoring well 67WW08, COC trends for 1,1-DCE and 1,2-DCA were evaluated during the past Annual RA-O reports. During the 2022 RA-O sampling event, only 1,1-DCE was above the MCL and was evaluated. Although a slight increase in 1,1-DCE was observed from 18 µg/L in November 2021 to 19 µg/L in November 2022, a decreasing trend continues to be observed."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
32	Section 3.1.4, p. 3-6	3rd paragraph, 1st sentence	Sentence indicates 2 COCs increased above the detection limit in November 2021 for the 1st time since 2015 — this is not entirely correct because table 2-5 indicates this was also true for a third COC (TCE; 1.4 µg/L), although the COC (TCE) concentration was less than the MCL.	C	The sentence has been revised as follows: ”In monitoring well 67WW09, three COCs, TCE, 1,1,2-TCA and 1,2-DCA, increased to above the detection limit in November 2021 for the first time since 2015; however, in November 2022 these compounds decreased to below the detection limits of 0.2, 0.3, and 0.2 µg/L, respectively.”	
33	Section 3.1.4, p. 3-6	4th paragraph, 2nd sentence	Sentence indicates COCs in well 67WW11 have remained below the MCL since 2016. This is not true because the COC 1,1-DCE was detected at a concentration greater than the MCL in May 2016.	C	The sentence has been revised as follows: “Since 2017, COCs have remained below the MCLs, which suggests that natural attenuation has decreased contaminant levels, likely due to dilution effects from upgradient groundwater.”	
34	Section 3.1.4, p. 3-6	5th paragraph, 2nd sentence	Should add “since May 2016” after “have fluctuated” because 1,1-DCE was not detected in well 67WW12 before this time.	C	The sentence has been revised as follows: “At monitoring well 67WW12, located on the eastern edge of the plume, 1,1-DCE concentrations have fluctuated since May 2016 and increased from below the MCL in November 2021 to 40 µg/L for November 2022, which is the same concentration detected in November 2020.”	
35	Section 3.1.4, p. 3-6	5th paragraph, last sentence	Strongly agree with suggestion to consider adding an additional well to the northeast (and downgradient from well 67WW12). Also should consider installing an additional downgradient well to the west of this proposed well to intercept groundwater flowing northward downgradient of the plumes.	C	Noted. See response to Comment 4.	
36	Section 3.1.4, p. 3-6	6th paragraph, 1st sentence	The word “significant” should be added between “statistically” and “increasing trend.”	C	The sentence has been revised as follows: “Monitoring well 67WW13, located near the center of the plume, exhibited a stable trend for 1,1-DCE and a statistically significant increasing trend for 1,2-DCA and 1,1,2-TCA.”	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
37	Section 3.2, p. 3-8, Dissolved Oxygen section	2nd paragraph, 2nd sentence	Sentence indicates lowest DO concentration measured in year 9 RA-O was 0.05 mg/L—DO was measured at a concentration of 0.03 mg/L in wells 67WW10 and 67WW15. Also would be helpful to add a parenthetical after "four of six wells" to identify the 4 wells with DO concentrations less than 0.5 mg/L.	D	The DO levels were only evaluated at the six wells 67WW01, 67WW02, 67WW08, 67WW12, 67WW13, and 67WW15. Of these wells, 0.05 mg/L at 67WW08 was the lowest level in November 2022. The DO level at 67WW15 was 0.27 in November 2022 and was higher than the DO at 67WW08. The sentence has been revised as follows: "The DO concentrations during the Year 9 RA-O sampling event ranged from 0.05 to 1.06 mg/L, and four of the six wells (67WW02, 67WW08, 67WW12, and 67WW15) had a value below the 0.5 mg/L threshold, indicating that the groundwater conditions are generally reducing and are conducive to complete reductive dechlorination."	
38	Section 3.2, p. 3-8, Oxidation-Reduction Potential section	Last sentence in paragraph/section	Sentence indicates ORP measurements indicated generally oxidative conditions because ORP was greater than 50 mV. However, it is important to note that the DO concentrations (as discussed in previous paragraph/report section) contradict the conclusion that conditions are oxidizing—DO concentrations in 4 of the 6 wells were less than 0.5 mg/L, indicating conditions likely were reducing, not oxidizing.	C	Noted. This is often observed in the field unless the conditions are strongly oxidative or reducing.	
39	Section 3.2, p. 3-8, Nitrate section	2nd to last sentence in paragraph/section	Should add "in both wells" after "1.0 mg/L."	C	The sentence has been revised as follows: "Nitrate was analyzed in monitoring wells 67WW08 and 67WW13 during the Year 9 RA-O sampling event and has historically been below 1.0 mg/L in both wells."	
40	Section 3.2, p. 3-8, Sulfate section	4th and 7th sentences in paragraph/section	The 4th and 7th sentences are nearly identical. Should eliminate one of the sentences.	C	The 7th sentence, "In November 2022 sulfate concentrations were observed at 649 and 348 mg/L in wells 67WW08 and 67WW13, respectively" has been deleted.	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
41	Section 3.2, p. 3-8, pH section	2nd sentence in paragraph/section	A space is missing between "6.55" and "SU (67WW01)."	C	A space has been added between "6.55" and "SU (67WW01).	
42	Section 4.0, p. 4-2	3rd complete paragraph (begins with "At monitoring well 67WW02…")	The word "statistical" should be changed to "statistically," and the word "significant" should be added between "A statistical" and "increasing trend continues…" (i.e., "A statistically significant increasing trend…").	C	The sentence has been revised as follows: "A statistically significant increasing trend continues to be observed over time; however, 1,2-DCE decreased between November 2020 and November 2021 and then remained at 100 µg/L in November 2022."	
43	Section 4.0, p. 4-2	3rd complete paragraph (begins with "At the eastern edge…")	As noted previously, strongly support addition of 1–2 new monitoring wells downgradient of plumes.	C	Noted.	
44	Section 4.0, p. 4-2	4th complete paragraph (begins with "In cross-gradient …"), 1st sentence	Sentence indicates there was only one statistically significant decreasing trend in well 67WW08. However, as was noted in an earlier comment, only one COC trend was statistically evaluated for this well.	C	The sentence has been revised as follows: "In cross-gradient in-plume monitoring well 67WW08, a statistically significant decreasing trend was observed for 1,1-DCE.	
45	Section 4.0, p. 4-2	4th complete paragraph (begins with "In cross-gradient …"), 4th sentence (begins with "Using the first-order…")	After "1,2-DCA", need to select either "during" or "in," but not both words.	C	The sentence has been revised as follows: "Using the first-order rate constant for 1,2-DCA during the Year 5 RA-O, the estimated time for levels to decrease to below the MCL was less than one year, and the concentrations have remained below the MCL since October 2019."	
46	Section 4.0, p. 4-2	4th complete paragraph (begins with "In cross-gradient …"), 4th sentence (begins with "Using the first-order…")	Need to add the word "October" between "since" and "2019" because there was more than one sample collected during 2019.	C	The sentence has been revised as follows: "Using the first-order rate constant for 1,2-DCA during the Year 5 RA-O, the estimated time for levels to decrease to below the MCL was less than one year, and the concentrations have remained below the MCL since October 2019."	

Number	Section/Page	Paragraph/Line	Comment	C,D	Response	A,D
47	Section 4.0, p. 4-2	4th complete paragraph (begins with "In cross-gradient …"), 5th sentence (begins with "The degradation rate…")	In scientific/technical reports with statistics, the words "significant" or "significantly" typically are used only for discussions of statistical tests/results. The word "substantially" would be an acceptable replacement.	C	The sentence describing the cross-gradient in plume monitoring well 67WW08 is discussing the statistical trend from the Mann Kendall analysis. The 5thsentence has been revised as follows: "The degradation rate calculated may be ~~significantly~~ influenced by seasonal fluctuations in groundwater elevation; however, the change to annual sampling may create more reliable attenuation rates by eliminating the seasonal fluctuations from the data."	
48	General	General	There is concern with migration and stability in the east/ northeast of the plume. As discussed during the site visit, new wells have delineated to the northwest but eastward increases should be investigated further.	C	Noted.	

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Acronyms and Abbreviations

µg/L	micrograms per liter
APTIM	Aptim Federal Services, LCC
µmhos/cm	micromhos per centimeter
<	The analyte was not detected above the detection limit shown.
AECOM	AECOM Technical Services, Inc.
amsl	above mean sea level
AST	aboveground storage tank
bgs	below ground surface
Bhate	Bhate Environmental Associates, Inc.
cells/mL	cells per milliliter
°C	degrees Celsius
COC	contaminant of concern
DCA	dichloroethane
DCE	dichloroethene
DHC	*Dehalococcoides sp.*
DO	dissolved oxygen
ft	feet
ftBTOC	feet below top of casing
FD	field duplicate
GW-Ind	groundwater medium-specific concentration for industrial use
ID	Identifier
J	estimated value
LHAAP	Longhorn Army Ammunition Plant
LUC	land-use control
MCL	Maximum Contaminant Level
MSL	Mean Sea Level
mg/L	milligrams per liter
mL/min	milliliters per minute
MNA	monitored natural attenuation
mV	millivolts
No.	number
NTU	nephelometric turbidity unit
NA	not analyzed
NV	no value established
ORP	oxidation-reduction potential
pH	potential of hydrogen
RACR	Remedial Action Completion Report
RA-O	Remedial Action Operation

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RAWP	Remedial Action Work Plan
RD	Remedial Design
REG	Regular sample
ROD	Record of Decision
Shaw	Shaw Environmental & Infrastructure, Inc.
SU	standard unit
TCA	trichloroethane
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TOC	total organic carbon
U	Not detected; below the associated method detection limit.
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
Val Qual	validation qualifier
VOC	volatile organic compound
X	well will be analyzed for that parameter

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Tulsa District, contracted with Bhate Environmental Associates, Inc. (Bhate) under the Omaha Multiple Environmental Government Acquisition National Small Business Multiple Award Task Order Contract, Environmental Remediation Services with Military Munitions Response Program, Task Order Number (No.) W9128BV17F0150, to conduct environmental restoration at multiple sites at the former Longhorn Army Ammunition Plant (LHAAP). The Bhate Team consists of Bhate as the prime contractor and Aptim Federal Services, LLC (APTIM) as a subcontractor responsible for remedial activities at several sites, including LHAAP-67.

LHAAP is located in east Texas in the northeastern corner of Harrison County, between State Highway 43 in Karnack, Texas, and the western shore of Caddo Lake (**Figure 1-1**). The nearest cities are Marshall, Texas, approximately 14 miles to the southwest, and Shreveport, Louisiana, approximately 40 miles to the east. Caddo Lake is a large freshwater lake that bounds LHAAP to the north and east. The eastern fence of the LHAAP installation is 3.5 miles from the Texas-Louisiana state border.

A Final Record of Decision (ROD) was executed for LHAAP-67 in June 2010 (USACE 2010). Groundwater monitoring at LHAAP-67 is ongoing as described in the Final Remedial Action Completion Report (RACR) (AECOM Technical Services, Inc. [AECOM] 2016). This Ninth Annual Remedial Action Operation (RA-O) Report covers the period from May 2022 to March 2023, including the annual groundwater monitoring event in November 2022, and provides analysis for nine years of monitored natural attenuation (MNA) data.

1.1 Remedial Action Objectives

The remedial action objectives at the LHAAP-67 site must protect human health and meet applicable or relevant and appropriate requirements. There are no ecological risks at the LHAAP-67 site (USACE 2010).

The remedial action objectives for the LHAAP-67 site per the ROD (USACE 2010), consistent with the reasonably anticipated future use as a national wildlife refuge, are:

- Protection of human health by preventing human exposure to the contaminated groundwater.
- Protection of human health and the environment by preventing contaminated groundwater from migrating into nearby surface water.
- Return of groundwater to its potential beneficial use as drinking water wherever practicable.

1.2 Performance Objectives

The remedy selected for LHAAP-67 is land-use controls (LUCs) and MNA. The performance objectives at LHAAP-67 consist of two components: 1) physical inspections and 2) groundwater/surface water monitoring. As a component of the LUC implementation, the civil survey of the LUC boundary was conducted in November 2014 and recorded in the Harrison County Courthouse in December 2014. Physical inspections are conducted periodically to confirm compliance with the LUC objectives, which consist of preventing human exposure to groundwater contamination presenting an unacceptable risk to a future maintenance worker and ensuring that there is no withdrawal or use of groundwater from the site for anything other than environmental monitoring and testing until the cleanup levels are attained. Groundwater monitoring has been in progress at the site since May 2013, and LHAAP-67 was included as part of the sitewide Final Fourth Five-Year Review Report finalized in May 2019 (USACE 2019).

According to the Remedial Design (RD), groundwater monitoring is being performed to demonstrate that natural attenuation is an effective remedy that will attain the remediation objectives over time and that the groundwater plume will not migrate to nearby surface water bodies at levels that may present an unacceptable risk to human health and the environment (Shaw Environmental & Infrastructure, Inc. [Shaw] 2011). Groundwater monitoring is being performed in accordance with the Remedial Action Work Plan (RAWP) (AECOM 2013) to:

- Detect changes in environmental conditions that may reduce the efficacy of natural attenuation processes.
- Identify potentially toxic and/or mobile transformation products.
- Verify that the plume is not expanding and poses no unacceptable risk to downgradient receptors.
- Detect new releases of contaminants to the environment that could impact effectiveness of the natural attenuation remedy.
- Verify attainment of the remediation objectives.

Work completed as part of the 2022–2023 RA-O consisted of the following:

- Mowing and brush clearing on October 18, 2022.
- Annual LUC inspection on November 7, 2022.
- Annual groundwater monitoring event November 7–9, 2022 consisting of 17 wells; however, one well (67WW03) did not have a sufficient quantity of water to collect a sample.
- Well maintenance inspections November 7–9, 2022.

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This report summarizes the LUC compliance inspection, the results of groundwater sampling, and an evaluation of the MNA remedy.

1.3 Site Description

LHAAP-67 is in the central portion of LHAAP, as shown on **Figure 1-2**, and covers an area of approximately 1.9 acres. The site topography is relatively flat. The nearest significant surface water body is Central Creek, located approximately 870 feet southeast and upgradient of LHAAP-67. Central Creek eventually flows into Caddo Lake.

When operational, LHAAP-67 consisted of seven aboveground storage tanks (ASTs) used for storing No. 2 fuel oil, kerosene, and solvents. The size of the tanks is unknown. The tanks were surrounded by earthen dikes designed to contain potential spills. The ASTs have been removed, and the only man-made structure remaining at the site is a railroad bed.

The LUC area associated with the groundwater use restriction at LHAAP-67 extends beyond the historical site boundaries along the western, eastern, and southern sections of the site and encompasses a total of 2.6 acres. LHAAP-67 has no known areas of archaeological or historical importance.

1.4 Conceptual Site Model

A detailed Conceptual Site Model of LHAAP-67 was previously presented in the ROD (USACE 2010). Based upon additional data collected as part of final remedy implementation as presented in the LHAAP-67 Final RACR (AECOM 2016), the lithologic units at the site have been reclassified.

Historically, two distinct water-bearing zones (shallow and intermediate) had been designated at LHAAP-67; however, during drilling performed for the 2013 investigation, no continuous clay layer (i.e., aquitard) or significant lithological differences between previously identified shallow and intermediate zones were encountered. Collocated monitoring wells 67WW07 (total depth 24.0 feet below ground surface [bgs]) and 67WW06 (total depth 51 feet bgs), historically identified as shallow and intermediate zone wells, respectively, had similar static groundwater levels during the four sampling events performed during 2013–2014. Both of these monitoring wells had a maximum difference of 1.04 feet noted during the January 2014 event (these small differences were confirmed in the four 2014–2015 sampling events, with a maximum difference of 0.08 feet). Therefore, the previously designated shallow and intermediate zones are now considered to be hydraulically connected and constitute a single uppermost groundwater-bearing unit at LHAAP-67 to a depth of approximately 50 feet bgs. Therefore, monitoring well 67WW06, which was previously identified as an intermediate zone well, has been reclassified as a shallow zone monitoring well, screened in the uppermost groundwater-bearing unit. A deeper “intermediate” water-bearing zone was identified at a

depth of approximately 68 feet bgs in boring 67DPT14 (drilled in June 2014), with a clear aquitard separating this unit from the shallow zone. To assess the deeper "intermediate" water-bearing zone, 67WW16I was installed in May 2016 to a depth of 78 ft bgs. Based on this information, shallow and intermediate water-bearing zones are present in the LHAAP-67 investigation area, but the configuration has been modified from that presented in the RD based on the updated conceptual site model.

The contaminants of concern (COCs) identified in the ROD for LHAAP-67 shallow zone groundwater are trichloroethene (TCE), 1,1-dichloroethene (DCE), 1,2-dichloroethane (DCA), 1,1,1-trichloroethane (TCA), and 1,1,2-TCA. TCE has not been detected above the Maximum Contaminant Level (MCL) of 5 micrograms per liter (µg/L) since May 2016 and vinyl chloride, a degradation product of TCE, has not been detected above the detection limit of 0.5 µg/L since before May 2019. The presence of the remaining COCs in the shallow groundwater zone represents the primary driver for ongoing remedial action, as they are at concentrations above the human health standards for a hypothetical future maintenance worker under an industrial exposure scenario. No COCs have been detected in 67WW16I since the first sampling event in November 2017, confirming the June 2014 results from temporary well 67DPT14 and indicating that COCs are confined to the shallow groundwater zone.

The nature and extent of groundwater contamination at LHAAP-67 was evaluated during field investigations conducted between 1998 and 2007. It is believed that historical releases from the site ASTs contaminated the soil, with contaminants then leaching from the soil into groundwater. A relatively small area of contamination is present in the shallow groundwater which poses an unacceptable carcinogenic risk and noncarcinogenic hazard to a hypothetical future maintenance worker under an industrial exposure scenario. There is no groundwater contamination in the deeper "intermediate" groundwater zone. The only potentially complete exposure pathway is via use of the shallow groundwater zone as drinking water. However, shallow groundwater is not used as drinking water at the refuge, and the pathway is eliminated from any hypothetical receptor because LUCs are in place that prohibit the use of groundwater other than for environmental monitoring and testing. The nearest significant surface water body to the LHAAP-67 site is Central Creek, located upgradient and approximately 870 feet from the site, as shown on **Figure 1-2**. Goose Prairie Creek is located downgradient of LHAAP-67, approximately 1,400 feet to the north-northwest of the downgradient edge of the LHAAP-67 1,1-DCE plume. While groundwater flowing from the vicinity of LHAAP-67 may eventually reach Goose Prairie Creek, the presence of clean wells (67WW05, 67WW17, and 67WW18) north and northwest of the plume edge, between the site and Goose Prairie Creek, confirms that there is no complete pathway for contamination to reach Goose Prairie Creek from LHAAP-67. The current groundwater monitoring network is adequate to detect

contaminant migration towards Goose Prairie Creek should it occur. Therefore, there is not a complete pathway from groundwater to surface water.

The First Annual RA-O report indicated that the dominant shallow zone groundwater flow direction was to the north-northeast, but the flow direction began to shift by May 2014 towards the north-northwest. In 2022, the groundwater flow direction has shifted back to the north-northeast in the northern portion of the site and to the east and northeast in the southern portion of the site. Based on groundwater level data collected in November 2022, the dominant shallow zone groundwater flow direction appears to be generally northward. The groundwater levels fluctuate with seasonal precipitation, as the groundwater elevations are normally higher in most wells in the spring (May) sampling events. However, the highest water levels recorded during RA-O sampling were measured during the Year 7 May 2020 sampling event (179.20 feet above mean sea level (amsl) in 67WW10) and again during the Year 9 November 2021 sampling event (179.11 feet amsl in 67WW14). The increased water levels that were seen in 2020 and 2021 decreased by 1-2 feet on average in 2022. The historical groundwater flow direction was originally assumed to be towards the southeast in the Final RD (Shaw 2011). The groundwater potentiometric surface was based on data collected primarily from three monitoring wells because some of the wells, such as 67WW03 and 67WW04, which are screened higher than most wells that produce groundwater, were dry most of the time. Therefore, the potential discharge to surface water in Central Creek became an incomplete exposure pathway because the groundwater is flowing away from Central Creek at LHAAP-67. As stated in the RAWP and RACR, surface water sampling was no longer deemed to be necessary (AECOM 2013 and AECOM 2016).

To assess the deeper “intermediate” water-bearing zone, monitoring well 67WW16I was completed to a depth of 78 feet bgs with a screen interval of 67.4 to 77.4 feet bgs. This well has been sampled annually since 2016. No COCs have been detected, including during the most recent sampling event in November 2022. This sampling confirms that COCs are confined to the shallow zone groundwater.

In response to the Fourth Five-Year Review Report recommendation to “evaluate data in the north area of the plume to determine if temporary exceedances indicate plume migration or require extension of the plume boundary monitoring well system,” two new monitoring wells (67WW17 and 67WW18) were installed in the shallow groundwater zone in July and August 2019 (USACE 2019). These wells have been sampled four times, during the sixth through ninth annual RA-O events, and all COCs were below their respective MCLs. Therefore, the plume boundary does not extend farther to the north and is currently bounded to the north and northwest by the shallow groundwater data from these two wells. The plume is not bound to the northeast and east beyond monitoring well 67WW12 where 1,1-DCE has been detected above the MCL and additional monitoring well(s) may be required in the future.

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2.0 SITE ACTIVITIES AT LHAAP-67

This chapter describes the results of the Year 9 RA-O activities, including annual LUC compliance inspection, the fourth annual groundwater monitoring, and monitoring system repairs and/or maintenance performed at LHAAP-67.

2.1 Annual Land Use Control (LUC) Compliance Inspection

The annual LUC compliance inspection for LHAAP-67 was performed on November 7, 2022. The LUC for this site is groundwater restriction, which prohibits water well installation for any purpose other than environmental monitoring and testing and residential groundwater use until the levels of COCs in groundwater and soil allow unrestricted use and unlimited exposure. The restriction applies to groundwater underlying an approximately 6-acre area defined by the surveyed LUC boundary (AECOM 2016). The Annual LUC Compliance Certification Documentation Form for the Year 9 RA-O monitoring period is included in **Appendix A**. Noncompliance issues or concerns were not identified during the annual inspection.

2.2 Groundwater Monitoring

The Year 9 RA-O monitoring event performed in November 2022 is the fourth annual monitoring event after two years of quarterly monitoring and three years of semiannual monitoring. Groundwater samples were collected using low-flow sampling techniques as described in the groundwater sampling procedures found in the *Final Installation-Wide Work Plan* (Bhate 2018).

Sample collection logs are included in **Appendix B**. Sampling was attempted at 17 monitoring wells, which included the fourth sampling event at the two new monitoring wells, 67WW17 and 67WW18, as shown in **Table 2-1**. Monitoring well locations are depicted on **Figure 2-1**. Two additional wells (67WW04 and 67WW06) are not sampled but are gauged for groundwater elevations each year.

Prior to collecting groundwater samples, monitoring wells were gauged using a water level probe, and the depth to water was recorded to the nearest 0.01 feet from the top of casing. Depth-to-water measurements were used to calculate the groundwater elevations presented in **Table 2-2**. In November 2022, 67WW03 was dry and was not used in the development of potentiometric contours on **Figure 2-2**. Monitoring well 67WW04 (planned for groundwater elevation gauging only) continued to be dry in 2022. No other monitoring wells were dry during the November 2022 sampling event.

2.2.1 Approved Modifications to the Groundwater Monitoring Program

The following minor modifications have been made to the groundwater monitoring program since the beginning of the RA-O, in coordination with U.S. Environmental Protection Agency (USEPA) and the Texas Commission on Environmental Quality (TCEQ), since it was first developed in the RAWP (AECOM 2013):

- Monitoring wells 67WW09A and 67WW10 replaced 67WW04 to bound the plume to the south (AECOM 2017). Monitoring well 67WW04 was reduced to being gauged for water levels only during each sampling event (AECOM 2017).
- Monitoring wells 67WW06 and 67WW07 were considered duplicative, and only 67WW07 was retained for sampling (AECOM 2017). Monitoring well 67WW06 was reduced to being gauged for water levels only during each sampling event (AECOM 2017).
- Monitoring wells 67WW01 and 67WW08 were selected in the RAWP for collection of MNA geochemical parameters. Based on the lack of consistent groundwater at 67WW01 and an evaluation of COC concentrations and monitoring well locations with respect to the plume, it was determined that future sampling for MNA geochemical parameters would be conducted only at monitoring wells 67WW13 and 67WW08 (AECOM 2017).
- Surface water monitoring was discontinued for the LHAAP-67 site at Central Creek (AECOM 2016).
- Two additional monitoring wells, 67WW17 and 67WW18, were installed and added to the monitoring plan to evaluate the groundwater and bound the plume to the north and northwest of the site (USACE 2019).

2.2.2 Groundwater Elevations and Flow Direction

During the Year 9 RA-O sampling event, water levels were gauged in November 2022 and used to determine the hydraulic gradient and groundwater flow direction, as shown on **Figure 2-2**. Monitoring wells 67WW03 and 67WW04 continued to be dry in November 2022. The groundwater elevations measured at 67WW01 and 67WW09 in 2022 were anomalous relative to the nearby monitoring locations and were not used to draw the potentiometric contours. Based on the gauging data during this event, the groundwater flow direction is interpreted to be to the north and northeast, with some flow to the northwest in the western portion of the site. As previously noted, the groundwater levels have fluctuated with seasonal precipitation, with the groundwater elevations higher in the spring and lower in the fall, often below 177 feet amsl, as shown on **Figure 2-3**. This figure shows that on average, the primary pattern is the groundwater elevations have historically been approximately 1.5 feet lower in the fall than in the spring. The annual sampling that began during the Year 6 RA-O event will continue in the future and may provide more consistent groundwater water levels from event to event.

2.2.3 Groundwater Monitoring and Analytical Results

The Year 9 Annual RA-O is the fourth annual groundwater sampling event after two years of quarterly sampling and three years of semiannual sampling. Groundwater samples were collected and analyzed for volatile organic compounds (VOCs) according to SW-846 Method 8260. During the November 2022 sampling event, the amount of water was insufficient to collect for analysis at monitoring well 67WW03. Samples collected from 67WW08 and 67WW13 were analyzed for MNA geochemical parameters (**Table 2-1**).

During the annual Year 9 RA-O sampling event, VOCs were detected above their respective MCLs in monitoring wells 67WW01, 67WW02, 67WW08, 67WW12, 67WW13, and 67WW15. The highest concentration of VOCs was detected in well 67WW15, with 1,1-DCE levels at 640 µg/L.

Analytical results for the annual RA-O period are presented in **Table 2-3** and **Table 2-4**. **Table 2-3** presents the VOC and MNA data from the RA-O Year 9 (2022) annual sampling event, while **Table 2-4** presents the RA-O data from the first RA-O sampling event in 2013 through the ninth (2022) RA-O sampling event. Historical COC results, as far back as 1988 for some wells, are presented in **Table 2-5**. **Figure 2-4** depicts the VOC data for wells sampled in November 2022.

An expanded discussion on the VOCs and their distribution, including trend analysis, is included in **Section 3.1**.

Groundwater monitoring well sample collection logs for the November 2022 sampling event were completed for each monitoring well sampled and are included in **Appendix B**. Laboratory analytical results are included in **Appendix C**.

2.3 Surface Water Sampling

Surface water monitoring is not required for LHAAP-67, based on the change in the groundwater flow direction and with TCEQ and USEPA concurrence (AECOM 2017). The current northerly groundwater flow direction indicates that Central Creek, located south of the LHAAP-67 site, is upgradient from the site and surface water monitoring continues to be unnecessary.

2.4 Groundwater Monitoring System Maintenance

Inspections of the conditions and integrity of monitoring wells are conducted during each sampling event and the information is recorded on the field sampling forms. **Appendix D** includes a photographic log, which shows the condition of the wells in November 2022. Maintenance or repairs are performed as needed, based on observed conditions. During the Year 9 reporting period, no damage to well bollards, pads, or protective well casings was

observed, though greater than 50% rust was noted on the hinges for wells 67WW14 and 67WW09A. Also, only minimal encroachment of weeds or brush on the well pads was observed. Mowing of the area to control brush and weeds is conducted on a routine basis as needed to allow access to the wells. During the Year 9 RA-O, mowing of LHAAP-67 was conducted on October 18, 2022. **Table 2-6** provides a summary of the maintenance activities that were performed at the site during the Year 9 RA-O period.

2.5 Groundwater Monitoring Optimization

In accordance with the recommendation in the Fourth Five-Year Review Report (USACE 2019) and as discussed in the Year 5 RA-O, two monitoring wells, 67WW17 and 67WW18, were installed to the north and northwest of the site to evaluate the extent of the plume boundary in those directions. The two new monitoring wells were sampled in October 2019, November 2020, November 2021, and November 2022, and all the COCs were below the MCLs. These wells will continue to be sampled annually to confirm that the plume is bound in the north-northwest direction. The monitoring well network for Year 10 RA-O sampling is presented in **Table 2-7**. In accordance with the RAWP (AECOM 2013), monitoring will continue to be conducted annually until the next Five-Year Review, currently being conducted in 2023.

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3.0 NATURAL ATTENUATION EVALUATION

This chapter presents the results of the MNA remedy evaluation in accordance with the three lines of evidence discussed in the Final RD (Shaw 2011) for site COCs.

3.1 First Line of Evidence: Change in COC Concentrations

Natural attenuation is the combination of multiple mechanisms that reduce contaminant concentrations, including biodegradation, volatilization, dilution, advection, and sorption. The decrease of COC concentrations over time and distance is evidence of natural attenuation. The change in groundwater COC concentrations over time and with distance was evaluated at LHAAP-67. COC concentrations for the November 2022 sampling event are provided on **Figure 2-4** as well as in **Tables 2-3** and **2-4**. COCs exceeding their respective MCLs are highlighted. To aid in evaluating groundwater levels and COCs over time, concentration trend graphs are provided on **Figure 3-1**. The graphs were constructed for wells where current COC concentrations are greater than the MCLs. Two wells (67WW12 and 67WW14) are also included on **Figure 3-1** because COCs have fluctuated near the MCLs, and the trends continue to be evaluated. The field duplicate VOC data was used in November 2021 for monitoring well 67WW13 because the regular sample results were non-detect and the field duplicate data were more consistent with historic and 2022 data.

3.1.1 Plume Migration

Based on the general direction of groundwater flow, monitoring wells 67WW14, 67WW09A, and 67WW10 are considered upgradient background monitoring wells. Monitoring Well 67WW14 has been an important well in defining the southwestern edge of the plume as it has been an in-plume well (2019), a side gradient well (2021), and an upgradient well (2022) over the last three years. Well 67WW04 was previously used as an upgradient background well; however, it has been removed from the RA-O because it was dry during most sampling events since 2013. Monitoring wells 67WW02, 67WW05, 67WW17, and 67WW18 are downgradient monitoring wells. In-plume monitoring wells include 67WW01, 67WW08, 67WW12, 67WW13, and 67WW15. Monitoring well 67WW07 is considered a cross-gradient well. In the Year 9 RA-O event, six monitoring wells had COC concentrations above the MCLs: 67WW01, 67WW02, 67WW08, 67WW12, 67WW13, and 67WW15.

During the 2022 sampling, the overall plume shape has extended to the east as it had previously in 2019 and 2020 due to detection of 1,1-DCE above the MCL at 67WW12, as shown on **Figure 3-2**. The most notable change in the plume is that 1,1,2-TCA has been reduced to below the MCL of 5 µg/L; and therefore, the plume contour for this compound is not shown on **Figure 3-2**.

At monitoring well 67WW15, where 1,1,2-TCA concentrations have historically been above the MCL, levels decreased from 5.7 to 3.2 µg/L between 2021 and 2022. 1,1,2-TCA concentrations have fluctuated near the MCL at well 67WW13 from 5.7 µg/L in 2020 to 5.9 µg/L J in 2021, to 4.3 µg/L in 2022. Well 67WW09 was included in the 1,1,2-TCA contour area for November 2021 at 5.5 µg/L; however, concentrations in this well decreased in November 2022 to below the detection limit of 0.3 µg/L. The largest plume at LHAAP-67 is 1,1-DCE. In November 2022, the plume extended to the east to include 67WW12 as it had previously in 2019 and 2020. Although the 1,1-DCE concentrations at 67WW12 decreased in November 2021 to 6.5 µg/L (below the MCL of 7 µg/L), the levels increased again in November 2022 to 40 µg/L.

At the in-plume well, 67WW13, 1,1-DCE concentrations seasonally fluctuated, with the highest levels often detected in the fall. Since sampling is now conducted annually in the fall, the higher concentrations are anticipated to be detected. 1,1-DCE concentrations in the fall sampling events have been increasing from 320, 570, 640, and 720 µg/L in 2017, 2018, 2019, and 2020, respectively. In November 2021, 1,1-DCE concentrations decreased for the first time since 2017, from 720 µg/L in 2020 to 410 µg/L in 2021. The 1,1-DCE November 2022 concentration increased slightly to 480 µg/L. The decrease in 1,1-DCE levels from 2020 to 2021 may indicate that higher concentrations peaked in 2020 at this in-plume well. Concentrations of 1,2-DCA and 1,1,2-TCA have remained consistent. In 2022, concentrations of 1,2-DCA and 1,1,2-TCA were detected at 34 and 4.3 µg/L, respectively.

The Year 9 RA-O data indicate that contaminant concentrations are decreasing with distance, from the highest levels inside the plume towards the downgradient edge of the plume. Concentrations of 1,1-DCE decreased along the groundwater path from 67WW13 towards 67WW02 (approximately 120 feet) and then to 67WW17 (approximately 90 feet) from 480 to 100 µg/L to below the detection limit of 0.2 µg/L. At 67WW02, 1,2-DCA was detected above the MCL only once, in 2020 at a concentration of 5.5 µg/L, and was below the detection limit of 0.2 µg/L in 2022. Also at this well, 1,1-DCE decreased from 220 to 100 µg/L between 2020 and 2021 and has remained stable at 100 µg/L in 2022.

3.1.2 Trend Analysis

Mann-Kendall analysis for the Year 9 RA-O monitoring period was completed for compounds that were above the MCL in 2022 at the six wells where one or more COCs were above the MCLs. The results are presented in **Appendix E** in graphical format with statistical results presented on the bottom of the page. The GSI Mann-Kendall Tool Kit was used for this analysis. The concentrations of COCs are presented in µg/L. Half the reporting limit was used for non-detect values. For locations with field duplicate samples, the primary sample concentration was used in the trend analysis, except for the November 2021 data at 67WW13.

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At 67WW13, the field duplicate sample was used in November 2021 because all VOC data in the regular sample were non-detect and the field duplicate VOC data were more representative of the groundwater when compared to historic and 2022 data. The level of significance is calculated for each analysis and provided on the trend analysis sheet. A summary of the Mann-Kendall results is provided in **Table 3-1**. Graphical trend charts of historical COC results for all wells discussed are presented on **Figure 3-1**, and the historical COC results are provided in **Table 2-5**.

Significant Decreases

Mann-Kendall analysis identified statistically significant evidence of a decreasing trend at the following well and the text below summarizes the trend evaluation for the identified COC and well:

- **Monitoring well 67WW08—1,1-DCE.** This well is located crossgradient to the higher COC concentrations present at LHAAP-67, and the decreasing trends may be the result of natural attenuation (e.g., dilution from clean upgradient groundwater). A decreasing trend in 1,1-DCE has been observed, from 2,320 µg/L in December 2014 to 19 µg/L in November 2022, as shown on **Figure 3-1**.

Significant Increases

Mann-Kendall analysis identified statistically significant evidence of increasing trends at the following wells for the indicated COCs. Each bullet includes a discussion of the trend evaluation for the COCs with statistically significant increasing trends in the identified wells.

- **Monitoring well 67WW02—1,1-DCE.** This well is a downgradient well, and an increasing trend for 1,1-DCE continues to be observed. The consecutive non-detect values from 2013 until the last 2014 sample were removed from the Mann-Kendall analysis for this well to minimize the influence of multiple consecutive censored values on the trend analysis. Due to the six consecutive non-detect values between 2013 and 2015, the Mann-Kendall trend analysis data set begins with only one non-detect value in December 2014 and includes twelve subsequent data points to determine the trend. Removing the consecutive non-detect values from the data set did not change the outcome of the Mann-Kendall analysis. Starting in November 2020, groundwater sampling frequency has been changed from semi-annually to annually and will continue to be in the fall of each year. The concentration of 1,1-DCE has remained at 100 µg/L for two consecutive years (2021 and 2022). Concentrations have been the highest during the spring sampling events until the November 2020 sampling event, when levels increased to the highest level of 1,1-DCE at 220 µg/L as shown on **Figure 3-1**. At this well, 1,1 DCE concentrations increased from 6.9 µg/L in October 2018 to 220 µg/L in November 2020, and then decreased to 100 µg/L in November 2021, where it remained in November 2022. Due to the groundwater flow direction becoming more northerly, monitoring well

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67WW02 is now on the downgradient edge of the plume, and the trend suggests that the plume may be expanding in this direction..

- **Monitoring well 67WW12—1,1-DCE.** This well is located on the eastern edge of the plume, and during the first five years of RA-O sampling, 1,1-DCE concentrations at 67WW12 were below the MCL until levels increased in October 2019. Due to the nine non-detect values between 2013 and 2015, the Mann-Kendall trend analysis data set begins with only one non-detect value in November 2015 to minimize the influence of multiple consecutive censored values on the trend analysis and includes ten subsequent data points to determine the increasing trend. Removing the consecutive non-detect values from the data set did not change the outcome of the Mann-Kendall analysis. In November 2021, the concentrations decreased to below the MCL of 7 µg/L again; however, in November 2022, the concentration increased to 40 µg/L.
- **Monitoring well 67WW13—1,2-DCA and 1,1,2-TCA.** This well is located near the center of the contaminant plume, and 1,2-DCA concentrations were stable until the Year 6 RA-O sampling events, when an increasing trend was observed. Since May 2018, 1,2-DCA concentrations have increased from 27 to 34 µg/L in November 2022. Concentrations of 1,1,2-TCA have fluctuated near the MCL of 5 µg/L, and the level decreased from 5.9 µg/L in 2021 to 4.3 µg/L in November 2022. Since 2013, 1,1,2-TCA levels ranged from 7.66 µg/L in November 2015, to 1.99 µg/L in May 2014. The November 2022 concentrations for 1,1,2-TCA are below the MCL and show a recent decrease in concentrations; however, the overall trend is increasing.

Stable/No Trend

Mann-Kendall analysis identified a trend as either stable or no trend at the following wells for the indicated COCs. Each bullet includes a discussion of the trend evaluation for the COCs with no trend identified or stable trends in the identified wells.

- **Monitoring well 67WW01—1,1-DCE and 1,2-DCA.** The statistical trend for both 1,1-DCE and 1,2-DCA in monitoring well 67WW01 is stable. This well is located close to the center of the plume. Historically, 1,1,1-TCA and 1,1,2-TCA were detected above the MCL at this well (1998) along with their degradation daughter products 1,1-DCE and 1,2-DCA. The initial increase in daughter products 1,1-DCE and 1,2-DCA indicated that degradation was occurring. In 2016, 1,1,1-TCA and 1,1,2-TCA were reduced to or near nondetect levels. Although the statistical trend is stable, 1,1-DCE increased from 23 µg/L in November 2021 to 36 µg/L in November 2022 and 1,2-DCA increased slightly, from 3.0 µg/L in November 2021 to 3.6 µg/L in November 2022. The concentration of 1,2-DCA in 2022 was below the MCL for the second consecutive year and if the levels remain below the MCL during the next sampling event, then Mann-Kendall analysis will not be conducted.
- **Monitoring well 67WW13—1,1-DCE.** The statistical trend for 1,1-DCE in monitoring well 67WW13 is stable. This well is near the center of the contaminant plume. Over the nine years of RA-O sampling, 1,1-DCE concentrations fluctuated

from 160 µg/L in May 2018 to 720 µg/L in November 2020. The concentration increased from 410 µg/L in November 2021 to 480 µg/L in November 2022.

- **Monitoring well 67WW15—1,1-DCE, 1,2-DCA, and 1,1,2-TCA.** Monitoring well 67WW15 is located upgradient of 67WW13, and during the Year 9 RA-O, the Mann-Kendall analysis showed that concentration trends of the COCs above the MCL are stable. Concentrations of 1,1-DCE decreased from 2,460 µg/L in May 2016 to 510 µg/L in November 2017 (**Figure 3-1**). Since November 2017, concentrations have fluctuated with the seasonal groundwater until annual sampling began in 2019; however, an increase from 420 to 640 µg/L was detected between November 2021 and November 2022. Concentrations of 1,2-DCA and 1,1,2-TCA also decreased between May 2016 and November 2017 and have continued to decrease to 24 and 3.2 µg/L, respectively, for November 2022. The statistical trends of these two compounds indicate stable trends overall. The 1,1,2-TCA concentration has decreased to below the MCL of 5 µg/L for the first time in November 2022.

3.1.3 Predictive Modeling

During the Year 9 RA-O sampling event, a statistically significant decrease was calculated at one well, 67WW08. At this cross-gradient in-plume well, the decreasing trend was observed for 1,1-DCE. During the Year 8 RA-O, 1,2-DCA also showed a decreasing trend; however, the concentration was below the MCL in November 2022. To determine the estimated time to achieve the MCL for 1,1-DCE, a time-dependent attenuation rates was calculated (**Appendix F**).

A first order rate constant estimated for 1,1-DCE during the Year 9 RA-O continues to be 0.001 day^{-1}. The estimated time to reduce 1,1-DCE from 19 µg/L detected in November 2022 to the MCL of 5 µg/L is estimated to be 2.7 years. The slight increase in 1,1-DCE concentrations between November 2021 to November 2022, from 18 to 19 µg/L, has increased the estimated time to reach the MCL from 2.6 to 2.7 years. A statistically significant decrease in COCs is not occurring in other wells at LHAAP-67; therefore, degradation rates cannot be calculated to determine a time to achieve the MCL for the plume (i.e., predictive modeling by assuming some degree of degradation and degradation half-lives is not meaningful for this plume).

3.1.4 Plume Stability

Plume maps from the October 2019 through November 2022 sampling events are presented for comparison on **Figure 3-2**. 1,1,2-TCA, 1,1-DCE, and 1,2-DCA are the most widespread COCs in the shallow groundwater. Since baseline sampling in 2013, the plume has remained fairly stable, with small shifts due to seasonal groundwater elevation changes.

The most important change in plume stability observed during the Year 6 RA-O is the complete reduction of the 1,1,2-TCA plume to below the MCL at all sampled locations. Historically, the

low-level 1,1,2-TCA plume has been associated with 67WW13 and 67WW15. However, in November 2022, the concentrations in both of these wells, along with the other sampled wells at LHAAP-67, were below the 1,1,2-TCA MCL for the first time since before 2016. In November 2022, the 1,1,2-TCA concentrations at 67WW13 and 67WW15 were detected at 4.3 and 3.2 µg/L, respectively.

At downgradient well 67WW02, the 1,1-DCE concentration remained the same in 2021 and 2022 at 100 µg/L; however, levels have been fluctuating with groundwater levels, and the overall trend is increasing. In November 2020, 1,2-DCA was detected above the MCL (5 µg/L) for the first time at a concentration of 5.5 µg/L. However, in November 2021, the concentration of 1,2-DCA dropped back below the MCL and 1,2-DCA was not detected above the detection limit (0.2 µg/L) in November 2022. The three other downgradient monitoring wells, 67WW17, 67WW18, and 67WW05, were non-detect for site COCs in November 2022, thus bounding the northwestern downgradient edge of the plumes.

At cross-gradient in-plume monitoring well 67WW08, COC trends for 1,1-DCE and 1,2-DCA were evaluated during the past Annual RA-O reports. During the 2022 RA-O sampling event, only 1,1-DCE was above the MCL and was evaluated. Although a slight increase in 1,1-DCE was observed from 18 µg/L in November 2021 to 19 µg/L in November 2022, a decreasing trend continues to be observed. The decreasing trends indicate that the plume is shrinking on the eastern edge of the upgradient plume. The 1,2-DCA concentrations continued to decrease farther below the MCL of 5 µg/L to 0.61 J (estimated value) µg/L in November 2022. The decreases in COCs are attributed to primarily abiotic natural attenuation processes, including dilution from upgradient clean groundwater.

In monitoring well 67WW09, three COCs, TCE, 1,1,2-TCA and 1,2-DCA, increased to above the detection limit in November 2021 for the first time since 2015; however, in November 2022 these compounds decreased to below the detection limits of 0.2, 0.3, and 0.2 µg/L, respectively. The elevated concentrations detected in November 2021 may be an anomaly, and future sampling will further aid in this determination.

Historically, upgradient monitoring well 67WW11 contained elevated levels of 1,1-DCE. Since 2017, COCs have remained below the MCLs, which suggests that natural attenuation has decreased contaminant levels, likely due to dilution effects from upgradient groundwater.

At monitoring well 67WW12, located on the eastern edge of the plume, 1,1-DCE concentrations have fluctuated since May 2016 and increased from below the MCL in November 2021 to 40 µg/L for November 2022, which is the same concentration detected in November 2020. The fluctuations of 1,1-DCE indicate that they may be related to variations in groundwater elevations. The significantly increasing trend (Mann-Kendall) may indicate

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that the plume is migrating towards 67WW12, and an additional well to the northeast may be warranted if the concentrations remain above the MCL.

Monitoring well 67WW13, located near the center of the plume, exhibited a stable trend for 1,1-DCE and a statistically significant increasing trend for 1,2-DCA and 1,1,2-TCA. As shown on **Figure 3-1**, 1,1,2-TCA levels have fluctuated around the MCL of 5 µg/L and were below the MCL at 4.3 µg/L in November 2022. As with monitoring well 67WW15, monitoring well 67WW13 remains bounded by downgradient monitoring well 67WW17, where COCs have not been detected above MCLs.

At upgradient monitoring well 67WW14, located southwest of the LHAAP-67 contaminant plume, 1,1-DCE was above the MCL in November 2015, May 2016, and October 2019, suggesting that the western plume boundary is fluctuating, perhaps due to seasonal variations. However, COCs detected in monitoring well 67WW14 have been below the MCLs in November 2017, October 2018, November 2020, November 2021, and November 2022 (five of the last six years), indicating that the west side of the plume is stable.

Mann-Kendall analysis at in-plume monitoring well 67WW15 indicates that 1,1-DCE, 1,2-DCA, and 1,1,2-TCA concentrations are stable. However, as previously discussed, 1,1,2-TCA was detected below the MCL of 5 µg/L for the first time in November 2022.

COCs in upgradient monitoring wells 67WW09A, 67WW10, and 67WW11 have remained below the MCLs and were below detection limits in November 2021 and 2022. Cross-gradient monitoring well 67WW07 has also had concentrations below the MCLs throughout the nine-year RA-O period.

The Year 9 RA-O data suggest that the core of the plume is stable; however, the COCs present at the eastern and northern edges may be migrating. The decreasing concentrations at the upgradient well 67WW09 suggest that the plume is migrating towards the downgradient area. The overall decrease in 1,1,2-TCA means that it is degrading. Additional sampling in the future will aid in determining whether these trends continue, or additional monitoring locations will be needed to the east-northeast.

3.2 Second Line of Evidence: Geochemical Indicators

Table 2-3 includes the November 2022 geochemical indicators that are useful MNA evaluation parameters. Some geochemical indicators (dissolved oxygen (DO), oxidation-reduction potential (ORP), potential of hydrogen (pH), conductivity, turbidity, ferrous iron, and temperature) are collected in the field and recorded for all sampling events for all wells. In February 2019, the *Final Technical Memorandum – Monitored Natural Attenuation Monitoring Parameters* (Bhate 2019) updated the list of geochemical parameters to reduce

redundancy. The updated list of parameters collected at LHAAP-67 is reflected in **Table 2-3**. Groundwater samples were collected for the full list of MNA parameters analysis at two wells, 67WW08 and 67WW013.

Dissolved Oxygen

DO is the most thermodynamically favored electron acceptor used by microbes for biodegradation of organic carbon, whether natural or anthropogenic (USEPA 1998). Anaerobic bacteria, which are the primary microbes able to degrade the site COCs, generally cannot function at DO concentrations greater than about 0.5 milligrams per liter (mg/L), and hence, reductive dechlorination may not occur.

Monitoring wells 67WW01, 67WW02, 67WW08, 67WW12, 67WW13, and 67WW15 were evaluated because at least one COC is greater than the MCL. The DO concentrations during the Year 9 RA-O sampling event ranged from 0.05 to 1.06 mg/L, and four of the six wells (67WW02, 67WW08, 67WW12, and 67WW15) had a value below the 0.5 mg/L threshold, indicating that the groundwater conditions are generally reducing and are conducive to complete reductive dechlorination.

Oxidation-Reduction Potential

The ORP levels indicate the oxidative or reductive potential in the aquifer matrix and provide real-time data to determine if conditions are conducive for anaerobic biodegradation. ORP values less than 50 millivolts (mV) indicate that anaerobic conditions are present in the aquifer and acceptable for biological reductive dechlorination of chlorinated ethenes and ethanes. During the Year 9 RA-O monitoring period, the ORP measurements ranged from -30 to 286 mV. The levels measured from groundwater in the impacted wells were greater than 50 mV in all wells except for one (67WW01). The measurements in the impacted wells indicate generally oxidative conditions are present, which are not favorable for reductive dechlorination.

Nitrate

After DO has been depleted by microbes in the treatment zone, nitrate may be used as an electron acceptor for the degradation of organic carbon via denitrification and during this process it is reduced to nitrite. Nitrate levels above 1.0 mg/L may compete with reductive dechlorination (USEPA 1998). Nitrate was analyzed in monitoring wells 67WW08 and 67WW13 during the Year 9 RA-O sampling event and has historically been below 1.0 mg/L in both wells. In November 2021, the nitrate levels were detected at an estimated level of 0.0458 J mg/L in 67WW08 and 0.114 J mg/L in 67WW13, indicating that nitrate will not compete as a respiratory substrate with site COCs.

Iron Reduction

After nitrate, iron (III) (ferric iron) is used as an electron acceptor during anaerobic biodegradation of organic carbon. During this process, iron (III) is reduced to iron (II) (ferrous iron), which is soluble in water. Therefore, an increase in ferrous iron can indicate reducing groundwater conditions. Increases in ferrous iron have been measured using a field Hach spectrophotometer during RA-O sampling in monitoring wells 67WW08 and 67WW13, indicating that limited biological degradation may have been occurring. In November 2022, ferrous iron was detected at 0.66 mg/L, which is an increase from 0.28 mg/L in 2021 in 67WW08. At 67WW13, ferrous iron historically has been below 0.1 µg/L and between 2018 and 2022 has increased from below the detection limit to 0.13 mg/L. The Year 9 RA-O sampling in November 2022 indicates that ferrous iron-reducing conditions are present, which is favorable for reductive dechlorination.

Sulfate

After DO, nitrate, and iron have been depleted in the groundwater, sulfate is used as an electron acceptor and reduced to sulfide. Concentrations of sulfate greater than 20 mg/L may compete with reductive dechlorination of the site COCs. However, in many plumes with high concentrations of sulfate, reductive dechlorination still occurs (USEPA 1998). Sulfate was analyzed at monitoring wells 67WW08 and 67WW13 during the Year 9 RA-O and detected at 649 and 348 mg/L, respectively. Since RA-O sampling began at LHAAP-67, relatively high concentrations of sulfate have been observed and have not declined. Since RA-O sampling began at LHAAP-67, relatively high concentrations of sulfate have been detected. Sulfide analysis was conducted at LHAAP-67 through October 2018, and levels were consistently below the detection limit. Due to the historically low levels of sulfide, this analysis was removed and changes in sulfate levels will be used to aid in determining sulfate-reducing conditions (Bhate 2019). The sulfate analysis from the November 2022 sampling event indicate that sulfate-reducing conditions do not exist in the groundwater.

Methane

Methanogenesis occurs in highly reducing conditions and generally occurs after oxygen, nitrate, iron, and sulfate have been depleted. Methane levels above 500 µg/L are considered indicative of methanogenic conditions (USEPA 1998). Methane concentrations remain low, with the highest concentration was 2.32 J µg/L during the Year 9 RA-O at 67WW08. These methane levels suggest that methanogenic conditions are not present in the groundwater at LHAAP-67.

Total Organic Carbon

Organic carbon is utilized as an energy and hydrogen source to support the reductive dechlorination of the chlorinated COCs. Total organic carbon (TOC) concentrations greater

than 20 mg/L are considered adequate to support microbial activity (USEPA 1998). TOC was analyzed at monitoring wells 67WW08 and 67WW13 during the Year 9 RA-O sampling event and detected at 4.16 and 2.92 mg/L, respectively. The data indicate that carbon concentrations in the groundwater are not at levels sufficient to be supportive of reductive dechlorination.

pH

The pH of the groundwater has an effect on the activity of microbial populations. Microbes capable of degrading chlorinated aliphatic hydrocarbons generally prefer pH values from 6 to 8 standard units (SU) (USEPA 1998). The shallow zone groundwater pH within the plume during the Year 9 RA-O period ranged from 5.39 SU (67WW10) to 6.55 SU (67WW01). The pH levels in these wells are low to marginal for dechlorinating bacteria and would likely limit the proliferation of the microbes.

Ethene and Ethane

Ethane and ethene are the end products of the reductive dechlorination pathways for chlorinated ethanes and ethenes. During the Year 9 RA-O, 67WW08 and 67WW13 were analyzed for ethane and ethene and concentrations were below the detection limits for both compounds at both wells. In 2021, ethane and ethene concentrations were above the detection limits for the first time, suggesting an increase in daughter products; however, those concentrations may have been an anomaly. The November 2022 data do not suggest dechlorination is currently occurring.

Geochemical Indicator MNA Parameter Summary

The qualitative assessment of geochemical indicators during the Year 9 RA-O period in the shallow groundwater zone at LHAAP-67 indicates current geochemical conditions are not favorable for MNA processes via biological reduction. The presence of degradation products 1,2-DCA and 1,1-DCE suggest that limited biological degradation is occurring; however, the primary MNA processes reducing concentrations are abiotic.

3.3 Third Line of Evidence: Microbial Analysis

Analysis for the dechlorinating bacteria *Dehalococcoides sp.* (DHC) was not conducted during the Year 9 RA-O, based on the recommendation in the 2019 Five-Year Review (USACE 2019), and will not be conducted in the future. During the last sampling event for DHC in October 2018, low concentrations were detected, but the populations would not be sufficient to aid the biological degradation of site COCs.

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4.0 SUMMARY AND CONCLUSIONS

The LUC for LHAAP-67 is a groundwater restriction, and the annual LUC compliance inspection for the Year 9 RA-O period was conducted on November 7, 2022. No LUC noncompliance issues or concerns were identified during the annual inspection. Site monitoring wells were in good condition, with no maintenance other than mowing required.

VOC data and geochemical indicators were collected over the course of the monitoring period at LHAAP-67 to evaluate effectiveness of MNA as a site remedy. A tiered approach was used to evaluate the occurrence of natural attenuation in site groundwater.

An assessment of the first line of evidence included an evaluation of the groundwater flow and COC degradation trends. The groundwater flow direction at LHAAP-67 has shifted over the years. In Year 1 RA-O in 2013-2014, groundwater flowed toward the east. During the semiannual Year 3 through Year 5 RA-O sampling, groundwater levels were shown to fluctuate with seasonal precipitation, being higher in the spring and lower in the fall. During the Year 9 RA-O, the groundwater flow direction in the northern portion of the site was toward the north-northeast and in the southern portion of the plume, it was towards the east and northeast.

The Year 6 RA-O marked the change from semiannual to annual sampling and will minimize observed seasonal fluctuations for a more reliable MNA analysis. During the November 2022 sampling, groundwater levels decreased from those measured in November 2021; however, the groundwater elevations have been increasing overall since the beginning of the RA-O sampling, as shown on **Figure 2-3**.

Two monitoring wells, 67WW17 and 67WW18, were installed in August 2019 to determine the extent of the downgradient plume and were sampled for the fourth time during the Year 9 RA-O. Concentrations of COCs in these wells continue to be below the MCLs, and the monitoring wells bound the plume to the north and northwest. The COCs in upgradient monitoring wells 67WW09A, 67WW10, and 67WW11 remain below their respective MCLs and have bounded the plume in the upgradient direction.

One of the most notable changes during the Year 9 RA-O sampling in November 2022 was the reduction in concentrations of 1,1,2-TCA to below the MCL of 5 µg/L in all wells sampled at the site. At monitoring wells within the center of the plume (67WW01 and 67WW15), COC concentrations remained statistically stable. At monitoring well 67WW13, a stable trend was observed for 1,1-DCE; however, increasing trends continue to be observed for 1,2-DCA and 1,1,2-TCA. Although an increasing trend was observed for 1,1,2-TCA, levels were below the

during the Year 9 RA-O monitoring period for the fifth consecutive year. In November 2022, the highest level of 1,2-DCA was detected at 67WW13.

At monitoring well 67WW02, located at the downgradient edge of the plume, COC concentrations decreased or remained the same in November 2022. A statistically significant increasing trend continues to be observed over time; however, 1,2-DCE decreased between November 2020 and November 2021 and then remained at 100 µg/L in November 2022. The plume is bounded by the two downgradient monitoring wells, 67WW17 and 67WW18.

The western edge of the plume is evaluated using monitoring well 67WW14, where COCs have been below the MCL during the Year 4, Year 5, Year 7, Year 8, and Year 9 RA-O sampling events. During the Year 6 RA-O, 1,2-DCA increased over the MCL, suggesting that the plume may have been migrating to the west, although more recent sampling indicates that this is not occurring.

At the eastern edge of the plume, COCs at monitoring well 67WW12 were below the MCLs until the Year 6 RA-O sampling event. At this well, 1,1-DCE concentrations rose above the MCL for the first time in October 2019 and continued to increase during the Year 7 RA-O sampling, suggesting the plume may be expanding to the east. In the November 2021 sampling event, 1,1-DCE decreased to below the MCL, suggesting that the plume may be contracting on the eastern edge; however, in November 2022, the concentrations increased to the same level detected in November 2020. Concentrations above the MCL in monitoring well 67WW12 may indicate a need for a new monitoring location to bound the plume to the northeast if they continue to increase.

In cross-gradient in-plume monitoring well 67WW08, a statistically significant decreasing trend was observed for 1,1-DCE. The rate constant for 1,1-DCE at monitoring well 67WW08 was calculated at 0.001 day^{-1} based on November 2022 data, and the time to achieve the MCL of 7 µg/L is 2.7 years. This COC continues to decrease, suggesting that cleaner upgradient groundwater is migrating into this area of the plume. Using the first-order rate constant for 1,2-DCA during the Year 5 RA-O, the estimated time for levels to decrease to below the MCL was less than one year, and the concentrations have remained below the MCL since October 2019. The degradation rate calculated may be influenced by seasonal fluctuations in groundwater elevation; however, the change to annual sampling may create more reliable attenuation rates by eliminating the seasonal fluctuations from the data.

The qualitative assessment of geochemical indicators performed as the second line of evidence at LHAAP-67 indicates that the conditions in the groundwater are not reducing and are not optimal for the biological degradation processes that will degrade site COCs. Although degradation products (1,2-DCA and 1,1-DCE) have been detected in monitoring wells,

groundwater conditions within the impacted area are not favorable for complete biological reductive dechlorination of site COCs.

The third line of evidence to assess MNA is to evaluate microorganisms that demonstrate biological degradation. DHC analysis was not conducted in October 2019, based on the recommendation in the 2019 Five-Year Review (USACE 2019), and will not be conducted in the future. The last DHC analysis was conducted during the Year 5 RA-O, and concentrations were not favorable for reductive dechlorination.

The evaluation of MNA at LHAAP-67 indicates decreasing concentrations in most wells in the upgradient part of the plume may have some limited biological degradation, but the primary pathways for reductions are abiotic processes, including dispersion, dilution, sorption, and volatilization. During the Year 9 RA-O, the 1,1,2-TCA plume has been reduced to below the MCL in all wells at the site. The COC concentrations detected for the first time at the upgradient well 67WW09 in 2021 decreased in 2022 and may be an anomaly. The fluctuation of 1,1-DCE at 67WW12 will continue to be evaluated to aid in determining if the plume may be increasing on the eastern side of the plume.

The Year 10 RA-O groundwater monitoring (**Table 2-7**) will continue on an annual basis until the next Five-Year Review (currently being conducted in 2023), in compliance with the RAWP (AECOM 2013).

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Tables

Table 2-1
Groundwater Remedial Action Operation Sampling, 2022

	November 2022			
Monitoring Well ID	VOCs	Field Parameters [a]	MNA Parameters [b]	Water Levels
67WW01	X	X		X
67WW02	X	X		X
67WW03	Not sufficient amount of water to sample			Dry
67WW04 [c]	Gauge for water levels only			Dry
67WW05	X	X		X
67WW06 [d]	Gauge for water levels only			X
67WW07	X	X		X
67WW08	X	X	X	X
67WW09	X	X		X
67WW09A	X	X		X
67WW10	X	X		X
67WW11	X	X		X
67WW12	X	X		X
67WW13	X	X	X	X
67WW14	X	X		X
67WW15	X	X		X
67WW16I	X	X		X
67WW17	X	X		X
67WW18	X	X		X

Notes:

[a] Field parameters to be monitored for all wells: pH, temperature, conductivity, turbidity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and ferrous iron.

[b] MNA parameters include nitrate, sulfate, chloride, TOC, dissolved gases (methane, ethane, ethene), carbon dioxide, and dissolved iron.

[c] 67WW04 was replaced by 67WW09A and 67WW10.

[d] 67WW06 was eliminated in May 2018 due to the close proximity of 67WW07.

X - well will be analyzed for that parameter.

ID - Identifier

MNA - monitored natural attenuation

TOC - total organic carbon

VOC - volatile organic compound

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW01	05/31/13	200.92	198.21	25.55	14.68	24.68	186.24	176.24	175.37
	09/27/13	200.92	198.21	Dry	14.68	24.68	186.24	176.24	Dry
	01/23/14	200.92	198.21	Dry	14.68	24.68	186.24	176.24	Dry
	05/07/14	200.92	198.21	26.9	14.68	24.68	186.24	176.24	174.02
	07/24/14	200.92	198.21	26.20	14.68	24.68	186.24	176.24	174.72
	12/02/14	200.92	198.21	25.17	14.68	24.68	186.24	176.24	175.75
	02/10/15	200.92	198.21	25.55	14.68	24.68	186.24	176.24	175.37
	05/19/15	200.92	198.21	23.40	14.68	24.68	186.24	176.24	177.52
	11/18/15	200.92	198.21	26.17	14.68	24.68	186.24	176.24	174.75
	03/28/16	200.92	198.21	23.71	14.68	24.68	186.24	176.24	177.21
	05/18/16	200.92	198.21	23.26	14.68	24.68	186.24	176.24	177.66
	11/28/17	200.92	198.21	25.95	14.68	24.68	186.24	176.24	174.97
	05/02/18	200.92	198.21	24.00	14.68	24.68	186.24	176.24	176.92
	10/25/18	200.92	198.21	26.98	14.68	24.68	186.24	176.24	173.94
	05/03/19	200.92	198.21	22.97	14.68	24.68	186.24	176.24	177.95
	10/24/19	200.92	198.21	23.77	14.68	24.68	186.24	176.24	177.15
	11/03/20	200.92	198.21	24.77	14.68	24.68	186.24	176.24	176.15
	11/10/21	200.92	198.21	22.65	14.68	24.68	186.24	176.24	178.27
	11/08/22	200.92	198.21	24.62	14.68	24.68	186.24	176.24	176.30
67WW02	05/31/13	199.69	196.61	24.38	18.08	28.08	181.61	171.61	175.31
	09/27/13	199.69	196.61	25.28	18.08	28.08	181.61	171.61	174.41
	01/23/14	199.69	196.61	24.77	18.08	28.08	181.61	171.61	174.92
	05/06/14	199.69	196.61	27.68	18.08	28.08	181.61	171.61	172.01
	07/23/14	199.69	196.61	23.45	18.08	28.08	181.61	171.61	176.24
	12/02/14	199.69	196.61	24.13	18.08	28.08	181.61	171.61	175.56
	02/10/15	199.69	196.61	23.65	18.08	28.08	181.61	171.61	176.04
	05/11/15	199.69	196.61	22.79	18.08	28.08	181.61	171.61	176.90
	11/18/15	199.69	196.61	24.22	18.08	28.08	181.61	171.61	175.47
	05/18/16	199.69	196.61	22.58	18.08	28.08	181.61	171.61	177.11
	11/28/17	199.69	196.61	23.95	18.08	28.08	181.61	171.61	175.74
	05/03/18	199.69	196.61	24.15	18.08	28.08	181.61	171.61	175.54
	10/25/18	199.69	196.61	24.35	18.08	28.08	181.61	171.61	175.34
	05/01/19	199.69	196.61	22.42	18.08	28.08	181.61	171.61	177.27
	10/24/19	199.69	196.61	22.97	18.08	28.08	181.61	171.61	176.72
	11/03/20	199.69	196.61	21.95	18.08	28.08	181.61	171.61	177.74
	11/10/21	199.69	196.61	21.61	18.08	28.08	181.61	171.61	178.08
	11/07/22	199.69	196.61	23.10	18.08	28.08	181.61	171.61	176.59
67WW03	05/31/13	200.44	198.12	25.39	16.32	26.32	184.12	174.14	175.05
	09/27/13	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	01/23/14	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	05/06/14	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	07/23/14	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	12/02/14	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	02/10/15	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	05/11/15	200.44	198.12	22.98	16.32	26.32	184.12	174.14	177.46
	11/18/15	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	03/28/16	200.44	198.12	23.2	16.32	26.32	184.12	174.14	177.24
	05/18/16	200.44	198.12	22.76	16.32	26.32	184.12	174.14	177.68

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW03 (cont.)	11/27/17	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	05/02/18	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	10/22/18	200.44	198.12	24.95	16.32	26.32	184.12	174.14	175.49
	05/02/19	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	10/28/19	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	11/03/20	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
	11/10/21	200.44	198.12	24.84	16.32	26.32	184.12	174.14	175.60
	11/08/22	200.44	198.12	Dry	16.32	26.32	184.12	174.14	Dry
67WW04	09/27/13	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	01/23/14	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	05/06/14	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	07/25/14	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	12/02/14	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	02/10/15	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	05/11/15	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	11/18/15	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	05/16/16	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	11/27/17	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	05/02/18	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	10/25/18	203.76	200.5	24.48	14.71	24.71	189.5	179.5	179.28
	05/02/19	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	10/28/19	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	11/03/20	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	11/10/21	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
	11/19/22	203.76	200.5	Dry	14.71	24.71	189.5	179.5	Dry
67WW05	09/28/13	201	197.48	26.40	19.52	29.52	181.48	171.48	174.60
	01/23/14	201	197.48	26.00	19.52	29.52	181.48	171.48	175.00
	05/06/14	201	197.48	25.85	19.52	29.52	181.48	171.48	175.15
	07/23/14	201	197.48	25.20	19.52	29.52	181.48	171.48	175.80
	12/02/14	201	197.48	25.55	19.52	29.52	181.48	171.48	175.45
	02/10/15	201	197.48	26.20	19.52	29.52	181.48	171.48	174.80
	05/11/15	201	197.48	24.68	19.52	29.52	181.48	171.48	176.32
	11/18/15	201	197.48	25.76	19.52	29.52	181.48	171.48	175.24
	05/18/16	201	197.48	24.56	19.52	29.52	181.48	171.48	176.44
	11/28/17	201	197.48	25.6	19.52	29.52	181.48	171.48	175.40
	05/02/18	201	197.48	25.8	19.52	29.52	181.48	171.48	175.20
	10/25/18	201	197.48	25.8	19.52	29.52	181.48	171.48	175.20
	05/02/19	201	197.48	24.46	19.52	29.52	181.48	171.48	176.54
	10/24/19	201	197.48	24.72	19.52	29.52	181.48	171.48	176.28
	11/03/20	201	197.48	23.50	19.52	29.52	181.48	171.48	177.50
	11/10/21	201	197.48	23.00	19.52	29.52	181.48	171.48	178.00
	11/07/22	201	197.48	24.30	19.52	29.52	181.48	171.48	176.70
67WW06	05/31/13	200.81	196.95	25.32	41.86	51.86	158.95	148.95	175.49
	09/28/13	200.81	196.95	26.32	41.86	51.86	158.95	148.95	174.49
	01/24/14	200.81	196.95	26.61	41.86	51.86	158.95	148.95	174.20
	05/06/14	200.81	196.95	23.75	41.86	51.86	158.95	148.95	177.06
	07/23/14	200.81	196.95	23.75	41.86	51.86	158.95	148.95	177.06
	12/02/14	200.81	196.95	24.80	41.86	51.86	158.95	148.95	176.01

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW06 (cont.)	02/10/15	200.81	196.95	23.95	41.86	51.86	158.95	148.95	176.86
	05/11/15	200.81	196.95	22.38	41.86	51.86	158.95	148.95	178.43
	11/18/15	200.81	196.95	24.80	41.86	51.86	158.95	148.95	176.01
	05/18/16	200.81	196.95	22.16	41.86	51.86	158.95	148.95	178.65
	11/29/17	200.81	196.95	24.66	41.86	51.86	158.95	148.95	176.15
	05/02/18	200.81	196.95	23.18	41.86	51.86	158.95	148.95	177.63
	10/25/18	200.81	196.95	24.91	41.86	51.86	158.95	148.95	175.90
	05/03/19	200.81	196.95	21.63	41.86	51.86	158.95	148.95	179.18
	10/28/19	200.81	196.95	23.37	41.86	51.86	158.95	148.95	177.44
	11/03/20	200.81	196.95	22.12	41.86	51.86	158.95	148.95	178.69
	11/10/21	200.81	196.95	22.1	41.86	51.86	158.95	148.95	178.71
	11/18/22	200.81	196.95	24.00	41.86	51386	158.95	148.95	176.81
67WW07	05/31/13	200.84	197.04	25.35	17.8	27.8	183.04	173.04	175.49
	09/27/13	200.84	197.04	26.32	17.8	27.8	183.04	173.04	174.52
	01/23/14	200.84	197.04	25.6	17.8	27.8	183.04	173.04	175.24
	05/06/14	200.84	197.04	23.8	17.8	27.8	183.04	173.04	177.04
	07/24/14	200.84	197.04	23.83	17.8	27.8	183.04	173.04	177.01
	12/02/14	200.84	197.04	24.75	17.8	27.8	183.04	173.04	176.09
	02/10/15	200.84	197.04	24.00	17.8	27.8	183.04	173.04	176.84
	05/11/15	200.84	197.04	22.45	17.8	27.8	183.04	173.04	178.39
	11/18/15	200.84	197.04	24.84	17.8	27.8	183.04	173.04	176.00
	05/18/16	200.84	197.04	22.21	17.8	27.8	183.04	173.04	178.63
	11/29/17	200.84	197.04	24.65	17.8	27.8	183.04	173.04	176.19
	05/02/18	200.84	197.04	24.25	17.8	27.8	183.04	173.04	176.59
	10/25/18	200.84	197.04	24.94	17.8	27.8	183.04	173.04	175.90
	05/03/19	200.84	197.04	21.72	17.8	27.8	183.04	173.04	179.12
	10/28/19	200.84	197.04	23.40	17.8	27.8	183.04	173.04	177.44
	11/03/20	200.84	197.04	22.07	17.8	27.8	183.04	173.04	178.77
	11/10/21	200.84	197.04	22.16	17.8	27.8	183.04	173.04	178.68
	11/08/22	200.84	197.04	24.02	17.8	27.8	183.04	173.04	176.82
67WW08	06/03/13	200.02	197.60	24.65	26.02	50.52	174	149.5	175.37
	10/02/13	200.02	197.60	25.57	26.02	50.52	174	149.5	174.45
	01/23/14	200.02	197.60	24.9	26.02	50.52	174	149.5	175.12
	05/07/14	200.02	197.60	23.65	26.02	50.52	174	149.5	176.37
	07/24/14	200.02	197.60	23.41	26.02	50.52	174	149.5	176.61
	12/04/14	200.02	197.60	24.23	26.02	50.52	174	149.5	175.79
	02/11/15	200.02	197.60	23.46	26.02	50.52	174	149.5	176.56
	05/19/15	200.02	197.60	22.25	26.02	50.52	174	149.5	177.77
	11/19/15	200.02	197.60	24.38	26.02	50.52	174	149.5	175.64
	05/19/16	200.02	197.60	22.12	26.02	50.52	174	149.5	177.90
	11/28/17	200.02	197.60	24.00	26.02	50.52	174	149.5	176.02
	05/01/18	200.02	197.60	22.92	26.02	50.52	174	149.5	177.10
	10/23/18	200.02	197.60	24.41	26.02	50.52	174	149.5	175.61
	05/01/19	200.02	197.60	21.67	26.02	50.52	174	149.5	178.35
	10/28/19	200.02	197.60	22.85	26.02	50.52	174	149.5	177.17
	11/03/20	200.02	197.60	21.8	26.02	50.52	174	149.5	178.22
	11/10/21	200.02	197.60	21.50	26.02	50.52	174	149.5	178.52
	11/09/22	200.02	197.6	23.15	26.002	50.52	174	149.5	176.87

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW09	06/01/13	198.21	195.72	22.78	16.99	36.49	181.22	161.72	175.43
	09/28/13	198.21	195.72	23.66	16.99	36.49	181.22	161.72	174.55
	01/24/14	198.21	195.72	22.95	16.99	36.49	181.22	161.72	175.26
	05/06/14	198.21	195.72	21.52	16.99	36.49	181.22	161.72	176.69
	07/25/14	198.21	195.72	21.40	16.99	36.49	181.22	161.72	176.81
	12/04/14	198.21	195.72	22.25	16.99	36.49	181.22	161.72	175.96
	02/11/15	198.21	195.72	21.50	16.99	36.49	181.22	161.72	176.71
	05/19/15	198.21	195.72	20.30	16.99	36.49	181.22	161.72	177.91
	11/18/15	198.21	195.72	22.24	16.99	36.49	181.22	161.72	175.97
	05/18/16	198.21	195.72	20.15	16.99	36.49	181.22	161.72	178.06
	11/27/17	198.21	195.72	22.06	16.99	36.49	181.22	161.72	176.15
	05/02/18	198.21	195.72	20.95	16.99	36.49	181.22	161.72	177.26
	10/23/18	198.21	195.72	22.43	16.99	36.49	181.22	161.72	175.78
	05/03/19	198.21	195.72	19.83	16.99	36.49	181.22	161.72	178.38
	10/24/19	198.21	195.72	20.78	16.99	36.49	181.22	161.72	177.43
	11/03/20	198.21	195.72	19.85	16.99	36.49	181.22	161.72	178.36
	11/10/21	198.21	195.72	19.54	16.99	36.49	181.22	161.72	178.67
	11/08/22	198.21	195.72	21.78	16.99	36.49	181.22	161.72	176.43
67WW09A	09/27/13	202.93	200.4	28.4	23.33	38.03	179.6	164.9	174.53
	01/23/14	202.93	200.4	27.65	23.33	38.03	179.6	164.9	175.28
	05/06/14	202.93	200.4	26.1	23.33	38.03	179.6	164.9	176.83
	07/24/14	202.93	200.4	26.06	23.33	38.03	179.6	164.9	176.87
	12/03/14	202.93	200.4	27.00	23.33	38.03	179.6	164.9	175.93
	02/10/15	202.93	200.4	26.11	23.33	38.03	179.6	164.9	176.82
	05/12/15	202.93	200.4	24.97	23.33	38.03	179.6	164.9	177.96
	11/18/15	202.93	200.4	26.97	23.33	38.03	179.6	164.9	175.96
	05/18/16	202.93	200.4	24.61	23.33	38.03	179.6	164.9	178.32
	11/29/17	202.93	200.4	26.81	23.33	38.03	179.6	164.9	176.12
	05/03/18	202.93	200.4	25.78	23.33	38.03	179.6	164.9	177.15
	10/25/18	202.93	200.4	27.02	23.33	38.03	179.6	164.9	175.91
	05/02/19	202.93	200.4	24.35	23.33	38.03	179.6	164.9	178.58
	10/28/19	202.93	200.4	25.5	23.33	38.03	179.6	164.9	177.43
	11/03/20	202.93	200.4	24.72	23.33	38.03	179.6	164.9	178.21
	11/10/21	202.93	200.4	24.33	23.33	38.03	179.6	164.9	178.60
	11/9/2022	202.93	200.4	26.02	23.33	38.03	179.6	164.9	176.91
67WW10	06/01/13	201.51	198.8	26.1	22.71	52.21	178.8	149.3	175.41
	09/27/13	201.51	198.8	27.03	22.71	52.21	178.8	149.3	174.48
	01/24/14	201.51	198.8	26.22	22.71	52.21	178.8	149.3	175.29
	05/06/14	201.51	198.8	24.4	22.71	52.21	178.8	149.3	177.11
	07/24/14	201.51	198.8	24.42	22.71	52.21	178.8	149.3	177.09
	12/03/14	201.51	198.8	25.58	22.71	52.21	178.8	149.3	175.93
	02/10/15	201.51	198.8	24.55	22.71	52.21	178.8	149.3	176.96
	05/12/15	201.51	198.8	23.10	22.71	52.21	178.8	149.3	178.41
	11/18/15	201.51	198.8	25.49	22.71	52.21	178.8	149.3	176.02
	05/18/16	201.51	198.8	22.73	22.71	52.21	178.8	149.3	178.78
	11/29/17	201.51	198.8	25.35	22.71	52.21	178.8	149.3	176.16
	05/03/18	201.51	198.8	23.77	22.71	52.21	178.8	149.3	177.74
	10/22/18	201.51	198.8	25.65	22.71	52.21	178.8	149.3	175.86

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW10 (cont.)	05/02/19	201.51	198.8	22.31	22.71	52.21	178.8	149.3	179.20
	10/28/19	201.51	198.8	24.07	22.71	52.21	178.8	149.3	177.44
	11/03/20	201.51	198.8	23.2	22.71	52.21	178.8	149.3	178.31
	11/10/21	201.51	198.8	22.82	22.71	52.21	178.8	149.3	178.69
	11/09/22	201.51	198.8	24.59	22.71	52.21	178.8	149.3	176.92
67WW11	06/01/13	199.64	197.21	24.21	22.93	47.43	176.71	152.21	175.43
	10/02/13	199.64	197.21	25.17	22.93	47.43	176.71	152.21	174.47
	01/23/14	199.64	197.21	24.45	22.93	47.43	176.71	152.21	175.19
	05/06/14	199.64	197.21	22.86	22.93	47.43	176.71	152.21	176.78
	07/24/14	199.64	197.21	23.89	22.93	47.43	176.71	152.21	175.75
	12/04/14	199.64	197.21	23.77	22.93	47.43	176.71	152.21	175.87
	02/11/15	199.64	197.21	23.95	22.93	47.43	176.71	152.21	175.69
	05/19/15	199.64	197.21	21.67	22.93	47.43	176.71	152.21	177.97
	11/19/15	199.64	197.21	23.91	22.93	47.43	176.71	152.21	175.73
	05/19/16	199.64	197.21	22.48	22.93	47.43	176.71	152.21	177.16
	11/27/17	199.64	197.21	23.53	22.93	47.43	176.71	152.21	176.11
	05/02/18	199.64	197.21	22.37	22.93	47.43	176.71	152.21	177.27
	10/23/18	199.64	197.21	23.95	22.93	47.43	176.71	152.21	175.69
	05/01/19	199.64	197.21	21.21	22.93	47.43	176.71	152.21	178.43
	10/24/19	199.64	197.21	22.28	22.93	47.43	176.71	152.21	177.36
	11/03/20	199.64	197.21	21.3	22.93	47.43	176.71	152.21	178.34
	11/10/21	199.64	197.21	21.02	22.93	47.43	176.71	152.21	178.62
	11/08/22	199.64	197.21	22.73	22.93	47.43	176.71	152.21	176.91
67WW12	06/01/13	201.65	199.07	26.46	26.58	36.08	175.07	165.57	175.19
	10/01/13	201.65	199.07	24.4	26.58	36.08	175.07	165.57	177.25
	01/24/14	201.65	199.07	26.8	26.58	36.08	175.07	165.57	174.85
	05/06/14	201.65	199.07	25.43	26.58	36.08	175.07	165.57	176.22
	07/25/14	201.65	199.07	25.30	26.58	36.08	175.07	165.57	176.35
	12/03/14	201.65	199.07	26.12	26.58	36.08	175.07	165.57	175.53
	02/10/15	201.65	199.07	25.35	26.58	36.08	175.07	165.57	176.30
	05/12/15	201.65	199.07	24.50	26.58	36.08	175.07	165.57	177.15
	11/18/15	201.65	199.07	26.16	26.58	36.08	175.07	165.57	175.49
	05/18/16	201.65	199.07	24.16	26.58	36.08	175.07	165.57	177.49
	11/29/17	201.65	199.07	26.03	26.58	36.08	175.07	165.57	175.62
	05/03/18	201.65	199.07	24.85	26.58	36.08	175.07	165.57	176.80
	10/22/18	201.65	199.07	26.30	26.58	36.08	175.07	165.57	175.35
	05/02/19	201.65	199.07	23.85	26.58	36.08	175.07	165.57	177.80
	10/28/19	201.65	199.07	24.87	26.58	36.08	175.07	165.57	176.78
	11/03/20	201.65	199.07	23.85	26.58	36.08	175.07	165.57	177.80
	11/10/21	201.65	199.07	23.45	26.58	36.08	175.07	165.57	178.20
	11/08/22	201.65	199.07	25.13	26.58	36.08	175.07	165.57	176.52
67WW13	05/31/13	197.92	195.85	22.55	12.57	27.07	185.35	170.85	175.37
	10/01/13	197.92	195.85	23.42	12.57	27.07	185.35	170.85	174.50
	01/24/14	197.92	195.85	22.68	12.57	27.07	185.35	170.85	175.24
	05/06/14	197.92	195.85	21.66	12.57	27.07	185.35	170.85	176.26
	07/25/14	197.92	195.85	21.55	12.57	27.07	185.35	170.85	176.37
	12/04/14	197.92	195.85	22.22	12.57	27.07	185.35	170.85	175.70
	02/11/15	197.92	195.85	21.61	12.57	27.07	185.35	170.85	176.31

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW13 (cont.)	05/19/15	197.92	195.85	20.55	12.57	27.07	185.35	170.85	177.37
	11/18/15	197.92	195.85	22.22	12.57	27.07	185.35	170.85	175.70
	05/19/16	197.92	195.85	20.40	12.57	27.07	185.35	170.85	177.52
	11/28/17	197.92	195.85	21.98	12.57	27.07	185.35	170.85	175.94
	05/01/18	197.92	195.85	21.10	12.57	27.07	185.35	170.85	176.82
	10/23/18	197.92	195.85	22.38	12.57	27.07	185.35	170.85	175.54
	05/01/19	197.92	195.85	20.18	12.57	27.07	185.35	170.85	177.74
	10/28/19	197.92	195.85	20.95	12.57	27.07	185.35	170.85	176.97
	11/03/20	197.92	195.85	19.90	12.57	27.07	185.35	170.85	178.02
	11/10/21	197.92	195.85	19.60	12.57	27.07	185.35	170.85	178.32
	11/09/22	197.92	195.85	21.05	12.57	27.07	185.35	170.85	176.87
67WW14	10/01/13	196.96	194.52	21.8	14.44	29.44	182.52	167.52	175.16
	01/24/14	196.96	194.52	21.47	14.44	29.44	182.52	167.52	175.49
	05/07/14	196.96	194.52	20.58	14.44	29.44	182.52	167.52	176.38
	07/25/14	196.96	194.52	20.25	14.44	29.44	182.52	167.52	176.71
	12/03/14	196.96	194.52	20.85	14.44	29.44	182.52	167.52	176.11
	02/10/15	196.96	194.52	20.40	14.44	29.44	182.52	167.52	176.56
	05/12/15	196.96	194.52	19.64	14.44	29.44	182.52	167.52	177.32
	11/18/15	196.96	194.52	20.81	14.44	29.44	182.52	167.52	176.15
	05/18/16	196.96	194.52	19.4	14.44	29.44	182.52	167.52	177.56
	11/27/17	196.96	194.52	20.51	14.44	29.44	182.52	167.52	176.45
	05/02/18	196.96	194.52	19.9	14.44	29.44	182.52	167.52	177.06
	10/22/18	196.96	194.52	20.85	14.44	29.44	182.52	167.52	176.11
	05/02/19	196.96	194.52	18.78	14.44	29.44	182.52	167.52	178.18
	10/24/19	196.96	194.52	19.37	14.44	29.44	182.52	167.52	177.59
	11/03/20	196.96	194.52	18.57	14.44	29.44	182.52	167.52	178.39
	11/10/21	196.96	194.52	17.85	14.44	29.44	182.52	167.52	179.11
	11/07/22	196.96	194.52	19.45	14.44	29.44	185.52	167.52	177.51
67WW15	05/19/16	199.82	197.24	22.18	36.78	46.48	163.04	153.34	177.64
	11/27/17	199.82	197.24	23.85	36.78	46.48	163.04	153.34	175.97
	05/02/18	199.82	197.24	23.00	36.78	46.48	163.04	153.34	176.82
	10/23/18	199.82	197.24	24.23	36.78	46.48	163.04	153.34	175.59
	05/03/19	199.82	197.24	22.04	36.78	46.48	163.04	153.34	177.78
	10/24/19	199.82	197.24	22.72	36.78	46.48	163.04	153.34	177.10
	11/03/20	199.82	197.24	21.71	36.78	46.48	163.04	153.34	178.11
	11/10/21	199.82	197.24	21.40	36.78	46.48	163.04	153.34	178.42
	11/08/22	199.82	197.24	22.80	36.78	46.48	163.04	153.34	177.02
67WW16I	05/18/16	199.51	197.12	21.95	70.09	79.79	129.42	119.72	177.56
	11/29/17	199.51	197.12	24.81	70.09	79.79	129.42	119.72	174.70
	05/03/18	199.51	197.12	22.75	70.09	79.79	129.42	119.72	176.76
	10/25/18	199.51	197.12	24.03	70.09	79.79	129.42	119.72	175.48
	05/01/19	199.51	197.12	21.8	70.09	79.79	129.42	119.72	177.71
	10/24/19	199.51	197.12	22.69	70.09	79.79	129.42	119.72	176.82
	11/03/20	199.51	197.12	21.67	70.09	79.79	129.42	119.72	177.84
	11/10/21	199.51	197.12	21.43	70.09	79.79	129.42	119.72	178.08
	11/08/22	199.51	197.12	22.95	70.09	79.79	129.42	119.72	176.56

Table 2-2
Groundwater Elevation Data

Well ID	Sampling Date	Top of Casing Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Groundwater Elevation (ft MSL)
					Top	Bottom	Top	Bottom	
67WW17	10/24/19	199.73	196.33	23.65	20.40	30.40	179.33	169.33	176.08
	11/03/20	199.73	196.33	22.48	20.40	30.40	179.33	169.33	177.25
	11/10/21	199.73	196.33	22.23	20.40	30.40	179.33	169.33	177.50
	11/07/22	199.73	196.33	23.42	20.4	30.4	179.33	169.33	176.31
67WW18	10/24/19	198.9	195.29	23.55	32.61	42.61	166.29	156.29	175.35
	11/03/20	198.9	195.29	21.49	32.61	42.61	166.29	156.29	177.41
	11/10/21	198.9	195.29	21.05	32.61	42.61	166.29	156.29	177.85
	11/08/22	198.9	195.29	22.42	32.61	42.61	166.29	156.29	176.48

Notes:

Elevations are reported as feet above mean sea level (ft MSL).

[a] Screen information calculated from Data Gap Investigation Report (Shaw 2007).

[b] Screen information calculated from well construction detail forms.

[c] Well screen top and bottom depths and elevations for monitoring wells 67WW01, 67WW02, and 67WW03 were revised/confirmed with a downhole camera survey performed in March 2015.

[d] Monitoring wells 67WW01, 67WW02, and 67WW08 were re-surveyed in September 2016 and elevations in the table for these wells are based on the re-survey results.

[e] Intermediate zone monitoring well.

[f] Monitoring wells 67WW04 and 67WW06 were gauged for groundwater elevation only and not sampled during the November 2022 ninth annual RA-O event.

Dry - insufficient or no water in well.

ft - feet

ID - identification

MSL - mean sea level

TOC - top of casing

Table 2-3
Groundwater Results, November 2022

		Location Code	67WW01		67WW02		67WW05		67WW07		67WW08				67WW09		67WW09A		67WW10	
		Sample ID	67WW01-221108		67WW02-221107		67WW05-221107		67WW07-221108		67WW08-221109		67WW08-221109-FD		67WW09-221108		67WW09A-221109		67WW10-221109	
		Sample Date	11/8/2022		11/7/2022		11/7/2022		11/8/2022		11/9/2022		11/9/2022		11/8/2022		11/9/2022		11/9/2022	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	SDWA MCL-GW	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
FIELD TESTS																				
Dissolved oxygen	mg/L	NV	1.06		0.07		0.67		0.2		0.05				0.04		0.04		0.03	
Ferrous Iron	mg/L	NV	1.5		0.94		3.42		2.89		0.66				0.09		0.05		3.92	
Oxidation Reduction Potential	mV	NV	-30		89		-9		14		76				217		61		92	
pH	SU	NV	6.55		6.29		6.09		6.41		6.02				6.13		6.32		5.39	
Specific conductivity	µmhos/cm	NV	3.72		4.54		2.64		2.43		6.71				3.02		4.76		5.12	
Temperature	C	NV	20.27		24.01		20.58		20.05		19.64				20.18		19.65		19.26	
Turbidity	NTU	NV	134		333		87.2		141		0				0		23.2		122	
GASES																				
Carbon dioxide	µg/L	NV									81,000		90,000							
Ethane	µg/L	NV									< 0.144	U	< 0.144	U						
Ethylene	µg/L	NV									< 0.234	UJ	< 0.234	UJ						
Methane	µg/L	NV									2.32	J	< 0.107	UJ						
ANIONS																				
Chloride	mg/L	NV									2,190		2,120							
Nitrate	mg/L	10									0.0458	J	0.0492	J						
Sulfate	mg/L	NV									649		629							
TOTAL ORGANIC CARBON																				
Total organic carbon	mg/L	NV									4.16		4.42							
VOLATILES																				
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,1,1-Trichloroethane	µg/L	200	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,1-Dichloroethane	µg/L	10,000	1.3		4.5		< 0.2	U	< 0.2	U	5.3		5.2		< 0.2	U	< 0.2	U	< 0.2	U
1,1-Dichloroethene	µg/L	7	36		100		< 0.2	U	< 0.2	U	19		20		< 0.2	U	< 0.2	U	< 0.2	U
1,1-Dichloropropene	µg/L	2.9	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
1,2,3-Trichloropropane	µg/L	0.0041	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,2-Dibromoethane	µg/L	0.005	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	3.6		< 0.2	U	< 0.2	U	< 0.2	U	0.61	J	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
1,3-Dichloropropane	µg/L	29	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,4-Dichlorobenzene	µg/L	75	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
2,2-Dichloropropane	µg/L	42	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
2-Butanone	µg/L	61,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Chlorotoluene	µg/L	2,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U

Table 2-3
Groundwater Results, November 2022

		Location Code	67WW01		67WW02		67WW05		67WW07		67WW08				67WW09		67WW09A		67WW10	
		Sample ID	67WW01-221108		67WW02-221107		67WW05-221107		67WW07-221108		67WW08-221109		67WW08-221109-FD		67WW09-221108		67WW09A-221109		67WW10-221109	
		Sample Date	11/8/2022		11/7/2022		11/7/2022		11/8/2022		11/9/2022		11/9/2022		11/8/2022		11/9/2022		11/9/2022	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	SDWA MCL-GW	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
2-Hexanone	µg/L	6,100	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Acetone	µg/L	92,000	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Benzene	µg/L	5	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Bromobenzene	µg/L	2,000	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Bromochloromethane	µg/L	4,100	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Bromodichloromethane	µg/L	4.6	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Bromoform	µg/L	36	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Bromomethane	µg/L	140	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Carbon disulfide	µg/L	10,000	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Chloroethane	µg/L	41,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Chloroform	µg/L	1,000	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Chloromethane	µg/L	220	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
cis-1,2-Dichloroethene	µg/L	70	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Dibromochloromethane	µg/L	34	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Dibromomethane	µg/L	380	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Dichlorodifluoromethane	µg/L	20,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Ethylbenzene	µg/L	700	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Hexachlorobutadiene	µg/L	20	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	1,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
m,p-Xylene	µg/L	NV	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Methyl isobutyl ketone	µg/L	8,200	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U
Methylene chloride	µg/L	5	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Naphthalene	µg/L	2,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
n-Butylbenzene	µg/L	4,100	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
n-Propylbenzene	µg/L	4,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
o-Xylene	µg/L	10,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
p-Isopropyltoluene	µg/L	10,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
sec-Butylbenzene	µg/L	4,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Styrene	µg/L	100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
tert-Butylbenzene	µg/L	4,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Tetrachloroethene	µg/L	5	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Toluene	µg/L	1,000	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
trans-1,2-Dichloroethene	µg/L	100	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
trans-1,3-Dichloropropene	µg/L	29	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Trichloroethene	µg/L	5	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Trichlorofluoromethane	µg/L	31,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Vinyl chloride	µg/L	2	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U

Table 2-3
Groundwater Results, November 2022

		Location Code	67WW11		67WW12		67WW13		67WW14		67WW15		67WW16I				67WW17		67WW18	
		Sample ID	67WW11-221108		67WW12-221108		67WW13-221109		67WW14-221107		67WW15-221108		67WW16I-221108		67WW16I-221108-FD		67WW17-221107		67WW18-221107	
		Sample Date	11/8/2022		11/8/2022		11/9/2022		11/7/2022		11/8/2022		11/8/2022		11/8/2022		11/7/2022		11/7/2022	
		Sample Purpose	REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	SDWA MCL-GW	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
FIELD TESTS																				
Dissolved oxygen	mg/L	NV	0.06		0.15		0.69		0.03		0.27		0.16				0.52		0.27	
Ferrous Iron	mg/L	NV	0.08		0.27		0.13		0.51		0.06		3.86				0.09		0.04	
Oxidation Reduction Potential	mV	NV	196		76		103		83		286		-27				87		82	
pH	SU	NV	6.27		6.27		6.4		5.65		5.93		5.89				6.46		6.38	
Specific conductivity	µmhos/cm	NV	4.72		4.48		4.95		1.87		1.96		1.43				3.22		1.27	
Temperature	C	NV	19.88		19.83		20.36		21.54		19.85		19.57				21.29		22	
Turbidity	NTU	NV	0		0		0		0		0		23.3				0		0	
GASES																				
Carbon dioxide	µg/L	NV					80,000	J												
Ethane	µg/L	NV					< 0.144	U												
Ethylene	µg/L	NV					< 0.234	UJ												
Methane	µg/L	NV					< 0.107	UJ												
ANIONS																				
Chloride	mg/L	NV					1,460													
Nitrate	mg/L	10					0.114	J												
Sulfate	mg/L	NV					348													
TOTAL ORGANIC CARBON																				
Total organic carbon	mg/L	NV					2.92													
VOLATILES																				
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,1,1-Trichloroethane	µg/L	200	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.3	U	< 0.3	U	4.3		< 0.3	U	3.2		< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,1-Dichloroethane	µg/L	10,000	< 0.2	U	< 0.2	U	25		< 0.2	U	9.9		< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,1-Dichloroethene	µg/L	7	< 0.2	U	40		480		1.2		640		< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,1-Dichloropropene	µg/L	2.9	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
1,2,3-Trichloropropane	µg/L	0.0041	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,2-Dibromoethane	µg/L	0.005	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 0.2	U	< 0.2	U	34		< 0.2	U	24		< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
1,3-Dichloropropane	µg/L	29	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
1,4-Dichlorobenzene	µg/L	75	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
2,2-Dichloropropane	µg/L	42	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
2-Butanone	µg/L	61,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Chlorotoluene	µg/L	2,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U

Table 2-3
Groundwater Results, November 2022

		Location Code	67WW11		67WW12		67WW13		67WW14		67WW15		67WW16I				67WW17		67WW18	
		Sample ID	67WW11-221108		67WW12-221108		67WW13-221109		67WW14-221107		67WW15-221108		67WW16I-221108		67WW16I-221108-FD		67WW17-221107		67WW18-221107	
		Sample Date	11/8/2022		11/8/2022		11/9/2022		11/7/2022		11/8/2022		11/8/2022		11/8/2022		11/7/2022		11/7/2022	
		Sample Purpose	REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	SDWA MCL-GW	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
2-Hexanone	µg/L	6,100	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Acetone	µg/L	92,000	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Benzene	µg/L	5	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Bromobenzene	µg/L	2,000	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Bromochloromethane	µg/L	4,100	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Bromodichloromethane	µg/L	4.6	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Bromoform	µg/L	36	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Bromomethane	µg/L	140	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Carbon disulfide	µg/L	10,000	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U	< 0.6	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Chloroethane	µg/L	41,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Chloroform	µg/L	1,000	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Chloromethane	µg/L	220	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
cis-1,2-Dichloroethene	µg/L	70	< 0.2	U	< 0.2	U	1.2		< 0.2	U	1		< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Dibromochloromethane	µg/L	34	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Dibromomethane	µg/L	380	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Dichlorodifluoromethane	µg/L	20,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Ethylbenzene	µg/L	700	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Hexachlorobutadiene	µg/L	20	< 1	U	< 1	U	< 1	UJ	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	1,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
m,p-Xylene	µg/L	NV	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Methyl isobutyl ketone	µg/L	8,200	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U	< 0.7	U
Methylene chloride	µg/L	5	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	3.3		< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
Naphthalene	µg/L	2,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
n-Butylbenzene	µg/L	4,100	< 0.4	U	< 0.4	U	< 0.4	UJ	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U	< 0.4	U
n-Propylbenzene	µg/L	4,100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
o-Xylene	µg/L	10,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
p-Isopropyltoluene	µg/L	10,000	< 0.3	U	< 0.3	U	< 0.3	UJ	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
sec-Butylbenzene	µg/L	4,100	< 0.3	U	< 0.3	U	< 0.3	UJ	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Styrene	µg/L	100	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
tert-Butylbenzene	µg/L	4,100	< 0.3	U	< 0.3	U	< 0.3	UJ	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Tetrachloroethene	µg/L	5	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Toluene	µg/L	1,000	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
trans-1,2-Dichloroethene	µg/L	100	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
trans-1,3-Dichloropropene	µg/L	29	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Trichloroethene	µg/L	5	< 0.2	U	< 0.2	U	2.1	J	< 0.2	U	1.4		< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U
Trichlorofluoromethane	µg/L	31,000	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U	< 0.3	U
Vinyl chloride	µg/L	2	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U

Table 2-3
Groundwater Results, November 2022

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

µmhos/cm - micromhos per centimeter

µS/cm - microsiemens per centimeter

°C - degrees Celsius

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

cells/mL - cells per milliliter

CEQ/mL - cell equivalence per milliliter

FD - field duplicate

GW-Ind - groundwater medium-specific concentration for industrial use

ID - identifier

MCL - maximum contaminant level

mg/L - milligrams per liter

mS/cm - millisiemens per centimeter

mV - millivolts

NTU - nephelometric turbidity unit

NV - no value established

REG - regular sample

SU - standard unit

Val Qual - validation qualifier

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW01																							
		Sample ID	67WW01-130430		67WW01-050113		67WW01-130531		67WW01-053113		67WW01-130927		67WW01-140123		67WW01-050714		67WW01-140507		67WW01-140725		67WW01-072514		67WW01-141203		67WW01-120314		67WW01-150210	
		Sample Date	4/30/2013		5/1/2013		5/31/2013		5/31/2013		9/27/2013		1/23/2014		5/7/2014		5/7/2014		7/25/2014		7/25/2014		12/3/2014		12/3/2014		2/10/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV													981													
Nitrate	mg/L	10													< 1	U												
Nitrite	mg/L	1													< 1	U												
Sulfate	mg/L	NV													167													
Sulfide	mg/L	NV													< 1	U												
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV													23.4													
Total Organic Carbon	mg/L	NV													5.25													
DHC																												
BVC	cells/mL	NV													0.5	U												
Dehalococcoides	cells/mL	NV													4.7													
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	3.74				3.41		3.41		-	-	-	-	3.57		3.57		3.57		3.57		3.69		3.69		3.36	
Dissolved oxygen	mg/L	NV	2.33				8.62		8.62		-	-	-	-	8.81		8.81		8.79		8.79		-	-			-	-
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	0				15		15		-	-	-	-	85		85		107		107		-13		-13		-101	
pH	SU	NV	5.57				5.84		5.84		-	-	-	-	5.52		5.52		5.91		5.91		6.15		6.15		6.92	
Temperature	C	NV	19.98				28		28			-		-	19.77		19.77		21.9		21.9		17.6		17.6		18.85	
Total Purge	L	NV																										
Turbidity	NTU	NV	116				69.6		69.6		-	-	-	-	36.6		36.6		33		33		23.3		23.3		194	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV													< 2	U												
Ethylene	µg/L	NV													< 2	U												
Methane	µg/L	NV													33.5													
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV													5.69													
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26			4.15																							
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14							< 1	U					< 0.4	U					< 0.4	U			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5							< 1	U					< 0.5	U					0.29	J			0.483	J		
1,1-Dichloroethane	µg/L	10,000							6.37						11						9.2				14.9			
1,1-Dichloroethene	µg/L	7							139						257						224				349			
1,1-Dichloropropene	µg/L	3							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310							< 1	U					< 0.3	U					< 0.3	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04							< 2	U					< 1	U					< 1	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70							< 1	U					< 0.4	U					< 0.4	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2							< 5	U					< 2	U					< 2	U			< 2	U		
1,2-Dibromoethane	µg/L	0.1							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5							6.68						12.2						10.7				16.6			
1,2-Dichloropropane	µg/L	5							< 1	U					< 0.4	U					< 0.4	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW01																							
		Sample ID	67WW01-130430		67WW01-050113		67WW01-130531		67WW01-053113		67WW01-130927		67WW01-140123		67WW01-050714		67WW01-140507		67WW01-140725		67WW01-072514		67WW01-141203		67WW01-120314		67WW01-150210	
		Sample Date	4/30/2013		5/1/2013		5/31/2013		5/31/2013		9/27/2013		1/23/2014		5/7/2014		5/7/2014		7/25/2014		7/25/2014		12/3/2014		12/3/2014		2/10/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29							< 1	U					< 0.4	U					< 0.4	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
2-Butanone	µg/L	61,000							< 10	U					< 5	U					< 5	U			< 5	U		
2-Chlorotoluene	µg/L	2,000							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
2-Hexanone	µg/L	6,100							< 10	U					< 5	U					< 5	U			< 5	U		
4-Chlorotoluene	µg/L	2,000							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Acetone	µg/L	92,000							< 10	U					< 5	U					< 5	U			< 5	U		
Benzene	µg/L	5							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
Bromobenzene	µg/L	2,000							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
Bromochloromethane	µg/L	4,100							< 1	U					< 0.4	U					< 0.4	U			< 0.4	U		
Bromodichloromethane	µg/L	5							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Bromoform	µg/L	36							< 2	U					< 1	U					< 1	U			< 1	U		
Bromomethane	µg/L	140							< 2	U					< 1	U					< 1	U			< 1	U		
Carbon disulfide	µg/L	10,000							< 2	U					< 1	U					< 1	U			< 1	U		
Carbon tetrachloride	µg/L	5							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	100							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
Chloroethane	µg/L	41,000							< 2	U					< 1	U					< 1	U			< 1	U		
Chloroform	µg/L	1,000							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
Chloromethane	µg/L	220							< 2	U					< 1	U					< 1	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70							1.12						1.29						1.02				1.26			
cis-1,3-Dichloropropene	µg/L	5							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	34							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	380							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	700							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000							< 2	U					< 1	U					< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200							< 10	U					< 5	U					< 5	U			< 5	U		
Methylene chloride	µg/L	5							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Naphthalene	µg/L	2,000							< 1	U					< 0.4	U					< 0.4	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
o-Xylene	µg/L	10,000							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Styrene	µg/L	100							< 1	U					< 0.25	U					< 0.25	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Toluene	µg/L	1,000							< 1	U					< 0.5	U					0.473	J			0.398	J		
trans-1,2-Dichloroethene	µg/L	100							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29							< 2	U					< 1	U					< 1	U			< 1	U		
Trichloroethene	µg/L	5							2.96						3						2.3				3.36			
Trichlorofluoromethane	µg/L	31,000							< 1	U					< 0.5	U					< 0.5	U			< 0.5	U		
Vinyl chloride	µg/L	2							2.18						2.15						1.16				2.16			

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW01																							
		Sample ID	67WW01-021015		67WW01-150519		67WW01-051915		67WW01-151119		67WW01-111915		67WW01-151215		67WW01-160329		67WW01-032916		67WW01-160519		67WW01-051916		67WW01-112817		67WW01-180503		67WW01-181025	
		Sample Date	2/10/2015		5/19/2015		5/19/2015		11/19/2015		11/19/2015		12/15/2015		3/29/2016		3/29/2016		5/19/2016		5/19/2016		11/28/2017		5/3/2018		10/25/2018	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV					988																					
Nitrate	mg/L	10					< 1	U																				
Nitrite	mg/L	1					2.02																					
Sulfate	mg/L	NV					143																					
Sulfide	mg/L	NV					< 1	U																				
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV					42.6																					
Total Organic Carbon	mg/L	NV					12.7																					
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	3.36		3.2		3.2		3.95		3.95			-	3.8		3.8		3.9		3.9		3.77		3.37			
Dissolved oxygen	mg/L	NV			-	-			-	-			-	-	-	-			-	-			6.95		9.14			
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																							0			
Measured well depth	Ft BTOC	NV																					27		27		27	
Oxidation Reduction Potential	mV	NV	-101		-52		-52		-	-			-	-	-	-			-	-			19		73			
pH	SU	NV	6.92		7.11		7.11		6.19		6.19		-	-	5.57		5.57		6.28		6.28		6.47		6.61			
Temperature	C	NV	18.85		21.65		21.65		16.27		16.27		-	-	15.38		15.38		17.86		17.86		17.22		19.98			
Total Purge	L	NV																							0			
Turbidity	NTU	NV	194		161		161		284		284		-	-	50.2		50.2		26.2		26.2		184		67.6			
Water Level at Reading Time	Ft BTOC	NV																					25.99		24			
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV					< 2	U																				
Ethylene	µg/L	NV					< 2	U																				
Methane	µg/L	NV					20																					
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV					0.0539																					
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																					17					
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U			< 1	U			< 1	U					< 0.4	U			< 2	U	< 1	U	< 0.5	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																					< 1	U	< 0.5	U		
1,1,2-Trichloroethane	µg/L	5	1.44				1.72	J			2.14	J					2.67				1.62	J	< 1	U	1.2			
1,1-Dichloroethane	µg/L	10,000	23.7				23.5				26.2						38.5				27.6		22		15			
1,1-Dichloroethene	µg/L	7	544				631				694						728				714		250		450			
1,1-Dichloropropene	µg/L	3	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U			< 0.75	U			< 0.75	U					< 0.3	U			< 1.5	U	< 1	U	< 0.5	U		
1,2,3-Trichloropropane	µg/L	0.04	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 1	U	< 0.5	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U			< 1	U			< 1	U					< 0.4	U			< 2	U	< 1	U	< 0.5	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U			< 5	U			< 5	U					< 2	U			< 10	U	< 1	U	< 0.5	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,2-Dichlorobenzene	µg/L	600	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
1,2-Dichloroethane	µg/L	5	28.7				31.4				38.6						52.6				43.3		28		22			
1,2-Dichloropropane	µg/L	5	< 0.4	U			< 1	U			< 1	U					< 0.4	U			< 2	U	< 1	U	< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW01																							
		Sample ID	67WW01-021015		67WW01-150519		67WW01-051915		67WW01-151119		67WW01-111915		67WW01-151215		67WW01-160329		67WW01-032916		67WW01-160519		67WW01-051916		67WW01-112817		67WW01-180503		67WW01-181025	
		Sample Date	2/10/2015		5/19/2015		5/19/2015		11/19/2015		11/19/2015		12/15/2015		3/29/2016		3/29/2016		5/19/2016		5/19/2016		11/28/2017		5/3/2018		10/25/2018	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
1,3-Dichloropropane	µg/L	29	< 0.4	U			< 1	U			< 1	U					< 0.4	U			< 2	U	< 1	U	< 0.5	U		
1,4-Dichlorobenzene	µg/L	75	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
2-Butanone	µg/L	61,000	< 5	U			< 12.5	U			< 12.5	U					< 5	U			< 25	U	< 2	U	< 1	U		
2-Chlorotoluene	µg/L	2,000	< 0.25	U			< 0.626	UJ			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
2-Hexanone	µg/L	6,100	< 5	U			< 12.5	U			< 12.5	U					< 5	U			< 25	U	< 2	U	< 1	U		
4-Chlorotoluene	µg/L	2,000	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Acetone	µg/L	92,000	< 5	U			< 12.5	U			< 12.5	U					< 5	U			< 25	U	< 2	U	< 1	U		
Benzene	µg/L	5	< 0.25	U			< 0.626	U			< 0.626	U					0.168	J			< 1.25	U	< 1	U	< 0.5	U		
Bromobenzene	µg/L	2,000	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
Bromochloromethane	µg/L	4,100	< 0.4	U			< 1	U			< 1	U					< 0.4	U			< 2	U	< 1	U	< 0.5	U		
Bromodichloromethane	µg/L	5	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Bromoform	µg/L	36	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 1	U	< 0.5	U		
Bromomethane	µg/L	140	< 1	UJ			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 1	U	< 0.5	U		
Carbon disulfide	µg/L	10,000	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 2	U	< 1	U		
Carbon tetrachloride	µg/L	5	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Chlorobenzene	µg/L	100	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
Chloroethane	µg/L	41,000	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 1	U	< 0.5	U		
Chloroform	µg/L	1,000	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
Chloromethane	µg/L	220	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 1	U	< 0.5	U		
cis-1,2-Dichloroethene	µg/L	70	1.82				1.54	J			1.6	J					2.16				1.47	J	1.3		0.95	J		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Dibromochloromethane	µg/L	34	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Dibromomethane	µg/L	380	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	UJ			< 2.5	U	< 1	U	< 0.5	U		
Ethylbenzene	µg/L	700	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Hexachlorobutadiene	µg/L	20	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	UJ	< 1	U	< 0.5	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
m,p-Xylenes	µg/L	10,000	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 2	U	< 1	U		
Methyl isobutyl ketone	µg/L	8,200	< 5	U			< 12.5	U			< 12.5	U					< 5	U			< 25	U	< 2	U	< 1	U		
Methylene chloride	µg/L	5	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 2	U	< 1	U		
Naphthalene	µg/L	2,000	< 0.4	U			< 1	U			< 1	U					< 0.4	U			< 2	U	< 1	U	< 0.5	U		
n-Butylbenzene	µg/L	4,100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
n-Propylbenzene	µg/L	4,100	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
o-Xylene	µg/L	10,000	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Styrene	µg/L	100	< 0.25	U			< 0.626	U			< 0.626	U					< 0.25	U			< 1.25	U	< 1	U	< 0.5	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Tetrachloroethene	µg/L	5	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Toluene	µg/L	1,000	0.287	J			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29	< 1	U			< 2.5	U			< 2.5	U					< 1	U			< 5	U	< 1	U	< 0.5	U		
Trichloroethene	µg/L	5	4.07				3.03				2.84						4				3.28	J	2.1		1.7			
Trichlorofluoromethane	µg/L	31,000	< 0.5	U			< 1.25	U			< 1.25	U					< 0.5	U			< 2.5	U	< 1	U	< 0.5	U		
Vinyl chloride	µg/L	2	2.38				1.86	J			2.38	J					3.64				2.98	J	< 1	U	1.4			

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW01										67WW02													
		Sample ID	67WW01-190503		67WW01-191024		67WW01-201103		67WW01-211111		67WW01-221108		67WW02-130502		67WW02-050213		67WW02-130531		67WW02-053113		67WW02-130927		67WW02-092713		67WW02-140123		67WW02-012314	
		Sample Date	5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		5/2/2013		5/2/2013		5/31/2013		5/31/2013		9/27/2013		9/27/2013		1/23/2014		1/23/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																								
Nitrite	mg/L	1																								
Sulfate	mg/L	NV																								
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV																								
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	3.67		4.39		4.44		3.31		3.72		3.25		3.25		3.02		3.02		2.94		2.94		3.04		3.04	
Dissolved oxygen	mg/L	NV	0.46		0.43		0.1		0.55		1.06		3.4		3.4		8.68		8.68		10.06		10.06		5.81		5.81	
Ferrous Iron	NA	NV									1.5																	
Flow Rate	mL/Min	NV	100		100		100																					
Measured well depth	Ft BTOC	NV	27.03		26.94																							
Oxidation Reduction Potential	mV	NV	202		99		55		39		-30		92		92		-8		-8		73		73		-65		-65	
pH	SU	NV	6.17		5.99		6.23		6.46		6.55		5.72		5.72		6.57		6.57		6.69		6.69		6.78		6.78	
Temperature	C	NV	19.81		21.04		17.90		18.37		20.27		20.58		20.58		27.07		27.07		25.23		25.23		16.2		16.2	
Total Purge	L	NV	3		3.0		3																					
Turbidity	NTU	NV	100		57.3		168		97.7		134		78.4		78.4		51.4		51.4		21		21		49.7		49.7	
Water Level at Reading Time	Ft BTOC	NV	23.23		24.01		25.02																					
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																								
Ethylene	µg/L	NV																								
Methane	µg/L	NV																								
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26													1.7	J										
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U							< 1	UJ			< 0.4	U			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U																
1,1,2-Trichloroethane	µg/L	5	1.4		0.53	J	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000	12		3.4		2.6		1.6		1.3								0.507	J			0.508	J			0.406	J
1,1-Dichloroethene	µg/L	7	280		70		49		23		36								< 2	U			< 1	U			< 1	U
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	U	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U							< 1	U			< 0.3	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U							< 2	U			< 1	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U							< 1	U			< 0.4	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U							< 5	U			< 2	U			< 2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U							< 1	U			< 0.25	U			< 0.25	U
1,2-Dichloroethane	µg/L	5	21		7.6		6.1		3		3.6								< 1	U			< 0.5	U			< 0.5	U
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U							< 1	U			< 0.4	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW01										67WW02													
		Sample ID	67WW01-190503		67WW01-191024		67WW01-201103		67WW01-211111		67WW01-221108		67WW02-130502		67WW02-050213		67WW02-130531		67WW02-053113		67WW02-130927		67WW02-092713		67WW02-140123		67WW02-012314	
		Sample Date	5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		5/2/2013		5/2/2013		5/31/2013		5/31/2013		9/27/2013		9/27/2013		1/23/2014		1/23/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 1	U			< 0.5	U			< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.4	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 1	U			< 0.25	U			< 0.25	U
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 10	U			< 5	U			< 5	U
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.25	U			< 0.25	U
2-Hexanone	µg/L	6,100	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U							< 10	U			< 5	U			< 5	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 1	U			< 0.5	U			< 0.5	U
Acetone	µg/L	92,000	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U							< 10	U			< 5	U			< 5	U
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.25	U			< 0.25	U
Bromobenzene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 1	U			< 0.25	U			< 0.25	U
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.4	U			< 0.4	U
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
Bromoform	µg/L	36	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U							< 2	U			< 1	U			< 1	U
Bromomethane	µg/L	140	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U							< 2	UJ			< 1	U			< 1	U
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U							< 2	U			< 1	U			< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U							< 1	U			< 0.5	U			< 0.5	U
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.25	U			< 0.25	U
Chloroethane	µg/L	41,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 2	U			< 1	U			< 1	U
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.25	U			< 0.25	U
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 2	UJ			< 1	U			< 1	U
cis-1,2-Dichloroethene	µg/L	70	0.86	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Hexachlorobutadiene	µg/L	20	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U							< 1	U			< 0.5	U			< 0.5	U
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 2	U			< 1	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U							< 10	U			< 5	U			< 5	U
Methylene chloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U							< 1	U			< 0.5	U			< 0.5	U
Naphthalene	µg/L	2,000	< 0.5	U	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.4	U			< 0.4	U
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 1	U			< 0.5	U			< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.25	U			< 0.25	U
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Styrene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.25	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 2	U			< 1	U			< 1	U
Trichloroethene	µg/L	5	1.3		0.53	J	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U							< 1	U			< 0.5	U			< 0.5	U
Vinyl chloride	µg/L	2	0.92	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U			< 0.5	U			< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW02																							
		Sample ID	67WW02-140506		67WW02-050614		67WW02-140724		67WW02-072414		67WW02-141203		67WW02-120314		67WW02-150210		67WW02-021015		67WW02-150511		67WW02-051215		67WW02FD-051215		67WW02-151119		67WW02-111915	
		Sample Date	5/6/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		5/11/2015		5/12/2015		5/12/2015		11/19/2015		11/19/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	3		3		2.94		2.94		3.07		3.07		2.92		2.92		3.03						3.33		3.33	
Dissolved oxygen	mg/L	NV	6.54		6.54		8.83		8.83		-	-			-	-			-	-					-	-		
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	47		47		192		192		61		61		-30		-30		52						-	-		
pH	SU	NV	5.62		5.62		7.02		7.02		6.27		6.27		7.25		7.25		6.57						6.29		6.29	
Temperature	C	NV	21.01		21.01		22.38		22.38		19		19		19.49		19.49		19.34						17.57		17.57	
Total Purge	L	NV																										
Turbidity	NTU	NV	106		106		11.6		11.6		19.3		19.3		8.9		8.9		23						49.3		49.3	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000			0.44	J			0.335	J			0.406	J			0.592	J			0.883	J	0.873	J			0.302	J
1,1-Dichloroethene	µg/L	7			< 1	U			< 1	U			< 1	U			3.59				13.2		13				0.857	J
1,1-Dichloropropene	µg/L	3			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U	< 0.3	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2			< 2	U			< 2	U			< 2	U			< 2	U			< 2	U	< 2	U			< 2	U
1,2-Dibromoethane	µg/L	0.1			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
1,2-Dichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2-Dichloropropane	µg/L	5			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW02																							
		Sample ID	67WW02-140506		67WW02-050614		67WW02-140724		67WW02-072414		67WW02-141203		67WW02-120314		67WW02-150210		67WW02-021015		67WW02-150511		67WW02-051215		67WW02FD-051215		67WW02-151119		67WW02-111915	
		Sample Date	5/6/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		5/11/2015		5/12/2015		5/12/2015		11/19/2015		11/19/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
1,3-Dichloropropane	µg/L	29			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
2,2-Dichloropropane	µg/L	42			< 0.5	UJ			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
2-Butanone	µg/L	61,000			< 5	U			< 5	U			< 5	U			< 5	U			< 5	UJ	< 5	U			< 5	U
2-Chlorotoluene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
2-Hexanone	µg/L	6,100			< 5	U			< 5	U			< 5	U			< 5	U			< 5	UJ	< 5	UJ			< 5	U
4-Chlorotoluene	µg/L	2,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Acetone	µg/L	92,000			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 5	U			< 5	U
Benzene	µg/L	5			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
Bromobenzene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
Bromochloromethane	µg/L	4,100			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U
Bromodichloromethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Bromoform	µg/L	36			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
Bromomethane	µg/L	140			< 1	U			< 1	U			< 1	U			< 1	UJ			< 1	U	< 1	U			< 1	U
Carbon disulfide	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
Carbon tetrachloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Chlorobenzene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
Chloroethane	µg/L	41,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
Chloroform	µg/L	1,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
Chloromethane	µg/L	220			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
cis-1,2-Dichloroethene	µg/L	70			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Dibromochloromethane	µg/L	34			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Dibromomethane	µg/L	380			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Ethylbenzene	µg/L	700			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Hexachlorobutadiene	µg/L	20			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Isopropylbenzene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
m,p-Xylenes	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200			< 5	U			< 5	U			< 5	U			< 5	U			< 5	UJ	< 5	UJ			< 5	U
Methylene chloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Naphthalene	µg/L	2,000			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U
n-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
n-Propylbenzene	µg/L	4,100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
o-Xylene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
sec-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Styrene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Tetrachloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Toluene	µg/L	1,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U
Trichloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U
Vinyl chloride	µg/L	2			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW02																							
		Sample ID	67WW02-151215		67WW02-160519		67WW02FD-051916		67WW02-051916		67WW02-112817		67WW02-180503		67WW02-180503FD		67WW02-181025		67WW02-190501		67WW02-191024		67WW02-201102		67WW02-211110		67WW02-221107	
		Sample Date	12/15/2015		5/19/2016		5/19/2016		5/19/2016		11/28/2017		5/3/2018		5/3/2018		10/25/2018		5/1/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022	
		Sample Purpose	REG		REG		FD		REG		REG		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	3.43		3.8				3.8		4.26		3.87				4		4.03		4.12		4.42		4.65		4.54	
Dissolved oxygen	mg/L	NV	0.29		-	-					7.82		8.6				1.27		0.27		0.36		0.17		0.34		0.07	
Ferrous Iron	NA	NV																									0.94	
Flow Rate	mL/Min	NV											0				100		100		100		100					
Measured well depth	Ft BTOC	NV									27.78		27.88				27.92		27.8		27.75							
Oxidation Reduction Potential	mV	NV	119		-	-					90		155				129		73		125		51		108		89	
pH	SU	NV	6.42		6.08				6.08		6.12		6.37				6.50		5.74		6.26		6.68		5.89		6.29	
Temperature	C	NV	20.93		18.37				18.37		15.93		20.69				19.04		24.0		22.60		20.0		18.21		24.01	
Total Purge	L	NV											0				3		3.0		3		3.0					
Turbidity	NTU	NV	12.3		10.6				10.6		20.9		14.3				1.1		0		8.7		20.2		71		333	
Water Level at Reading Time	Ft BTOC	NV									23.97		24.15				24.6		22.67		23.22		22.19					
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26	2.75								0.26																	
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,1,1-Trichloroethane	µg/L	200					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1,2,2-Tetrachloroethane	µg/L	14					< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000									< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	1.2		< 0.5	U	1		0.6	J	< 0.3	U
1,1-Dichloroethane	µg/L	10,000					3.25		3.27		< 1	U	7.8		7.7		< 0.5	U	8.4		1.7		7.6		5.2		4.5	
1,1-Dichloroethene	µg/L	7					66.3		67.6		< 1	U	190		190		6.9		180		34		220		100		100	
1,1-Dichloropropene	µg/L	3					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,2,3-Trichlorobenzene	µg/L	310					< 0.3	U	< 0.3	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
1,2,3-Trichloropropane	µg/L	0.04					< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70					< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,2-Dibromo-3-chloropropane	µg/L	0.2					< 2	U	< 2	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U
1,2-Dibromoethane	µg/L	0.1					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,2-Dichlorobenzene	µg/L	600					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2-Dichloroethane	µg/L	5					0.321	J	0.377	J	< 1	U	2		1.9		< 0.5	U	4.7		< 0.5	U	5.5		3.2		< 0.2	U
1,2-Dichloropropane	µg/L	5					< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW02																							
		Sample ID	67WW02-151215		67WW02-160519		67WW02FD-051916		67WW02-051916		67WW02-112817		67WW02-180503		67WW02-180503FD		67WW02-181025		67WW02-190501		67WW02-191024		67WW02-201102		67WW02-211110		67WW02-221107	
		Sample Date	12/15/2015		5/19/2016		5/19/2016		5/19/2016		11/28/2017		5/3/2018		5/3/2018		10/25/2018		5/1/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022	
		Sample Purpose	REG		REG		FD		REG		REG		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,3-Dichlorobenzene	µg/L	3,100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
1,3-Dichloropropane	µg/L	29					< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,4-Dichlorobenzene	µg/L	75					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
2,2-Dichloropropane	µg/L	42					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
2-Butanone	µg/L	61,000					< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U
2-Chlorotoluene	µg/L	2,000					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
2-Hexanone	µg/L	6,100					< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U
4-Chlorotoluene	µg/L	2,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
Acetone	µg/L	92,000					< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U
Benzene	µg/L	5					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromobenzene	µg/L	2,000					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
Bromochloromethane	µg/L	4,100					< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromodichloromethane	µg/L	5					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromoform	µg/L	36					< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U
Bromomethane	µg/L	140					< 1	UJ	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U
Carbon disulfide	µg/L	10,000					< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U
Carbon tetrachloride	µg/L	5					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
Chlorobenzene	µg/L	100					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Chloroethane	µg/L	41,000					< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Chloroform	µg/L	1,000					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Chloromethane	µg/L	220					< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
cis-1,2-Dichloroethene	µg/L	70					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
cis-1,3-Dichloropropene	µg/L	5					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Dibromochloromethane	µg/L	34					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Dibromomethane	µg/L	380					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Dichlorodifluoromethane	µg/L	20,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Ethylbenzene	µg/L	700					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Hexachlorobutadiene	µg/L	20					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
m,p-Xylenes	µg/L	10,000					< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U
Methyl isobutyl ketone	µg/L	8,200					< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U
Methylene chloride	µg/L	5					< 0.5	U	< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.4	U
Naphthalene	µg/L	2,000					< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
n-Butylbenzene	µg/L	4,100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
n-Propylbenzene	µg/L	4,100					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
o-Xylene	µg/L	10,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
p-Isopropyltoluene	µg/L	10,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
sec-Butylbenzene	µg/L	4,100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Styrene	µg/L	100					< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
tert-Butylbenzene	µg/L	4,100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Tetrachloroethene	µg/L	5					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Toluene	µg/L	1,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
trans-1,2-Dichloroethene	µg/L	100					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
trans-1,3-Dichloropropene	µg/L	29					< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Trichloroethene	µg/L	5					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	0.87	J	< 0.5	U	0.83	J	< 0.5	U	< 0.2	U
Trichlorofluoromethane	µg/L	31,000					< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Vinyl chloride	µg/L	2					0.273	J	0.285	J	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW03																									
		Sample ID	67WW03-130927		67WW03-140123		67WW03-140506		67WW03-140723		67WW03-141202		67WW03-150210		67WW03-150511		67WW03-051215		67WW03-151118		67WW03-151215		67WW03-160329		67WW03-032916		67WW03-160519	
		Sample Date	9/27/2013		1/23/2014		5/6/2014		7/23/2014		12/2/2014		2/10/2015		5/11/2015		5/12/2015		11/18/2015		12/15/2015		3/29/2016		3/29/2016		5/19/2016	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV		-	-	-		-	-	-		-		-	4.56				-	-		-	5.5				5.22	
Dissolved oxygen	mg/L	NV	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-			-	-
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	-	-	-	-	-	-	-	-	-	-	-	-	40				-	-	-	-	-	-			-	-
pH	SU	NV	-	-	-	-	-	-	-	-	-	-	-	-	6.12				-	-	-	-	4.41	-			6.26	
Temperature	C	NV	-	-		-	-	-	-	-	-	-		-	18.52				-	-		-	13.21				17.89	
Total Purge	L	NV																										
Turbidity	NTU	NV	-	-	-	-	-	-	-	-	-	-	-	-	200				-	-	-	-	28.9				9.1	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110															< 0.5	U							< 0.5	U		
1,1,1-Trichloroethane	µg/L	200															< 0.5	U							< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14															< 0.4	U							< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5															< 0.5	U							< 0.5	U		
1,1-Dichloroethane	µg/L	10,000															< 0.25	U							< 0.25	U		
1,1-Dichloroethene	µg/L	7															< 1	U							< 1	U		
1,1-Dichloropropene	µg/L	3															< 0.5	U							< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310															< 0.3	U							< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04															< 1	U							< 1	U		
1,2,4-Trichlorobenzene	µg/L	70															< 0.4	U							< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100															< 0.5	U							< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2															< 2	U							< 2	U		
1,2-Dibromoethane	µg/L	0.1															< 0.5	U							< 0.5	U		
1,2-Dichlorobenzene	µg/L	600															< 0.25	U							< 0.25	U		
1,2-Dichloroethane	µg/L	5															< 0.5	U							< 0.5	U		
1,2-Dichloropropane	µg/L	5															< 0.4	U							< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW03																							
		Sample ID	67WW03-130927		67WW03-140123		67WW03-140506		67WW03-140723		67WW03-141202		67WW03-150210		67WW03-150511		67WW03-051215		67WW03-151118		67WW03-151215		67WW03-160329		67WW03-032916		67WW03-160519	
		Sample Date	9/27/2013		1/23/2014		5/6/2014		7/23/2014		12/2/2014		2/10/2015		5/11/2015		5/12/2015		11/18/2015		12/15/2015		3/29/2016		3/29/2016		5/19/2016	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100															< 0.5	U							< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100															< 0.5	U							< 0.5	U		
1,3-Dichloropropane	µg/L	29															< 0.4	U							< 0.4	U		
1,4-Dichlorobenzene	µg/L	75															< 0.25	U							< 0.25	U		
2,2-Dichloropropane	µg/L	42															< 0.5	U							< 0.5	U		
2-Butanone	µg/L	61,000															< 5	UJ							< 5	U		
2-Chlorotoluene	µg/L	2,000															< 0.25	U							< 0.25	U		
2-Hexanone	µg/L	6,100															< 5	U							< 5	U		
4-Chlorotoluene	µg/L	2,000															< 0.5	U							< 0.5	U		
Acetone	µg/L	92,000															< 5	U							< 5	U		
Benzene	µg/L	5															< 0.25	U							< 0.25	U		
Bromobenzene	µg/L	2,000															< 0.25	U							< 0.25	U		
Bromochloromethane	µg/L	4,100															< 0.4	U							< 0.4	U		
Bromodichloromethane	µg/L	5															< 0.5	U							< 0.5	U		
Bromoform	µg/L	36															< 1	U							< 1	U		
Bromomethane	µg/L	140															< 1	U							< 1	U		
Carbon disulfide	µg/L	10,000															< 1	U							< 1	U		
Carbon tetrachloride	µg/L	5															< 0.5	U							< 0.5	U		
Chlorobenzene	µg/L	100															< 0.25	U							< 0.25	U		
Chloroethane	µg/L	41,000															< 1	U							< 1	U		
Chloroform	µg/L	1,000															< 0.25	U							< 0.25	U		
Chloromethane	µg/L	220															< 1	U							< 1	U		
cis-1,2-Dichloroethene	µg/L	70															< 0.5	U							< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5															< 0.5	U							< 0.5	U		
Dibromochloromethane	µg/L	34															< 0.5	U							< 0.5	U		
Dibromomethane	µg/L	380															< 0.5	U							< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000															< 0.5	U							< 0.5	U		
Ethylbenzene	µg/L	700															< 0.5	U							< 0.5	U		
Hexachlorobutadiene	µg/L	20															< 0.5	U							< 0.5	U		
Isopropylbenzene	µg/L	10,000															< 0.5	U							< 0.5	U		
m,p-Xylenes	µg/L	10,000															< 1	U							< 1	U		
Methyl isobutyl ketone	µg/L	8,200															< 5	U							< 5	U		
Methylene chloride	µg/L	5															< 0.5	U							< 0.5	U		
Naphthalene	µg/L	2,000															< 0.4	U							< 0.4	U		
n-Butylbenzene	µg/L	4,100															< 0.5	U							< 0.5	U		
n-Propylbenzene	µg/L	4,100															< 0.25	U							< 0.25	U		
o-Xylene	µg/L	10,000															< 0.5	U							< 0.5	U		
p-Isopropyltoluene	µg/L	10,000															0.411	J							0.456	J		
sec-Butylbenzene	µg/L	4,100															< 0.5	U							< 0.5	U		
Styrene	µg/L	100															< 0.25	U							< 0.25	U		
tert-Butylbenzene	µg/L	4,100															< 0.5	U							< 0.5	U		
Tetrachloroethene	µg/L	5															< 0.5	U							< 0.5	U		
Toluene	µg/L	1,000															< 0.5	U							< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100															< 0.5	U							< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29															< 1	U							< 1	U		
Trichloroethene	µg/L	5															< 0.5	U							< 0.5	U		
Trichlorofluoromethane	µg/L	31,000															< 0.5	U							< 0.5	U		
Vinyl chloride	µg/L	2															< 0.5	U							< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW03										67WW04															
		Sample ID	67WW03-051916		67WW03-180502		67WW03-181025		67WW03-190502		67WW03-191028		67WW04-130927		67WW04-140123		67WW04-140506		67WW04-140725		67WW04-141202		67WW04-150210		67WW04-150511		67WW04-151118	
		Sample Date	5/19/2016		5/2/2018		10/25/2018		5/2/2019		10/28/2019		9/27/2013		1/23/2014		5/6/2014		7/25/2014		12/2/2014		2/10/2015		5/11/2015		11/18/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV											-	-		-		-	-	-	-	-		-		-	-	-
Dissolved oxygen	mg/L	NV											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV			24.9		24.95		24.9		24.87																	
Oxidation Reduction Potential	mV	NV											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH	SU	NV											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperature	C	NV											-	-	-	-		-		-	-	-		-		-		-
Total Purge	L	NV																										
Turbidity	NTU	NV											-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U																								
1,1,1-Trichloroethane	µg/L	200	< 0.5	U																								
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U																								
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5	< 0.5	U																								
1,1-Dichloroethane	µg/L	10,000	< 0.25	U																								
1,1-Dichloroethene	µg/L	7	< 1	U																								
1,1-Dichloropropene	µg/L	3	< 0.5	U																								
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U																								
1,2,3-Trichloropropane	µg/L	0.04	< 1	U																								
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U																								
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U																								
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U																								
1,2-Dibromoethane	µg/L	0.1	< 0.5	U																								
1,2-Dichlorobenzene	µg/L	600	< 0.25	U																								
1,2-Dichloroethane	µg/L	5	< 0.5	U																								
1,2-Dichloropropane	µg/L	5	< 0.4	U																								

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW03										67WW04													
		Sample ID	67WW03-051916		67WW03-180502		67WW03-181025		67WW03-190502		67WW03-191028		67WW04-130927		67WW04-140123		67WW04-140506		67WW04-140725		67WW04-141202		67WW04-150210		67WW04-150511		67WW04-151118	
		Sample Date	5/19/2016		5/2/2018		10/25/2018		5/2/2019		10/28/2019		9/27/2013		1/23/2014		5/6/2014		7/25/2014		12/2/2014		2/10/2015		5/11/2015		11/18/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U																								
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U																								
1,3-Dichloropropane	µg/L	29	< 0.4	U																								
1,4-Dichlorobenzene	µg/L	75	< 0.25	U																								
2,2-Dichloropropane	µg/L	42	< 0.5	U																								
2-Butanone	µg/L	61,000	< 5	U																								
2-Chlorotoluene	µg/L	2,000	< 0.25	U																								
2-Hexanone	µg/L	6,100	< 5	U																								
4-Chlorotoluene	µg/L	2,000	< 0.5	U																								
Acetone	µg/L	92,000	< 5	U																								
Benzene	µg/L	5	< 0.25	U																								
Bromobenzene	µg/L	2,000	< 0.25	U																								
Bromochloromethane	µg/L	4,100	< 0.4	U																								
Bromodichloromethane	µg/L	5	< 0.5	U																								
Bromoform	µg/L	36	< 1	U																								
Bromomethane	µg/L	140	< 1	U																								
Carbon disulfide	µg/L	10,000	< 1	U																								
Carbon tetrachloride	µg/L	5	< 0.5	U																								
Chlorobenzene	µg/L	100	< 0.25	U																								
Chloroethane	µg/L	41,000	< 1	U																								
Chloroform	µg/L	1,000	< 0.25	U																								
Chloromethane	µg/L	220	< 1	U																								
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U																								
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U																								
Dibromochloromethane	µg/L	34	< 0.5	U																								
Dibromomethane	µg/L	380	< 0.5	U																								
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U																								
Ethylbenzene	µg/L	700	< 0.5	U																								
Hexachlorobutadiene	µg/L	20	< 0.5	U																								
Isopropylbenzene	µg/L	10,000	< 0.5	U																								
m,p-Xylenes	µg/L	10,000	< 1	U																								
Methyl isobutyl ketone	µg/L	8,200	< 5	U																								
Methylene chloride	µg/L	5	< 0.5	U																								
Naphthalene	µg/L	2,000	< 0.4	U																								
n-Butylbenzene	µg/L	4,100	< 0.5	U																								
n-Propylbenzene	µg/L	4,100	< 0.25	U																								
o-Xylene	µg/L	10,000	< 0.5	U																								
p-Isopropyltoluene	µg/L	10,000	< 0.5	U																								
sec-Butylbenzene	µg/L	4,100	< 0.5	U																								
Styrene	µg/L	100	< 0.25	U																								
tert-Butylbenzene	µg/L	4,100	< 0.5	U																								
Tetrachloroethene	µg/L	5	< 0.5	U																								
Toluene	µg/L	1,000	< 0.5	U																								
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U																								
trans-1,3-Dichloropropene	µg/L	29	< 1	U																								
Trichloroethene	µg/L	5	< 0.5	U																								
Trichlorofluoromethane	µg/L	31,000	< 0.5	U																								
Vinyl chloride	µg/L	2	< 0.5	U																								

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW04		67WW05																					
		Sample ID	67WW04-160518		67WW05-130531		67WW05-053113		67WW05-130928		67WW05-092813		67WW05-140123		67WW05-012314		67WW05-140506		67WW05-050614		67WW05-140724		67WW05-072414		67WW05-141203		67WW05-120314	
		Sample Date	5/18/2016		5/31/2013		5/31/2013		9/28/2013		9/28/2013		1/23/2014		1/23/2014		5/6/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																	697									
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV		-	2.66				2.67				2.75				2.62				2.49				2.61			
Dissolved oxygen	mg/L	NV	-	-	8.72				10.02				6.01				7.35				8.31				-	-		
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	-	-	-15				-72				-34				13				221				34			
pH	SU	NV	-	-	6.94				6.37				6.57				5.56				6.92				5.7			
Temperature	C	NV	-	-	26.87				21.75				15.83				22.15				22.72				18.55			
Total Purge	L	NV																										
Turbidity	NTU	NV	-	-	2.5				16.2				9.7				8.1				28.5				24.8			
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14					< 1	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
1,1-Dichloroethene	µg/L	7					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
1,1-Dichloropropene	µg/L	3					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310					< 1	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70					< 1	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2					< 5	U			< 2	U			< 2	U			< 2	U			< 2	U			< 2	U
1,2-Dibromoethane	µg/L	0.1					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
1,2-Dichloroethane	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dichloropropane	µg/L	5					< 1	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW04		67WW05																					
		Sample ID	67WW04-160518		67WW05-130531		67WW05-053113		67WW05-130928		67WW05-092813		67WW05-140123		67WW05-012314		67WW05-140506		67WW05-050614		67WW05-140724		67WW05-072414		67WW05-141203		67WW05-120314	
		Sample Date	5/18/2016		5/31/2013		5/31/2013		9/28/2013		9/28/2013		1/23/2014		1/23/2014		5/6/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
1,3-Dichloropropane	µg/L	29					< 1	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
2,2-Dichloropropane	µg/L	42					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
2-Butanone	µg/L	61,000					< 10	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U
2-Chlorotoluene	µg/L	2,000					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
2-Hexanone	µg/L	6,100					< 10	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U
4-Chlorotoluene	µg/L	2,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Acetone	µg/L	92,000					< 10	UJ			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U
Benzene	µg/L	5					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
Bromobenzene	µg/L	2,000					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
Bromochloromethane	µg/L	4,100					< 1	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U
Bromodichloromethane	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Bromoform	µg/L	36					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
Bromomethane	µg/L	140					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
Carbon disulfide	µg/L	10,000					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
Carbon tetrachloride	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Chlorobenzene	µg/L	100					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
Chloroethane	µg/L	41,000					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
Chloroform	µg/L	1,000					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
Chloromethane	µg/L	220					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
cis-1,2-Dichloroethene	µg/L	70					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Dibromochloromethane	µg/L	34					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Dibromomethane	µg/L	380					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Ethylbenzene	µg/L	700					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Hexachlorobutadiene	µg/L	20					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Isopropylbenzene	µg/L	10,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
m,p-Xylenes	µg/L	10,000					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200					< 10	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U
Methylene chloride	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Naphthalene	µg/L	2,000					< 1	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U
n-Butylbenzene	µg/L	4,100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
n-Propylbenzene	µg/L	4,100					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
o-Xylene	µg/L	10,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
sec-Butylbenzene	µg/L	4,100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Styrene	µg/L	100					< 1	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Tetrachloroethene	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Toluene	µg/L	1,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29					< 2	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U
Trichloroethene	µg/L	5					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U
Vinyl chloride	µg/L	2					< 1	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW05																									
		Sample ID	67WW05-150210		67WW05-021015		67WW05-150511		67WW05-051215		67WW05-151119		67WW05-111915		67WW05-160519		67WW05-051916		67WW05-112817		67WW05-180503		67WW05-181025		67WW05-181025-FD		67WW05-190502	
		Sample Date	2/10/2015		2/10/2015		5/11/2015		5/12/2015		11/19/2015		11/19/2015		5/19/2016		5/19/2016		11/28/2017		5/3/2018		10/25/2018		10/25/2018		5/2/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	2.36				2.43				2.83				2.77				2.75		2.45		2.75				2.65	
Dissolved oxygen	mg/L	NV	-	-			-	-			-	-			-	-			7.47		9.51		0.11				1.99	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																			0		100				100	
Measured well depth	Ft BTOC	NV																	30.13		24.9		30.2				30.13	
Oxidation Reduction Potential	mV	NV	-10				127				-	-			-	-			133		229		172				247	
pH	SU	NV	6.83				5.74				5.12				5.42				5.26		5.68		5.17				4.11	
Temperature	C	NV	19.82				19.69				16.33				18.66				16.09		20.63		17.93				20.10	
Total Purge	L	NV																			0		3.0				3	
Turbidity	NTU	NV	22.7				100				129				91.8				301		54		21.3				55.2	
Water Level at Reading Time	Ft BTOC	NV																	25.6		25.08		26.07				24.68	
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																	0.53									
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloropropene	µg/L	3			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U
1,2,3-Trichloropropane	µg/L	0.04			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2			< 2	U			< 2	U			< 2	U			< 2	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2-Dibromoethane	µg/L	0.1			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW05																							
		Sample ID	67WW05-150210		67WW05-021015		67WW05-150511		67WW05-051215		67WW05-151119		67WW05-111915		67WW05-160519		67WW05-051916		67WW05-112817		67WW05-180503		67WW05-181025		67WW05-181025-FD		67WW05-190502	
		Sample Date	2/10/2015		2/10/2015		5/11/2015		5/12/2015		11/19/2015		11/19/2015		5/19/2016		5/19/2016		11/28/2017		5/3/2018		10/25/2018		10/25/2018		5/2/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100			< 5	U			< 5	UJ			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 2	U	< 2	U	< 1	U
Benzene	µg/L	5			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140			< 1	UJ			< 1	U			< 1	U			< 1	UJ	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Ethylbenzene	µg/L	700			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200			< 5	U			< 5	UJ			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Methylene chloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U
n-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW05										67WW06													
		Sample ID	67WW05-191024		67WW05-201102		67WW05-211110-FD		67WW05-211110		67WW05-221107		67WW06-130430		67WW06-043013		67WW06-130531		67WW06-053113		67WW06-053113-FD		67WW06-130928		67WW06-092813		67WW06-140124	
		Sample Date	10/24/2019		11/2/2020		11/10/2021		11/10/2021		11/7/2022		4/30/2013		4/30/2013		5/31/2013		5/31/2013		5/31/2013		9/28/2013		9/28/2013		1/24/2014	
		Sample Purpose	REG		REG		FD		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																								
Nitrite	mg/L	1																								
Sulfate	mg/L	NV																								
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV																								
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	2.58		3.03				3.11		2.64		6.38		6.38		6.37		6.37				6.45		6.45		7.09	
Dissolved oxygen	mg/L	NV	0.9		0.58				0.3		0.67		0		0		1.57		1.57				0.82		0.82		0.8	
Ferrous Iron	NA	NV									3.42																	
Flow Rate	mL/Min	NV	100		100																							
Measured well depth	Ft BTOC	NV	30.08																									
Oxidation Reduction Potential	mV	NV	62		31				48		-9		82		82		22		22				13		13		67	
pH	SU	NV	5.63		6.11				5.95		6.09		5.01		5.01		5.27		5.27				5.45		5.45		5.58	
Temperature	C	NV	18.35		17.69				17.77		20.58		24.95		24.95		24.28		24.28				20.2		20.2		15.42	
Total Purge	L	NV	3		3.0																							
Turbidity	NTU	NV	48.8		96.1				64.1		87.2		9.7		9.7		13.4		13.4				5.5		5.5		42.9	
Water Level at Reading Time	Ft BTOC	NV	24.98		23.74																							
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																								
Ethylene	µg/L	NV																								
Methane	µg/L	NV																								
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26													< 1	U										
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U							< 1	U	< 1	U			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U																
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
1,1-Dichloroethane	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							0.212	J	0.193	J			< 0.25	U		
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	0.62	J	< 0.5	U	< 0.2	U							< 2	U	< 2	U			< 1	U		
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U							< 1	U	< 1	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 2	U	< 2	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 1	U	< 1	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.2	U							< 5	U	< 5	U			< 2	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 1	U	< 1	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							2.25		2.2				1.77			
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U							< 1	U	< 1	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW05										67WW06													
		Sample ID	67WW05-191024		67WW05-201102		67WW05-211110-FD		67WW05-211110		67WW05-221107		67WW06-130430		67WW06-043013		67WW06-130531		67WW06-053113		67WW06-053113-FD		67WW06-130928		67WW06-092813		67WW06-140124	
		Sample Date	10/24/2019		11/2/2020		11/10/2021		11/10/2021		11/7/2022		4/30/2013		4/30/2013		5/31/2013		5/31/2013		5/31/2013		9/28/2013		9/28/2013		1/24/2014	
		Sample Purpose	REG		REG		FD		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U							< 1	U	< 1	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U							< 1	U	< 1	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 10	U	< 10	U			< 5	U		
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.25	U		
2-Hexanone	µg/L	6,100	< 1	U	< 2	U	< 2	U	< 2	U	< 1	U							< 10	U	< 10	U			< 5	U		
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U							< 1	U	< 1	U			< 0.5	U		
Acetone	µg/L	92,000	< 1	U	< 1	U	< 2	U	< 2	U	< 0.4	U							< 10	UJ	< 10	UJ			< 5	U		
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.25	U		
Bromobenzene	µg/L	2,000	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U							< 1	U	< 1	U			< 0.25	U		
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.4	U		
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
Bromoform	µg/L	36	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 2	U	< 2	U			< 1	U		
Bromomethane	µg/L	140	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U							< 2	U	< 2	U			< 1	UJ		
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U	< 2	U	< 2	U	< 0.6	U							< 2	U	< 2	U			< 1	U		
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U							< 1	U	< 1	U			< 0.5	U		
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.25	U		
Chloroethane	µg/L	41,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 2	U	< 2	U			< 1	U		
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.25	U		
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 2	U	< 2	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U							< 1	U	< 1	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U							< 2	U	< 2	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200	< 1	U	< 2	U	< 2	U	< 2	U	< 0.7	U							< 10	U	< 10	U			< 5	U		
Methylene chloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U							0.918	J	0.846	J			0.966	J		
Naphthalene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U							< 1	U	< 1	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.25	U		
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Styrene	µg/L	100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 2	U	< 2	U			< 1	U		
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U							< 1	U	< 1	U			< 0.5	U		
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U							< 1	U	< 1	U			< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW06																				67WW07			
		Sample ID	67WW06-012414		67WW06-140506		67WW06-140723		67WW06-141202		67WW06-150210		67WW06-150511		67WW06-151118		67WW06-151216		67WW06-161215		67WW06-160518		67WW06-112917		67WW07-130531		67WW07-053113	
		Sample Date	1/24/2014		5/6/2014		7/23/2014		12/2/2014		2/10/2015		5/11/2015		11/18/2015		12/16/2015		12/16/2015		5/18/2016		11/29/2017		5/31/2013		5/31/2013	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	7.09		-	-		-		-	-	-	-	-		-	6.13		6.13		-	-	5.36		3.99			
Dissolved oxygen	mg/L	NV	0.8		-	-	-	-	-	-	-	-	-	-	-	-	0		0		-	-	0.1		8.75			
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																					100					
Measured well depth	Ft BTOC	NV																					47.17					
Oxidation Reduction Potential	mV	NV	67		-	-	-	-	-	-	-	-	-	-	-	-	56		56		-	-	204		35			
pH	SU	NV	5.58		-	-	-	-	-	-	-	-	-	-	-	-	5.74		5.74		-	-	5.11		5.52			
Temperature	C	NV	15.42		-	-		-		-	-	-	-	-		-	19.27		19.27			-	18.57		25.72			
Total Purge	L	NV																					0.91					
Turbidity	NTU	NV	42.9		-	-	-	-	-	-	-	-	-	-	-	-	36.2		36.2		-	-	150		13.9			
Water Level at Reading Time	Ft BTOC	NV																					24.87					
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																	< 1	U			1.7					
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U																			< 1	U			< 1	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U																			< 1	U			< 1	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U																			< 1	U			< 1	UJ
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																					< 1	U				
1,1,2-Trichloroethane	µg/L	5	< 0.5	U																			< 1	U			< 1	U
1,1-Dichloroethane	µg/L	10,000	0.234	J																			< 1	U			< 1	U
1,1-Dichloroethene	µg/L	7	0.752	J																			< 1	U			< 2	U
1,1-Dichloropropene	µg/L	3	< 0.5	U																			< 1	U			< 1	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U																			< 1	U			< 1	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U																			< 1	U			< 2	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U																			< 1	U			< 1	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U																			< 1	U			< 1	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U																			< 1	U			< 5	UJ
1,2-Dibromoethane	µg/L	0.1	< 0.5	U																			< 1	U			< 1	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U																			< 1	U			< 1	U
1,2-Dichloroethane	µg/L	5	2.03																				1				1.67	
1,2-Dichloropropane	µg/L	5	< 0.4	U																			< 1	U			< 1	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW06																				67WW07			
		Sample ID	67WW06-012414		67WW06-140506		67WW06-140723		67WW06-141202		67WW06-150210		67WW06-150511		67WW06-151118		67WW06-151216		67WW06-161215		67WW06-160518		67WW06-112917		67WW07-130531		67WW07-053113	
		Sample Date	1/24/2014		5/6/2014		7/23/2014		12/2/2014		2/10/2015		5/11/2015		11/18/2015		12/16/2015		12/16/2015		5/18/2016		11/29/2017		5/31/2013		5/31/2013	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U																			< 1	U			< 1	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U																			< 1	U			< 1	U
1,3-Dichloropropane	µg/L	29	< 0.4	U																			< 1	U			< 1	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U																			< 1	U			< 1	U
2,2-Dichloropropane	µg/L	42	< 0.5	U																			< 1	U			< 1	U
2-Butanone	µg/L	61,000	< 5	U																			< 2	U			< 10	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U																			< 1	U			< 1	U
2-Hexanone	µg/L	6,100	< 5	U																			< 2	U			< 10	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U																			< 1	U			< 1	U
Acetone	µg/L	92,000	< 5	U																			< 2	U			< 10	U
Benzene	µg/L	5	< 0.25	U																			< 1	U			< 1	U
Bromobenzene	µg/L	2,000	< 0.25	U																			< 1	U			< 1	U
Bromochloromethane	µg/L	4,100	< 0.4	U																			< 1	U			< 1	U
Bromodichloromethane	µg/L	5	< 0.5	U																			< 1	U			< 1	U
Bromoform	µg/L	36	< 1	U																			< 1	U			< 2	U
Bromomethane	µg/L	140	< 1	U																			< 1	U			< 2	UJ
Carbon disulfide	µg/L	10,000	< 1	U																			< 2	U			< 2	U
Carbon tetrachloride	µg/L	5	< 0.5	U																			< 1	U			< 1	U
Chlorobenzene	µg/L	100	< 0.25	U																			< 1	U			< 1	U
Chloroethane	µg/L	41,000	< 1	U																			< 1	U			< 2	U
Chloroform	µg/L	1,000	< 0.25	U																			< 1	U			< 1	U
Chloromethane	µg/L	220	< 1	U																			< 1	U			< 2	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U																			< 1	U			< 1	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U																			< 1	U			< 1	U
Dibromochloromethane	µg/L	34	< 0.5	U																			< 1	U			< 1	U
Dibromomethane	µg/L	380	< 0.5	U																			< 1	U			< 1	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U																			< 1	U			< 1	UJ
Ethylbenzene	µg/L	700	< 0.5	U																			< 1	U			< 1	U
Hexachlorobutadiene	µg/L	20	< 0.5	U																			< 1	U			< 1	U
Isopropylbenzene	µg/L	10,000	< 0.5	U																			< 1	U			< 1	U
m,p-Xylenes	µg/L	10,000	< 1	U																			< 2	U			< 2	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U																			< 2	U			< 10	U
Methylene chloride	µg/L	5	< 0.5	U																			< 2	U			< 1	U
Naphthalene	µg/L	2,000	< 0.4	U																			< 1	U			< 1	U
n-Butylbenzene	µg/L	4,100	< 0.5	U																			< 1	U			< 1	U
n-Propylbenzene	µg/L	4,100	< 0.25	U																			< 1	U			< 1	U
o-Xylene	µg/L	10,000	< 0.5	U																			< 1	U			< 1	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U																			< 1	U			< 1	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U																			< 1	U			< 1	U
Styrene	µg/L	100	< 0.25	U																			< 1	U			< 1	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U																			< 1	U			< 1	U
Tetrachloroethene	µg/L	5	< 0.5	U																			< 1	U			< 1	U
Toluene	µg/L	1,000	< 0.5	U																			< 1	U			< 1	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U																			< 1	U			< 1	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U																			< 1	U			< 2	U
Trichloroethene	µg/L	5	< 0.5	U																			< 1	U			< 1	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U																			< 1	U			< 1	U
Vinyl chloride	µg/L	2	< 0.5	U																			< 1	U			< 1	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW07																							
		Sample ID	67WW07-130927		67WW07-092713		67WW07-140123		67WW07-012314		67WW07-140506		67WW07-050614		67WW07-140725		67WW07-072514		67WW07-141203		67WW07-120314		67WW07-150210		67WW07-021015		67WW07-150511	
		Sample Date	9/27/2013		9/27/2013		1/23/2014		1/23/2014		5/6/2014		5/6/2014		7/25/2014		7/25/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		5/11/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	4.13				4.14				3.71				3.99				4.06				3.76				3.61	
Dissolved oxygen	mg/L	NV	10.55				5.96				6.12				9.24				-	-			-	-			-	-
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	0				60				36				91				51				-18				31	
pH	SU	NV	5.78				5.79				5.45				5.58				5.79				6.41				5.98	
Temperature	C	NV	25.11				14.63				26.29				21.89				17.46				18.47				18.5	
Total Purge	L	NV																										
Turbidity	NTU	NV	9.6				54.4				30.2				8.8				10.7				6.7				35.3	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1-Dichloroethane	µg/L	10,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
1,1-Dichloroethene	µg/L	7			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
1,1-Dichloropropene	µg/L	3			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2			< 2	U			< 2	U			< 2	U			< 2	U			< 2	U			< 2	U		
1,2-Dibromoethane	µg/L	0.1			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5			1.77				1.35				1.44				1.39				1.19				1.04			
1,2-Dichloropropane	µg/L	5			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW07																							
		Sample ID	67WW07-130927		67WW07-092713		67WW07-140123		67WW07-012314		67WW07-140506		67WW07-050614		67WW07-140725		67WW07-072514		67WW07-141203		67WW07-120314		67WW07-150210		67WW07-021015		67WW07-150511	
		Sample Date	9/27/2013		9/27/2013		1/23/2014		1/23/2014		5/6/2014		5/6/2014		7/25/2014		7/25/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		5/11/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42			< 0.5	U			< 0.5	U			< 0.5	UJ			< 0.5	U			< 0.5	U			< 0.5	U		
2-Butanone	µg/L	61,000			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U		
2-Chlorotoluene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
2-Hexanone	µg/L	6,100			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U		
4-Chlorotoluene	µg/L	2,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Acetone	µg/L	92,000			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U		
Benzene	µg/L	5			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Bromobenzene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Bromochloromethane	µg/L	4,100			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
Bromodichloromethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Bromoform	µg/L	36			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Bromomethane	µg/L	140			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	UJ		
Carbon disulfide	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Carbon tetrachloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloroethane	µg/L	41,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Chloroform	µg/L	1,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloromethane	µg/L	220			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	34			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	380			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	700			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U		
Methylene chloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Naphthalene	µg/L	2,000			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
o-Xylene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Styrene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Toluene	µg/L	1,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Trichloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Vinyl chloride	µg/L	2			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW07																									
		Sample ID	67WW07-051215		67WW07-151119		67WW07-111915		67WW07-160519		67WW07-051916		67WW07-112917		67WW07-180503		67WW07-181025		67WW07-190503		67WW07-191028		67WW07-201102		67WW07-211110		67WW07-221108	
		Sample Date	5/12/2015		11/19/2015		11/19/2015		5/19/2016		5/19/2016		11/29/2017		5/3/2018		10/25/2018		5/3/2019		10/28/2019		11/2/2020		11/10/2021		11/8/2022	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV			4.08				3.96				3.80		3.56		3.80		3.7		2.06		1.72		1.23			
Dissolved oxygen	mg/L	NV			-	-			-	-			8.55		8.73		0.1		0.07		0.08		0.05		0.85		0.2	
Ferrous Iron	NA	NV																									2.89	
Flow Rate	mL/Min	NV													0		100		100		100		100					
Measured well depth	Ft BTOC	NV											27.9		27.85		28		27.88		27.85							
Oxidation Reduction Potential	mV	NV			-	-			-	-			264		88		200		249		61		38		154		14	
pH	SU	NV			6.22				6.04				4.72		6.68		5.01		5.05		6.34		6.37		5.43		6.41	
Temperature	C	NV			15.55				17.91				17.74		19.86		17.79		20.26		18.36		19.95		19.19		20.05	
Total Purge	L	NV													0		3.0		3.0		3.0		3					
Turbidity	NTU	NV			40.8				10.5				3.2		13.3		65.6		31.4		42.9		0		14.1		141	
Water Level at Reading Time	Ft BTOC	NV											24.7		24.25		25.19		21.95		23.63		22.3					
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26											0.53															
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000											< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,1-Dichloroethane	µg/L	10,000	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1-Dichloroethene	µg/L	7	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1-Dichloropropene	µg/L	3	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U			< 0.3	U			< 0.3	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U			< 2	U			< 2	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	0.817	J			0.601	J			0.33	J	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,2-Dichloropropane	µg/L	5	< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

Location Code			67WW07																							
Sample ID			67WW07-051215		67WW07-151119		67WW07-111915		67WW07-160519		67WW07-051916		67WW07-112917		67WW07-180503		67WW07-181025		67WW07-190503		67WW07-191028		67WW07-201102		67WW07-211110		67WW07-221108	
Sample Date			5/12/2015		11/19/2015		11/19/2015		5/19/2016		5/19/2016		11/29/2017		5/3/2018		10/25/2018		5/3/2019		10/28/2019		11/2/2020		11/10/2021		11/8/2022	
Sample Purpose			REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
1,3-Dichloropropane	µg/L	29	< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
2,2-Dichloropropane	µg/L	42	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
2-Butanone	µg/L	61,000	< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
2-Hexanone	µg/L	6,100	3.18	Q			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
Acetone	µg/L	92,000	< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U
Benzene	µg/L	5	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromobenzene	µg/L	2,000	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
Bromochloromethane	µg/L	4,100	< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromodichloromethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromoform	µg/L	36	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U
Bromomethane	µg/L	140	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U
Carbon disulfide	µg/L	10,000	< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U
Carbon tetrachloride	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Chloroethane	µg/L	41,000	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Chloroform	µg/L	1,000	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Chloromethane	µg/L	220	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Dibromochloromethane	µg/L	34	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Dibromomethane	µg/L	380	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Ethylbenzene	µg/L	700	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Hexachlorobutadiene	µg/L	20	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
m,p-Xylenes	µg/L	10,000	< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U
Methylene chloride	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U
Naphthalene	µg/L	2,000	< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U
n-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
n-Propylbenzene	µg/L	4,100	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
o-Xylene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Styrene	µg/L	100	< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Tetrachloroethene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Toluene	µg/L	1,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Trichloroethene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Vinyl chloride	µg/L	2	< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW08																							
		Sample ID	67WW08-130603		67WW08-060313		67WW08-131002		67WW08-100213		67WW08-012314		67WW08-140123		67WW08-050714		67WW08-140507		67WW08-072414		67WW08-140724		67WW08-141204		67WW08-120414		67WW08-150211	
		Sample Date	6/3/2013		6/3/2013		10/2/2013		10/2/2013		1/23/2014		1/23/2014		5/7/2014		5/7/2014		7/24/2014		7/24/2014		12/4/2014		12/4/2014		2/11/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV			1,320				1,360		1,490				1,380				1,340						1,410	H1		
Nitrate	mg/L	10			< 20	U			< 2	U	< 2	U			< 2	U			< 1	U					< 2	U		
Nitrite	mg/L	1			< 20	U			< 2	U	< 2	U			< 2	U			< 1	U					2.04	J		
Sulfate	mg/L	NV			300				297		303				365				317						302	J		
Sulfide	mg/L	NV							< 1	U	< 1	U			< 1	U												
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV			10.3				28.9						80.6				70.9						22.9			
Total Organic Carbon	mg/L	NV			3.61				6.32		9.95				10.6				7.58						3.68			
DHC																												
BVC	cells/mL	NV							0.5	U	0.5	U			0.5	U												
Dehalococcoides	cells/mL	NV			1	U			0.5	U	0.5	U			0.6													
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	4.85		4.85		5.11		5.11		5.08		5.08		5.43		5.43		4.98		4.98		5.07		5.07		4.38	
Dissolved oxygen	mg/L	NV	0		0		0.74		0.74		0.38		0.38		0.45		0.45		0		0		0		0		0	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	74		74		-165		-165		-90		-90		-32		-32		-7		-7		-1		-1		45	
pH	SU	NV	6.62		6.62		6.47		6.47		6.8		6.8		5.55		5.55		6.89		6.89		6.42		6.42		6.61	
Temperature	C	NV	29.25		29.25		21.82		21.82		17.22		17.22		19.33		19.33		21.72		21.72		19.14		19.14		18.75	
Total Purge	L	NV																										
Turbidity	NTU	NV	7.6		7.6		1.5		1.5		0.6		0.6		9.7		9.7		6.1		6.1		2.7		2.7		3.7	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																							89,600			
Ethane	µg/L	NV			< 5	U			< 2	U	< 2	U			< 2	U			< 2	U					< 2	U		
Ethylene	µg/L	NV			1.29	J			< 2	U	< 2	U			< 2	U			< 2	U					< 2	U		
Methane	µg/L	NV			10.6				< 2		7.79				6.97				6.47						14.4			
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV			0.0795				0.161		0.344				0.282				0.227						0.374			
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,1,1-Trichloroethane	µg/L	200			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,1,2,2-Tetrachloroethane	µg/L	14			< 1	U			< 4	U	< 2	U			< 4	U			< 4	U					< 4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5			4.25				5.08	J	6.7				5.01	J			7.74	J					7.36	J		
1,1-Dichloroethane	µg/L	10,000			37.5	R			46.5		54.4				57.3				56.7						63.9			
1,1-Dichloroethene	µg/L	7			940				1,120		1,340				1,590				1,890						2,320			
1,1-Dichloropropene	µg/L	3			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,2,3-Trichlorobenzene	µg/L	310			< 1	U			< 3	U	< 1.5	U			< 3	U			< 3	U					< 3	U		
1,2,3-Trichloropropane	µg/L	0.04			< 2	U			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
1,2,4-Trichlorobenzene	µg/L	70			5	R			< 4	U	< 2	U			< 4	U			< 4	U					< 4	U		
1,2,4-Trimethylbenzene	µg/L	5,100			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2			25	R			< 20	U	< 10	U			< 20	U			< 20	U					< 20	U		
1,2-Dibromoethane	µg/L	0.1			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,2-Dichlorobenzene	µg/L	600			3.13	R			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
1,2-Dichloroethane	µg/L	5			64.3	R			76.5		89.9				101				98.9						106			
1,2-Dichloropropane	µg/L	5			< 1	U			< 4	U	< 2	U			< 4	U			< 4	U					< 4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW08																							
		Sample ID	67WW08-130603		67WW08-060313		67WW08-131002		67WW08-100213		67WW08-012314		67WW08-140123		67WW08-050714		67WW08-140507		67WW08-072414		67WW08-140724		67WW08-141204		67WW08-120414		67WW08-150211	
		Sample Date	6/3/2013		6/3/2013		10/2/2013		10/2/2013		1/23/2014		1/23/2014		5/7/2014		5/7/2014		7/24/2014		7/24/2014		12/4/2014		12/4/2014		2/11/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,3-Dichlorobenzene	µg/L	3,100			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
1,3-Dichloropropane	µg/L	29			< 1	U			< 4	U	< 2	U			< 4	U			< 4	U					< 4	U		
1,4-Dichlorobenzene	µg/L	75			< 1	U			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
2,2-Dichloropropane	µg/L	42			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
2-Butanone	µg/L	61,000			< 10	U			< 50	U	< 25	U			< 50	U			< 50	U					< 50	U		
2-Chlorotoluene	µg/L	2,000			< 1	U			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
2-Hexanone	µg/L	6,100			62.5	R			< 50	U	< 25	U			< 50	U			< 50	U					< 50	U		
4-Chlorotoluene	µg/L	2,000			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Acetone	µg/L	92,000			< 10	U			< 50	U	< 25	U			< 50	U			< 50	U					< 50	U		
Benzene	µg/L	5			0.194	J			< 2.5	U	< 1.25	U			< 2.5	B			< 2.5	U					< 2.5	U		
Bromobenzene	µg/L	2,000			3.13	R			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
Bromochloromethane	µg/L	4,100			5	R			< 4	U	< 2	U			< 4	U			< 4	U					< 4	U		
Bromodichloromethane	µg/L	5			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Bromoform	µg/L	36			12.5	R			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
Bromomethane	µg/L	140			12.5	R			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
Carbon disulfide	µg/L	10,000			12.5	R			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
Carbon tetrachloride	µg/L	5			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Chlorobenzene	µg/L	100			< 1	U			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
Chloroethane	µg/L	41,000			< 2	U			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
Chloroform	µg/L	1,000			3.56				< 2.5	UJ	4.11	J			4.88	J			5.13	J					2.53	J		
Chloromethane	µg/L	220			12.5	R			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
cis-1,2-Dichloroethene	µg/L	70			2.18				< 5	U	2.73	J			< 5	U			< 5	U					2.69	J		
cis-1,3-Dichloropropene	µg/L	5			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Dibromochloromethane	µg/L	34			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Dibromomethane	µg/L	380			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Dichlorodifluoromethane	µg/L	20,000			< 1	UJ			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Ethylbenzene	µg/L	700			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Hexachlorobutadiene	µg/L	20			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Isopropylbenzene	µg/L	10,000			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
m,p-Xylenes	µg/L	10,000			12.5	R			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
Methyl isobutyl ketone	µg/L	8,200			62.5	R			< 50	U	< 25	U			< 50	U			< 50	U					< 50	U		
Methylene chloride	µg/L	5			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					3.42	J		
Naphthalene	µg/L	2,000			5	R			< 4	U	< 2	U			< 4	U			< 4	U					< 4	U		
n-Butylbenzene	µg/L	4,100			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
n-Propylbenzene	µg/L	4,100			< 1	U			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
o-Xylene	µg/L	10,000			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
p-Isopropyltoluene	µg/L	10,000			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
sec-Butylbenzene	µg/L	4,100			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Styrene	µg/L	100			< 1	U			< 2.5	U	< 1.25	U			< 2.5	U			< 2.5	U					< 2.5	U		
tert-Butylbenzene	µg/L	4,100			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Tetrachloroethene	µg/L	5			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Toluene	µg/L	1,000			< 1	U			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
trans-1,2-Dichloroethene	µg/L	100			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
trans-1,3-Dichloropropene	µg/L	29			12.5	R			< 10	U	< 5	U			< 10	U			< 10	U					< 10	U		
Trichloroethene	µg/L	5			2.86				< 5	U	3.12	J			4.41	J			3.14	J					3.55	J		
Trichlorofluoromethane	µg/L	31,000			6.25	R			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		
Vinyl chloride	µg/L	2			0.951	J			< 5	U	< 2.5	U			< 5	U			< 5	U					< 5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW08																							
		Sample ID	67WW08-021115		67WW08-150519		67WW08-051915		67WW08-151119		67WW08-111915		67WW08-160519		67WW08-051916		67WW08-112817-FD		67WW08-112817		67WW08-180501		67WW08-181023		67WW08-181023-FD		67WW08-190501	
		Sample Date	2/11/2015		5/19/2015		5/19/2015		11/19/2015		11/19/2015		5/19/2016		5/19/2016		11/28/2017		11/28/2017		5/1/2018		10/23/2018		10/23/2018		5/1/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV	1,250				1,750				1,400				1,510		1,590		1,600		1,530		1,820		1,770		1,680	
Nitrate	mg/L	10	< 4	U			< 2	U			< 2	U			< 2	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.2	U	< 0.2	U	< 0.5	U
Nitrite	mg/L	1	< 4	U			3.95	J			< 2	U			< 2	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.2	U	< 0.2	U		
Sulfate	mg/L	NV	258				524				300				365		440		4290		407		499		489		479	
Sulfide	mg/L	NV	< 1	U			< 1	U			< 1	U			< 1	U	1.48	J	1.48	J	< 1.5	U	< 1	U	< 1	U		
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV	160				55.2				103				44.2		140		130		150		55		58			
Total Organic Carbon	mg/L	NV	22.4				8.32				47.5				65.4		4		3.99		4.14		2.86		3.19		2.09	
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV															<	U	<	U	0.2		9.3					
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	4.38		5.85		5.85		5.06		5.06		5.42		5.42				5.83		5.49		6.29				6.28	
Dissolved oxygen	mg/L	NV	0		0.66		0.66		0.44		0.44		0.82		0.82				0.26		0		0.08				0.08	
Ferrous Iron	NA	NV																			0.11						0.21	
Flow Rate	mL/Min	NV																	100		100		100				100	
Measured well depth	Ft BTOC	NV																	52		50.9		52.45				51.95	
Oxidation Reduction Potential	mV	NV	45		-16		-16		113		113		129		129				186		260		150				138	
pH	SU	NV	6.61		6.53		6.53		6.13		6.13		5.79		5.79				5.88		6.18		6.33				5.82	
Temperature	C	NV	18.75		20.12		20.12		19.15		19.15		18.74		18.74				19.04		22.80		18.14				20.44	
Total Purge	L	NV																	0.78		3.5		3.5				3	
Turbidity	NTU	NV	3.7		67.1		67.1		45.3		45.3		9.3		9.3				21.3		5.1		0				0	
Water Level at Reading Time	Ft BTOC	NV																	24.17		23.11		24.62				21.9	
GASES																												
Carbon dioxide	µg/L	NV															240,000		290,000		420,000		130,000		130,000		270,000	
Ethane	µg/L	NV	< 2	U			< 2	U			< 2	U			< 2	U	< 0.23	U	< 0.23	U	< 0.47	U	< 0.94	U	< 0.94	U	< 0.47	U
Ethylene	µg/L	NV	< 2	U			< 2	U			< 2	U			< 2	U	< 0.22	U	< 0.22	U	< 0.55	UJ	< 1.1	U	< 1.1	U	< 0.55	U
Methane	µg/L	NV	9.4				5.16				12.1				11.3		1.6	J	2	J	2.1		5.4		5.5		2.5	
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																					220		221			
Ferrous Iron	mg/L	NV	0.0907				0.944				0.0931				0.0585						0.063	J	0.343		0.27			
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26															29	J	22	J								
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 4	U			< 4	U			< 4	U			< 4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000															< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	6.96	J			4.5	J			4.67	J			2.76	J	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000	61.1				52.1				48.1				31.9		18		15		14		12		12		7.5	
1,1-Dichloroethene	µg/L	7	1,930				1,570				1,710				1,130		350		340		300		160		160		110	
1,1-Dichloropropene	µg/L	3	< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 3	U			< 3	U			< 3	U			< 3	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichloropropane	µg/L	0.04	< 10	U			< 10	U			< 10	U			< 10	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 4	U			< 4	U			< 4	U			< 4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 20	U			< 20	U			< 20	U			< 20	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2-Dibromoethane	µg/L	0.1	< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	104				85.6				77.6				56.1		13		13		11		6.5		6.2		5.1	
1,2-Dichloropropane	µg/L	5	< 4	U			< 4	U			< 4	U			< 4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

			Location Code	67WW08																							
			Sample ID	67WW08-021115		67WW08-150519		67WW08-051915		67WW08-151119		67WW08-111915		67WW08-160519		67WW08-051916		67WW08-112817-FD		67WW08-112817		67WW08-180501		67WW08-181023		67WW08-181023-FD		67WW08-190501	
			Sample Date	2/11/2015		5/19/2015		5/19/2015		11/19/2015		11/19/2015		5/19/2016		5/19/2016		11/28/2017		11/28/2017		5/1/2018		10/23/2018		10/23/2018		5/1/2019	
			Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		FD		REG	
Parameter	Units	MCL/GW-Ind		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29		< 4	U			< 4	U			< 4	U			< 4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000		< 50	U			< 50	U			< 50	U			< 50	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100		< 50	U			< 50	U			< 50	U			< 50	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000		< 50	U			< 50	U			< 50	U			< 50	U	< 2	U	< 2	U	< 1	U	< 2	U	< 2	U	< 1	U
Benzene	µg/L	5		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100		< 4	U			< 4	U			< 4	U			< 4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36		< 10	U			< 10	U			< 10	U			< 10	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140		< 10	U			< 10	U			< 10	U			< 10	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000		< 10	U			< 10	U			< 10	U			< 10	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000		< 10	U			< 10	U			< 10	U			< 10	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000		2.57	J			3.04	J			1.61	J			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220		< 10	U			< 10	U			< 10	U			< 10	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70		2.71	J			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	UJ	< 0.5	U
Ethylbenzene	µg/L	700		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20		< 5	U			< 5	U			< 5	U			< 5	UJ	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000		< 10	U			< 10	U			< 10	U			< 10	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200		< 50	U			< 50	U			< 50	U			< 50	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Methylene chloride	µg/L	5		< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000		< 4	U			< 4	U			< 4	U			< 4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Butylbenzene	µg/L	4,100		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100		< 2.5	U			< 2.5	U			< 2.5	U			< 2.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29		< 10	U			< 10	U			< 10	U			< 10	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5		3.15	J			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2		< 5	U			< 5	U			< 5	U			< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

	Location Code	67WW08														67WW09											
	Sample ID	67WW08-191028-FD		67WW08-191028		67WW08-201103-FD		67WW08-201103		67WW08-211111		67WW08-221109		67WW08-221109-FD		67WW09-130601		67WW10-060113		67WW09-060113		67WW09-130928		67WW09-092813		67WW09-140124	
	Sample Date	10/28/2019		10/28/2019		11/3/2020		11/3/2020		11/11/2021		11/9/2022		11/9/2022		6/1/2013		6/1/2013		6/3/2013		9/28/2013		9/28/2013		1/24/2014	
	Sample Purpose	FD		REG		FD		REG		REG		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV	1,890		1,920		1,810		1,830		1,660		2190		2120													
Nitrate	mg/L	10	< 0.2	U	< 0.2	U	< 0.2	U	< 0.2	U	0.318	J	0.0458	J	0.0492	J												
Nitrite	mg/L	1																										
Sulfate	mg/L	NV	513		515		500		521		471		649		629													
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV	1.23		1.38	J	1.21		1.17		4.71		4.16		4.42													
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV			6.57				6.74		6.41						3.31		3.31				3.47		3.47		3.39	
Dissolved oxygen	mg/L	NV			0.11				0.32		0.83		0.05				0.52		0.52				0.83		0.83		0.86	
Ferrous Iron	NA	NV			0.41				1.06		0.28		0.66															
Flow Rate	mL/Min	NV			100				100																			
Measured well depth	Ft BTOC	NV			50.9																							
Oxidation Reduction Potential	mV	NV			126				62		174		76				189		189				157		157		136	
pH	SU	NV			6.05				5.94		5.73		6.02				6.64		6.64				6.31		6.31		6.24	
Temperature	C	NV			18.88				18.65		18.27		19.64				27.95		27.95				22.22		22.22		16.27	
Total Purge	L	NV			3.0				3.0																			
Turbidity	NTU	NV			0				0.8		13.8		0				4.5		4.5				1.7		1.7		0.9	
Water Level at Reading Time	Ft BTOC	NV			23.04				22.02																			
GASES																												
Carbon dioxide	µg/L	NV	110,000		130,000		270,000		270,000				81000		90000													
Ethane	µg/L	NV	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	0.151	J	< 0.5	U	< 0.5	U												
Ethylene	µg/L	NV	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	0.304	J	< 0.5	UJ	< 0.5	UJ												
Methane	µg/L	NV	2.1		2.5		1	J	1.2	J	1.79	J	2.32	J	< 0.5	UJ												
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	UJ	< 1	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U			< 1	U	< 1	UJ			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U												
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
1,1-Dichloroethane	µg/L	10,000	7.6		7.7		7.1		7.3		4.4		5.3		5.2				0.39	J	3.6				3.97			
1,1-Dichloroethene	µg/L	7	65		63		44		50		18		19		20				< 2	U	16.1				17.5			
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	UJ	< 0.5	UJ	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U			< 2	U	< 2	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U			< 1	U	< 1	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U	< 0.2	U			< 5	UJ	< 5	UJ			< 2	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U			< 1	U	< 1	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5	2.4		2.3		1.6		1.8		0.67	J	0.61	J	< 0.2	U			< 1	U	< 1	U			0.414	J		
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U			< 1	U	< 1	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

			Location Code	67WW08													67WW09											
			Sample ID	67WW08-191028-FD		67WW08-191028		67WW08-201103-FD		67WW08-201103		67WW08-211111		67WW08-221109		67WW08-221109-FD		67WW09-130601		67WW10-060113		67WW09-060113		67WW09-130928		67WW09-092813		67WW09-140124	
			Sample Date	10/28/2019		10/28/2019		11/3/2020		11/3/2020		11/11/2021		11/9/2022		11/9/2022		6/1/2013		6/1/2013		6/3/2013		9/28/2013		9/28/2013		1/24/2014	
			Sample Purpose	FD		REG		FD		REG		REG		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind		Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100		< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75		< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
2-Butanone	µg/L	61,000		< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U			< 10	U	< 10	U			< 5	U		
2-Chlorotoluene	µg/L	2,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U		
2-Hexanone	µg/L	6,100		< 1	U	< 1	U	< 2	U	< 2	U	< 2	U	< 1	U	< 1	U			< 10	U	< 10	U			< 5	U		
4-Chlorotoluene	µg/L	2,000		< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U		
Acetone	µg/L	92,000		< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U	< 0.4	U			< 10	U	< 10	U			< 5	U		
Benzene	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.25	U		
Bromobenzene	µg/L	2,000		< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.25	U		
Bromochloromethane	µg/L	4,100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.4	U		
Bromodichloromethane	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
Bromoform	µg/L	36		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U		
Bromomethane	µg/L	140		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U	< 0.4	U			< 2	UJ	< 2	UJ			< 1	U		
Carbon disulfide	µg/L	10,000		< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U	< 0.6	U			< 2	U	< 2	U			< 1	U		
Carbon tetrachloride	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U			< 1	U	< 1	U			< 0.5	U		
Chlorobenzene	µg/L	100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U		
Chloroethane	µg/L	41,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 2	U	< 2	U			< 1	U		
Chloroform	µg/L	1,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.25	U		
Chloromethane	µg/L	220		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 2	UJ	< 2	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
Dibromochloromethane	µg/L	34		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
Dibromomethane	µg/L	380		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	UJ			< 0.5	U		
Ethylbenzene	µg/L	700		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20		< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U			< 1	U	< 1	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000		< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U			< 2	U	< 2	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200		< 1	U	< 1	U	< 2	U	< 2	U	< 2	U	< 0.7	U	< 0.7	U			< 10	U	< 10	U			< 5	U		
Methylene chloride	µg/L	5		< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U		
Naphthalene	µg/L	2,000		< 0.5	UJ	< 0.5	UJ	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100		< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U		
o-Xylene	µg/L	10,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
Styrene	µg/L	100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
Tetrachloroethene	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
Toluene	µg/L	1,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 2	U	< 2	U			< 1	U		
Trichloroethene	µg/L	5		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U		
Vinyl chloride	µg/L	2		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09																							
		Sample ID	67WW09-012414		67WW09-140506		67WW09-140725		67WW09-072514		67WW09-141204		67WW09-120414		67WW09-150211		67WW09FD-021115		67WW09-021115		67WW09-150519		67WW09-051915		67WW09-151118		67WW09-111815	
		Sample Date	1/24/2014		5/6/2014		7/25/2014		7/25/2014		12/4/2014		12/4/2014		2/11/2015		2/11/2015		2/11/2015		5/19/2015		5/19/2015		11/18/2015		11/18/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	3.39		-	-	3.42		3.42		3.55		3.55		3.29				3.29		3.35		3.35		3.98		3.98	
Dissolved oxygen	mg/L	NV	0.86		-	-	0.61		0.61		0		0		1.02				1.02		1.13		1.13		0		0	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	136		-	-	310		310		166		166		164				164		259		259		224		224	
pH	SU	NV	6.24		-	-	5.41		5.41		5.95		5.95		6.45				6.45		5.48		5.48		5.63		5.63	
Temperature	C	NV	16.27		-	-	26.09		26.09		20.48		20.48		18.13				18.13		18.88		18.88		19.88		19.88	
Total Purge	L	NV																										
Turbidity	NTU	NV	0.9		-	-	4.4		4.4		1.8		1.8		3.4				3.4		12.5		12.5		0		0	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000	4.59						3.03				3.93				2.92		2.93				1.56				1.08	
1,1-Dichloroethene	µg/L	7	20.8						8.93				11.6				8.29		8.17				2.71				1.66	J
1,1-Dichloropropene	µg/L	3	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U					< 0.3	U			< 0.3	U			< 0.3	U	< 0.3	U			< 0.3	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	UJ					< 2	U			< 2	U			< 2	U	< 2	U			< 2	U			< 2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
1,2-Dichloroethane	µg/L	5	0.347	J					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dichloropropane	µg/L	5	< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09																							
		Sample ID	67WW09-012414		67WW09-140506		67WW09-140725		67WW09-072514		67WW09-141204		67WW09-120414		67WW09-150211		67WW09FD-021115		67WW09-021115		67WW09-150519		67WW09-051915		67WW09-151118		67WW09-111815	
		Sample Date	1/24/2014		5/6/2014		7/25/2014		7/25/2014		12/4/2014		12/4/2014		2/11/2015		2/11/2015		2/11/2015		5/19/2015		5/19/2015		11/18/2015		11/18/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
2,2-Dichloropropane	µg/L	42	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
2-Butanone	µg/L	61,000	< 5	U					< 5	U			< 5	U			< 5	U	< 5	U			< 5	U			< 5	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	UJ			< 0.25	U
2-Hexanone	µg/L	6,100	< 5	U					< 5	U			< 5	U			< 5	U	< 5	U			< 5	U			< 5	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Acetone	µg/L	92,000	< 5	U					< 5	U			< 5	U			< 5	U	< 5	U			< 5	U			< 5	U
Benzene	µg/L	5	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Bromobenzene	µg/L	2,000	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Bromochloromethane	µg/L	4,100	< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
Bromodichloromethane	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Bromoform	µg/L	36	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Bromomethane	µg/L	140	< 1	U					< 1	U			< 1	U			< 1	UJ	< 1	UJ			< 1	U			< 1	U
Carbon disulfide	µg/L	10,000	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Chlorobenzene	µg/L	100	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Chloroethane	µg/L	41,000	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Chloroform	µg/L	1,000	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Chloromethane	µg/L	220	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Hexachlorobutadiene	µg/L	20	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Isopropylbenzene	µg/L	10,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U					< 5	U			< 5	U			< 5	U	< 5	U			< 5	U			< 5	U
Methylene chloride	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Naphthalene	µg/L	2,000	< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
n-Butylbenzene	µg/L	4,100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
o-Xylene	µg/L	10,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Styrene	µg/L	100	< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Toluene	µg/L	1,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U					< 1	U			< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Trichloroethene	µg/L	5	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Vinyl chloride	µg/L	2	0.472	J					< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09																						67WW09A	
		Sample ID	67WW09FD-111815		67WW09-160518		67WW09-051816		67WW09FD-051816		67WW09-112717		67WW09-180502		67WW09-181023		67WW09-190503		67WW09-191024		67WW09-201103		67WW09-211111		67WW09-221108		67WW09A-130927	
		Sample Date	11/18/2015		5/18/2016		5/18/2016		5/18/2016		11/27/2017		5/2/2018		10/23/2018		5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		9/27/2013	
		Sample Purpose	FD		REG		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV			3.95		3.95				3.65		3.48		3.35		3.49		3.22		3.24		3.47		3.02		2.45	
Dissolved oxygen	mg/L	NV			0.6		0.6				0.09		0.2		0.1		0.13		0.09		0.42		0.5		0.04		1.19	
Ferrous Iron	NA	NV																							0.09			
Flow Rate	mL/Min	NV									100		100		100		100		100		100							
Measured well depth	Ft BTOC	NV									37.9		37.8		38		37.88		37.8									
Oxidation Reduction Potential	mV	NV			305		305				325		413		203		250		194		191		234		217		182	
pH	SU	NV			5.19		5.19				5.27		5.35		6.23		5.36		6.05		6.17		5.92		6.13		5.62	
Temperature	C	NV			18.25		18.25				19.97		19.40		18.75		20.04		21.04		17.87		20.08		20.18		28.67	
Total Purge	L	NV									0.78		2.0		3.0		3.0		3		3.0							
Turbidity	NTU	NV			0.8		0.8				31.4		4.7		0		0		0		0		1.4		0		21.5	
Water Level at Reading Time	Ft BTOC	NV									22.29		21.2		22.65		20.06		21.02		20.1							
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26									1.2																	
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U			< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000									< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U		
1,1,2-Trichloroethane	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	5.5		< 0.3	U		
1,1-Dichloroethane	µg/L	10,000	1.08				0.477	J	0.487	J	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	13		< 0.2	U		
1,1-Dichloroethene	µg/L	7	1.62	J			< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U		
1,1-Dichloropropene	µg/L	3	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U			< 0.3	U	< 0.3	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U		
1,2,3-Trichloropropane	µg/L	0.04	< 1	U			< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U			< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U			< 2	U	< 2	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
1,2-Dichlorobenzene	µg/L	600	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U		
1,2-Dichloroethane	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	29		< 0.2	U		
1,2-Dichloropropane	µg/L	5	< 0.4	U			< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09																								67WW09A	
		Sample ID	67WW09FD-111815		67WW09-160518		67WW09-051816		67WW09FD-051816		67WW09-112717		67WW09-180502		67WW09-181023		67WW09-190503		67WW09-191024		67WW09-201103		67WW09-211111		67WW09-221108		67WW09A-130927	
		Sample Date	11/18/2015		5/18/2016		5/18/2016		5/18/2016		11/27/2017		5/2/2018		10/23/2018		5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		9/27/2013	
		Sample Purpose	FD		REG		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U		
1,3-Dichloropropane	µg/L	29	< 0.4	U			< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
1,4-Dichlorobenzene	µg/L	75	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U		
2-Butanone	µg/L	61,000	< 5	U			< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U		
2-Chlorotoluene	µg/L	2,000	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
2-Hexanone	µg/L	6,100	< 5	U			< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U		
4-Chlorotoluene	µg/L	2,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U		
Acetone	µg/L	92,000	< 5	U			< 5	U	< 5	U	< 2	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U		
Benzene	µg/L	5	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Bromobenzene	µg/L	2,000	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U		
Bromochloromethane	µg/L	4,100	< 0.4	U			< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Bromodichloromethane	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Bromoform	µg/L	36	< 1	U			< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U		
Bromomethane	µg/L	140	< 1	U			< 1	UJ	< 1	UJ	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U		
Carbon disulfide	µg/L	10,000	< 1	U			< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U		
Carbon tetrachloride	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U		
Chlorobenzene	µg/L	100	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Chloroethane	µg/L	41,000	< 1	U			< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Chloroform	µg/L	1,000	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Chloromethane	µg/L	220	< 1	U			< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.4		< 0.2	U		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Dibromochloromethane	µg/L	34	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Dibromomethane	µg/L	380	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Ethylbenzene	µg/L	700	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Hexachlorobutadiene	µg/L	20	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
m,p-Xylenes	µg/L	10,000	< 1	U			< 1	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U		
Methyl isobutyl ketone	µg/L	8,200	< 5	U			< 5	U	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U		
Methylene chloride	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.4	U		
Naphthalene	µg/L	2,000	< 0.4	U			< 0.4	U	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U		
n-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U		
n-Propylbenzene	µg/L	4,100	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
o-Xylene	µg/L	10,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Styrene	µg/L	100	< 0.25	U			< 0.25	U	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Tetrachloroethene	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Toluene	µg/L	1,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
trans-1,3-Dichloropropene	µg/L	29	< 1	U			< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		
Trichloroethene	µg/L	5	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.4		< 0.2	U		
Trichlorofluoromethane	µg/L	31,000	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U		
Vinyl chloride	µg/L	2	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09A																					
		Sample ID	67WW09A-092713-FD		67WW09A-092713		67WW09A-140123		67WW09A-012314		67WW09A-140506		67WW09A-050614		67WW09A-140724		67WW09AFD-072414		67WW09A-072414		67WW09A-141203		67WW09A-120314		67WW09AFD-120314	
		Sample Date	9/27/2013		9/27/2013		1/23/2014		1/23/2014		5/6/2014		5/6/2014		7/24/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014		12/3/2014	
		Sample Purpose	FD		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																								
Nitrite	mg/L	1																								
Sulfate	mg/L	NV																								
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV																								
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV			2.45		2.49		2.49		2.53		2.53		2.36				2.36		2.31		2.31			
Dissolved oxygen	mg/L	NV			1.19		0.59		0.59		0.46		0.46		0.12				0.12		0		0			
Ferrous Iron	NA	NV																								
Flow Rate	mL/Min	NV																								
Measured well depth	Ft BTOC	NV																								
Oxidation Reduction Potential	mV	NV			182		18		18		20		20		26				26		30		30			
pH	SU	NV			5.62		6.73		6.73		5.55		5.55		6.89				6.89		6.5		6.5			
Temperature	C	NV			28.67		15.63		15.63		19.01		19.01		24.26				24.26		18.75		18.75			
Total Purge	L	NV																								
Turbidity	NTU	NV			21.5		32.1		32.1		20.7		20.7		5.8				5.8		4.3		4.3			
Water Level at Reading Time	Ft BTOC	NV																								
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																								
Ethylene	µg/L	NV																								
Methane	µg/L	NV																								
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26																								
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																								
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U	< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U	< 0.3	U			< 0.3	U	< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U	< 2	U			< 2	UJ			< 2	U			< 2	U	< 2	U			< 2	U	< 2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5	< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09A																					
		Sample ID	67WW09A-092713-FD		67WW09A-092713		67WW09A-140123		67WW09A-012314		67WW09A-140506		67WW09A-050614		67WW09A-140724		67WW09AFD-072414		67WW09A-072414		67WW09A-141203		67WW09A-120314		67WW09AFD-120314	
		Sample Date	9/27/2013		9/27/2013		1/23/2014		1/23/2014		5/6/2014		5/6/2014		7/24/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014		12/3/2014	
		Sample Purpose	FD		REG		REG		REG		REG		REG		REG		FD		REG		REG		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000	< 5	U	< 5	U			< 5	U			< 5	U			< 5	U	< 5	U			< 5	U	< 5	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
2-Hexanone	µg/L	6,100	< 5	U	< 5	U			< 5	U			< 5	U			< 5	U	< 5	U			< 5	U	< 5	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Acetone	µg/L	92,000	< 5	U	< 5	U			< 5	U			< 5	U			< 5	U	< 5	U			< 5	U	< 5	U
Benzene	µg/L	5	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
Bromobenzene	µg/L	2,000	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
Bromochloromethane	µg/L	4,100	< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Bromoform	µg/L	36	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
Bromomethane	µg/L	140	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
Chloroethane	µg/L	41,000	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
Chloroform	µg/L	1,000	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
Chloromethane	µg/L	220	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U	< 5	U			< 5	U			< 5	U			< 5	U	< 5	U			< 5	U	< 5	U
Methylene chloride	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Naphthalene	µg/L	2,000	< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Styrene	µg/L	100	< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U	< 1	U			< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09A																							
		Sample ID	67WW09A-150210		67WW09A-021015		67WW09A-150512		67WW09A-051215		67WW09A-151118		67WW09A-111815		67WW09A-160518		67WW09A-051816		67WW09A-112917		67WW09A-180503		67WW09A-181025		67WW09A-190502		67WW09A-191028	
		Sample Date	2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		5/18/2016		11/29/2017		5/3/2018		10/25/2018		5/2/2019		10/28/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	2.25		2.25		2.02		2.02		2.35		2.35		2.48		2.48		2.87		2.88		3.26		3.42		4.07	
Dissolved oxygen	mg/L	NV	0		0		0.47		0.47		0		0		0.42		0.42		0.16		1.21		0.05		0.09		0.04	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																	100		100		100		100		100	
Measured well depth	Ft BTOC	NV																	38.7		38.76		38.71		38.77		37.62	
Oxidation Reduction Potential	mV	NV	-12		-12		112		112		127		127		137		137		128		242		138		123		71	
pH	SU	NV	7.13		7.13		5.67		5.67		5.81		5.81		5.64		5.64		5.94		6.32		6.04		6.0		6.22	
Temperature	C	NV	17.83		17.83		18.84		18.84		18.3		18.3		18.55		18.55		19.55		20.30		17.79		20.8		18.51	
Total Purge	L	NV																	0.78		2		3		3		3.0	
Turbidity	NTU	NV	20.8		20.8		31.3		31.3		12		12		0		0		0		6.1		0		24		1.7	
Water Level at Reading Time	Ft BTOC	NV																	27		25.9		27.26		24.58		25.72	
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																	3.6									
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloropropene	µg/L	3			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	UJ
1,2,3-Trichloropropane	µg/L	0.04			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2			< 2	U			< 2	U			< 2	U			< 2	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dibromoethane	µg/L	0.1			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09A																							
		Sample ID	67WW09A-150210		67WW09A-021015		67WW09A-150512		67WW09A-051215		67WW09A-151118		67WW09A-111815		67WW09A-160518		67WW09A-051816		67WW09A-112917		67WW09A-180503		67WW09A-181025		67WW09A-190502		67WW09A-191028	
		Sample Date	2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		5/18/2016		11/29/2017		5/3/2018		10/25/2018		5/2/2019		10/28/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 2	U	< 1	U	< 1	U
Benzene	µg/L	5			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140			< 1	UJ			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Ethylbenzene	µg/L	700			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
Isopropylbenzene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Methylene chloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	UJ
n-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09A						67WW10																	
		Sample ID	67WW09A-201102		67WW09A-211110		67WW09A-221109		67WW10-130601		67WW10-130927		67WW10-092713		67WW10-140124		67WW10-012414		67WW10-140506		67WW10-050614		67WW10-140724		67WW10-072414		67WW10-141203	
		Sample Date	11/2/2020		11/10/2021		11/9/2022		6/1/2013		9/27/2013		9/27/2013		1/24/2014		1/24/2014		5/6/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	4.93		4.77		4.76		5.08		6.23		6.23		6.45		6.45		6.02		6.02		6.13		6.13		6.09	
Dissolved oxygen	mg/L	NV	0.06		0.26		0.04		0.11		0.6		0.6		0.54		0.54		0.44		0.44		0.52		0.52		0	
Ferrous Iron	NA	NV					0.05																					
Flow Rate	mL/Min	NV	100																									
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	75		184		61		190		-9		-9		29		29		55		55		174		174		83	
pH	SU	NV	6.44		5.99		6.32		6.27		6.02		6.02		6.07		6.07		5.29		5.29		5.59		5.59		5.56	
Temperature	C	NV	19.86		21.21		19.65		24.32		25.2		25.2		15.1		15.1		20.2		20.2		22.24		22.24		19.2	
Total Purge	L	NV	3.0																									
Turbidity	NTU	NV	0		5.7		23.2		4.9		1.6		1.6		0.4		0.4		2.6		2.6		54.7		54.7		9.1	
Water Level at Reading Time	Ft BTOC	NV	24.98																									
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 1	U	< 0.5	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 1	U	< 1	U	< 0.5	U																				
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1-Dichloroethane	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.2	U					0.362	J			0.319	J			< 0.25	U			< 0.25	U		
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.2	U					< 1	U			< 1	U			< 1	U			< 1	U		
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310	< 1	U	< 1	U	< 0.4	U					< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04	< 1	U	< 1	U	< 0.5	U					< 1	U			< 1	U			< 1	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70	< 1	U	< 1	U	< 0.5	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 1	U	< 0.2	U					< 2	U			< 2	U			< 2	U			< 2	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600	< 1	U	< 1	U	< 0.5	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 1	U	< 0.5	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW09A						67WW10																	
		Sample ID	67WW09A-201102		67WW09A-211110		67WW09A-221109		67WW10-130601		67WW10-130927		67WW10-092713		67WW10-140124		67WW10-012414		67WW10-140506		67WW10-050614		67WW10-140724		67WW10-072414		67WW10-141203	
		Sample Date	11/2/2020		11/10/2021		11/9/2022		6/1/2013		9/27/2013		9/27/2013		1/24/2014		1/24/2014		5/6/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100	< 1	U	< 1	U	< 0.4	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 1	U	< 0.3	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75	< 1	U	< 1	U	< 0.4	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 0.5	U					< 5	U			< 5	U			< 5	U			< 5	U		
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 1	U	< 0.3	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
2-Hexanone	µg/L	6,100	< 2	U	< 2	U	< 1	U					< 5	U			< 5	U			< 5	U			< 5	U		
4-Chlorotoluene	µg/L	2,000	< 1	U	< 1	U	< 0.4	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Acetone	µg/L	92,000	< 1	U	< 2	U	< 0.4	U					< 5	U			< 5	U			< 5	U			< 5	U		
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Bromobenzene	µg/L	2,000	< 1	U	< 1	U	< 0.4	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.2	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Bromoform	µg/L	36	< 0.5	U	< 1	U	< 0.4	U					< 1	U			< 1	U			< 1	U			< 1	U		
Bromomethane	µg/L	140	< 0.5	U	< 1	U	< 0.4	U					< 1	U			< 1	U			< 1	U			< 1	U		
Carbon disulfide	µg/L	10,000	< 1	U	< 2	U	< 0.6	U					< 1	U			< 1	U			< 1	U			< 1	U		
Carbon tetrachloride	µg/L	5	< 0.5	U	< 1	U	< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	100	< 0.5	U	< 1	U	< 0.3	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloroethane	µg/L	41,000	< 0.5	U	< 1	U	< 0.3	U					< 1	U			< 1	U			< 1	U			< 1	U		
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.2	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.2	U					< 1	U			< 1	U			< 1	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	34	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	700	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20	< 1	U	< 1	U	< 1	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 0.5	U					< 1	U			< 1	U			< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200	< 2	U	< 2	U	< 0.7	U					< 5	U			< 5	U			< 5	U			< 5	U		
Methylene chloride	µg/L	5	< 1	U	< 2	U	< 0.4	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Naphthalene	µg/L	2,000	< 0.5	U	< 1	U	< 0.3	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100	< 1	U	< 1	U	< 0.4	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 0.3	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
o-Xylene	µg/L	10,000	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Styrene	µg/L	100	< 0.5	U	< 1	U	< 0.3	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.2	U					< 1	U			< 1	U			< 1	U			< 1	U		
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 1	U	< 0.3	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.2	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW10																							
		Sample ID	67WW10-120314		67WW10-150210		67WW10-021015		67WW10-150512		67WW10-051215		67WW10-151118		67WW10-111815		67WW10-160518		67WW10-051816		67WW10-112917		67WW10-180503		67WW10-181022		67WW10-190502	
		Sample Date	12/3/2014		2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		5/18/2016		11/29/2017		5/3/2018		10/22/2018		5/2/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	6.09		5.84		5.84		5.65		5.65		5.95		5.95		6.36		6.36		5.12		5.53		5.17		5.80	
Dissolved oxygen	mg/L	NV	0		0		0		0.64		0.64		0.1		0.1		0.5		0.5		0.32		1.16		0.18		0.06	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																			100		100		100		100	
Measured well depth	Ft BTOC	NV																			50.65		50.6		50.9		50.8	
Oxidation Reduction Potential	mV	NV	83		25		25		117		117		68		68		163		163		221		284		178		157	
pH	SU	NV	5.56		6.18		6.18		5.53		5.53		5.77		5.77		5.02		5.02		5.01		5.86		5.51		5.37	
Temperature	C	NV	19.2		17.33		17.33		18.78		18.78		17.68		17.68		18.66		18.66		19.32		22.03		18.54		20.46	
Total Purge	L	NV																			0.78		2.0		3.0		3.0	
Turbidity	NTU	NV	9.1		0		0		217		217		90.8		90.8		30.9		30.9		42		22.9		31.2		25.4	
Water Level at Reading Time	Ft BTOC	NV																			25.6		23.93		25.88		22.53	
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																			0.23							
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																			< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000	0.173	J			< 0.25	U			< 0.25	U			0.14	J			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloropropene	µg/L	3	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U			< 2	U			< 2	U			< 2	U			< 2	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW10																							
		Sample ID	67WW10-120314		67WW10-150210		67WW10-021015		67WW10-150512		67WW10-051215		67WW10-151118		67WW10-111815		67WW10-160518		67WW10-051816		67WW10-112917		67WW10-180503		67WW10-181022		67WW10-190502	
		Sample Date	12/3/2014		2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		5/18/2016		11/29/2017		5/3/2018		10/22/2018		5/2/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000	< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100	< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000	< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 2	U	< 1	U
Benzene	µg/L	5	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140	< 1	U			< 1	UJ			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U
Methylene chloride	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000	< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100	< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW10								67WW11													
		Sample ID	67WW10-191028		67WW10-201102		67WW10-211110		67WW10-221109		67WW11-130601		67WW11-060113-FD		67WW11-060113		67WW11-131002		67WW11-100213		67WW11 FD-012314		67WW11-140123		67WW11FD-012314	
		Sample Date	10/28/2019		11/2/2020		11/10/2021		11/9/2022		6/1/2013		6/1/2013		6/1/2013		10/2/2013		10/2/2013		1/23/2014		1/23/2014		1/23/2014	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG		FD		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																	< 2	U						
Nitrite	mg/L	1																	< 2	U						
Sulfate	mg/L	NV																	375							
Sulfide	mg/L	NV																	< 1	U						
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																	17.6							
Total Organic Carbon	mg/L	NV																	5.7							
DHC																										
BVC	cells/mL	NV																	0.5	U						
Dehalococcoides	cells/mL	NV																	0.5	U						
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	5.1		5.58		5.25		5.12		4.27				4.27		4.74		4.74				4.77			
Dissolved oxygen	mg/L	NV	0.03		0.15		0.27		0.03		1.17				1.17		0.63		0.63				0.48			
Ferrous Iron	NA	NV							3.92																	
Flow Rate	mL/Min	NV	100		100																					
Measured well depth	Ft BTOC	NV	50.68																							
Oxidation Reduction Potential	mV	NV	164		115		201		92		168				168		64		64				129			
pH	SU	NV	5.34		5.62		4.89		5.39		6.78				6.78		6.23		6.23				5.84			
Temperature	C	NV	18.48		19.34		19.67		19.26		23.9				23.9		22.65		22.65				17.25			
Total Purge	L	NV	3.0		3																					
Turbidity	NTU	NV	160		57.1		78.3		122		9.6				9.6		4		4				1.9			
Water Level at Reading Time	Ft BTOC	NV	24.3		23.39																					
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																	< 2	U						
Ethylene	µg/L	NV																	< 2	U						
Methane	µg/L	NV																	< 2	J						
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																	< 0.04	U						
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26																								
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 1	UJ	< 1	UJ			< 0.4	U	< 0.4	U			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 1	U	< 1	U	< 0.5	U																
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			10.6		10.6				10.6		10.7				10.7	
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			46.8		47.1				42.8		43				43	
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.3	U	< 0.3	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 2	U	< 2	U			< 1	U	< 1	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 1	U			< 0.4	U	< 0.4	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U			< 5	UJ	< 5	UJ			< 2	U	< 2	U			< 2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			0.85	J	0.869	J			0.799	J	0.823	J			0.823	J
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 1	U	< 1	U			< 0.4	U	< 0.4	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

	Location Code	67WW10								67WW11													
	Sample ID	67WW10-191028		67WW10-201102		67WW10-211110		67WW10-221109		67WW11-130601		67WW11-060113-FD		67WW11-060113		67WW11-131002		67WW11-100213		67WW11 FD-012314		67WW11-140123		67WW11FD-012314	
	Sample Date	10/28/2019		11/2/2020		11/10/2021		11/9/2022		6/1/2013		6/1/2013		6/1/2013		10/2/2013		10/2/2013		1/23/2014		1/23/2014		1/23/2014	
	Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG		FD		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.4	U	< 0.4	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 1	U	< 0.5	U			< 10	U	< 10	U			< 5	U	< 5	U			< 5	U
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
2-Hexanone	µg/L	6,100	< 1	U	< 2	U	< 2	U	< 1	U			< 10	U	< 10	U			< 5	U	< 5	U			< 5	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Acetone	µg/L	92,000	< 1	U	< 1	U	< 2	U	< 0.4	U			< 10	U	< 10	U			33.6		< 5	U			< 5	U
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
Bromobenzene	µg/L	2,000	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.4	U	< 0.4	U			< 0.4	U
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Bromoform	µg/L	36	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 2	U	< 2	U			< 1	U	< 1	U			< 1	U
Bromomethane	µg/L	140	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 2	UJ	< 2	UJ			< 1	U	< 1	U			< 1	U
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U	< 2	U	< 0.6	U			< 2	U	< 2	U			< 1	U	< 1	U			< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
Chloroethane	µg/L	41,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 2	U	< 2	U			< 1	U	< 1	U			< 1	U
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 2	U	< 2	UJ			0.536	J	< 1	U			< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Hexachlorobutadiene	µg/L	20	< 0.5	U	< 1	U	< 1	U	< 1	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 0.5	U			< 2	U	< 2	U			< 1	U	< 1	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 1	U	< 2	U	< 2	U	< 0.7	U			< 10	U	< 10	U			< 5	U	< 5	U			< 5	U
Methylene chloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Naphthalene	µg/L	2,000	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.4	U	< 0.4	U			< 0.4	U
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Styrene	µg/L	100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.25	U	< 0.25	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 2	U	< 2	U			< 1	U	< 1	U			< 1	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 0.5	U	0.296	J			0.296	J

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW11																							
		Sample ID	67WW11-012314		67WW11-140506		67WW11-072414		67WW11-140724		67WW11-141204		67WW11-120414		67WW11-150211		67WW11-021115		67WW11-150519		67WW11-051915		67WW11-151119		67WW11-111915		67WW11-160519	
		Sample Date	1/23/2014		5/6/2014		7/24/2014		7/24/2014		12/4/2014		12/4/2014		2/11/2015		2/11/2015		5/19/2015		5/19/2015		11/19/2015		11/19/2015		5/19/2016	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV											1,330				1,350								1,380			
Nitrate	mg/L	10					< 1	U					2	J			< 2	U							< 2	U		
Nitrite	mg/L	1					< 1	U					1.97	J			< 2	U							< 2	U		
Sulfate	mg/L	NV					414						424				389								376			
Sulfide	mg/L	NV															< 1	U							< 1	U		
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV					49.4						140				121								113			
Total Organic Carbon	mg/L	NV					8.7						9.1	J			12.9								23.1			
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	4.77			-	4.85		4.85		5.17		5.17		4.8		4.8		4.47		4.47		4.89		4.89		5.19	
Dissolved oxygen	mg/L	NV	0.48		-	-	1.07		1.07		0		0		0		0		0.69		0.69		0.18		0.18		0.74	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	129		-	-	194		194		204		204		165		165		246		246		183		183		169	
pH	SU	NV	5.84		-	-	6.72		6.72		5.63		5.63		6.04		6.04		5.49		5.49		5.61		5.61		5.87	
Temperature	C	NV	17.25			-	22		22		19.1		19.1		18.42		18.42		19.2		19.2		18.49		18.49		18.29	
Total Purge	L	NV																										
Turbidity	NTU	NV	1.9		-	-	2.9		2.9		5.6		5.6		4.7		4.7		105		105		25.9		25.9		1.2	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV											364,000															
Ethane	µg/L	NV					< 2	U					< 2	U			< 2	U							< 2	U		
Ethylene	µg/L	NV					< 2	U					< 2	U			< 2	U							< 2	U		
Methane	µg/L	NV					< 2	U					2.41	J			1.78	J							2.11	J		
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV					< 0.04	U					< 0.04	U			< 0.04	U							< 0.04	U		
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U			< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,1-Dichloroethane	µg/L	10,000	9.83				10.4						11.1				9.81				8.25				8.54			
1,1-Dichloroethene	µg/L	7	38.8				34.5						37.5				30.4				21.6				28.5			
1,1-Dichloropropene	µg/L	3	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U			< 0.3	U					< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U			< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U			< 2	U					< 2	U			< 2	U			< 2	U			< 2	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5	0.748	J			0.684	J					0.567	J			0.559	J			0.518	J			0.513	J		
1,2-Dichloropropane	µg/L	5	< 0.4	U			< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW11																							
		Sample ID	67WW11-012314		67WW11-140506		67WW11-072414		67WW11-140724		67WW11-141204		67WW11-120414		67WW11-150211		67WW11-021115		67WW11-150519		67WW11-051915		67WW11-151119		67WW11-111915		67WW11-160519	
		Sample Date	1/23/2014		5/6/2014		7/24/2014		7/24/2014		12/4/2014		12/4/2014		2/11/2015		2/11/2015		5/19/2015		5/19/2015		11/19/2015		11/19/2015		5/19/2016	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29	< 0.4	U			< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
2-Butanone	µg/L	61,000	< 5	U			< 5	U					< 5	U			< 5	U			< 5	U			< 5	U		
2-Chlorotoluene	µg/L	2,000	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
2-Hexanone	µg/L	6,100	< 5	U			< 5	U					< 5	U			< 5	U			< 5	U			< 5	U		
4-Chlorotoluene	µg/L	2,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Acetone	µg/L	92,000	< 5	U			< 5	U					< 5	U			< 5	U			< 5	U			< 5	U		
Benzene	µg/L	5	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Bromobenzene	µg/L	2,000	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Bromochloromethane	µg/L	4,100	< 0.4	U			< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
Bromodichloromethane	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Bromoform	µg/L	36	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
Bromomethane	µg/L	140	< 1	U			< 1	U					< 1	U			< 1	UJ			< 1	U			< 1	U		
Carbon disulfide	µg/L	10,000	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
Carbon tetrachloride	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	100	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloroethane	µg/L	41,000	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
Chloroform	µg/L	1,000	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloromethane	µg/L	220	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	34	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	380	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	700	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200	< 5	U			< 5	U					< 5	U			< 5	U			< 5	U			< 5	U		
Methylene chloride	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Naphthalene	µg/L	2,000	< 0.4	U			< 0.4	U					< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
o-Xylene	µg/L	10,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Styrene	µg/L	100	< 0.25	U			< 0.25	U					< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Toluene	µg/L	1,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29	< 1	U			< 1	U					< 1	U			< 1	U			< 1	U			< 1	U		
Trichloroethene	µg/L	5	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000	< 0.5	U			< 0.5	U					< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Vinyl chloride	µg/L	2	< 0.5	U			0.271	J					0.302	J			< 0.5	U			< 0.5	U			0.333	J		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW11																		67WW12							
		Sample ID	67WW11-051916		67WW11-112717		67WW11-180502		67WW11-181023		67WW11-190501		67WW11-191024		67WW11-201103		67WW11-211111		67WW11-221108		67WW12-130601		67WW12-060113		67WW12-131001		67WW12-100113	
		Sample Date	5/19/2016		11/27/2017		5/2/2018		10/23/2018		5/1/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		6/1/2013		6/1/2013		10/1/2013		10/1/2013	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV	1,430																									
Nitrate	mg/L	10	< 2	U																								
Nitrite	mg/L	1	< 2	U																								
Sulfate	mg/L	NV	409																									
Sulfide	mg/L	NV	< 1	U																								
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV	74.8																									
Total Organic Carbon	mg/L	NV	22.1																									
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	5.19		5.15		4.94		4.99		4.65		4.73		4.87		4.68		4.72		4.4		4.4		4.54		4.54	
Dissolved oxygen	mg/L	NV	0.74		0.19		0.21		0.07		0.5		0.04		0.05		0.76		0.06		0.57		0.57		0.66		0.66	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV			100		100		100		100		100		100													
Measured well depth	Ft BTOC	NV			46.68		46.63		47.05		46.64		46.6															
Oxidation Reduction Potential	mV	NV	169		291		415		171		195		187		29		172		196		175		175		-119		-119	
pH	SU	NV	5.87		5.87		5.58		6.45		5.29		6.23		6.38		6.19		6.27		6.71		6.71		6.31		6.31	
Temperature	C	NV	18.29		19.49		19.77		18.02		20.60		21.72		19.92		18.48		19.88		27.34		27.34		22.99		22.99	
Total Purge	L	NV			0.91		1.5		1.5		3.0		3.0		3.0													
Turbidity	NTU	NV	1.2		20.7		8		1.9		7.8		0		0		2.1		0		2.7		2.7		0.3		0.3	
Water Level at Reading Time	Ft BTOC	NV			23.77		22.43		24.14		21.44		22.5		21.54													
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV	< 2	U																								
Ethylene	µg/L	NV	< 2	U																								
Methane	µg/L	NV	< 2	U																								
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV	< 0.04	U																								
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26			18																							
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 1	UJ			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000			< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U								
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000	6.58		3.6		3.3		3.8		1.9	J	1.9		1.3		0.57	J	< 0.2	U			< 1	U			< 0.25	U
1,1-Dichloroethene	µg/L	7	19.3		5.2		5.5		6.1		2.8		1.9		1.2		< 0.5	U	< 0.2	U			< 2	U			< 1	U
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 2	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 1	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U			< 5	UJ			< 2	UJ
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 1	U			< 0.25	U
1,2-Dichloroethane	µg/L	5	0.396	J	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
1,2-Dichloropropane	µg/L	5	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 1	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

Location Code			67WW11																67WW12							
Sample ID			67WW11-051916		67WW11-112717		67WW11-180502		67WW11-181023		67WW11-190501		67WW11-191024		67WW11-201103		67WW11-211111		67WW11-221108		67WW12-130601		67WW12-060113		67WW12-131001		67WW12-100113	
Sample Date			5/19/2016		11/27/2017		5/2/2018		10/23/2018		5/1/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		6/1/2013		6/1/2013		10/1/2013		10/1/2013	
Sample Purpose			REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.25	U
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U			< 1	U			< 0.5	U
2-Butanone	µg/L	61,000	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 10	U			< 5	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.25	U
2-Hexanone	µg/L	6,100	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U			< 10	U			< 5	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.5	U
Acetone	µg/L	92,000	< 5	U	< 2	U	< 1	U	< 2	U	5.6		< 1	U	< 1	U	< 2	U	< 0.4	U			< 10	U			< 5	U
Benzene	µg/L	5	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.25	U
Bromobenzene	µg/L	2,000	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.25	U
Bromochloromethane	µg/L	4,100	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.4	U
Bromodichloromethane	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
Bromoform	µg/L	36	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 2	U			< 1	U
Bromomethane	µg/L	140	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 2	UJ			< 1	U
Carbon disulfide	µg/L	10,000	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U			< 2	U			< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 1	U			< 0.5	U
Chlorobenzene	µg/L	100	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.25	U
Chloroethane	µg/L	41,000	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 2	U			< 1	U
Chloroform	µg/L	1,000	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.25	U
Chloromethane	µg/L	220	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 2	UJ			< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Hexachlorobutadiene	µg/L	20	< 0.5	UJ	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U			< 1	U			< 0.5	U
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 2	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U			< 10	U			< 5	U
Methylene chloride	µg/L	5	< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U			< 1	U			< 0.5	U
Naphthalene	µg/L	2,000	< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.4	U
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.25	U
o-Xylene	µg/L	10,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			0.299	J			< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Styrene	µg/L	100	< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Toluene	µg/L	1,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 2	U			< 1	U
Trichloroethene	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW12																							
		Sample ID	67WW12-140124		67WW12-012414		67WW12-140506		67WW12-050614		67WW12-140725		67WW12-072514		67WW12-141203		67WW12-120314		67WW12-150210		67WW12-021015		67WW12-150512		67WW12-051215		67WW12FFD-111815	
		Sample Date	1/24/2014		1/24/2014		5/6/2014		5/6/2014		7/25/2014		7/25/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	4.12		4.12		4.56		4.56		4.52		4.52		5.21		5.21		3.37		3.37		3.34		3.34			
Dissolved oxygen	mg/L	NV	0.62		0.62		0.8		0.8		0.21		0.21		0		0		0.17		0.17		1.23		1.23			
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	91		91		43		43		12		12		20		20		139		139		54		54			
pH	SU	NV	6.22		6.22		5.39		5.39		6.36		6.36		6.06		6.06		5.32		5.32		5.41		5.41			
Temperature	C	NV	15.69		15.69		20.51		20.51		22.61		22.61		19.09		19.09		19.7		19.7		18.55		18.55			
Total Purge	L	NV																										
Turbidity	NTU	NV	0		0		5.2		5.2		10.8		10.8		0.5		0.5		2.1		2.1		0		0			
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U
1,1-Dichloroethene	µg/L	7			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U
1,1-Dichloropropene	µg/L	3			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U			< 0.3	U	< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U
1,2,4-Trichlorobenzene	µg/L	70			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2			< 2	U			< 2	U			< 2	U			< 2	U			< 2	U			< 2	U	< 2	U
1,2-Dibromoethane	µg/L	0.1			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U
1,2-Dichloroethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW12																							
		Sample ID	67WW12-140124		67WW12-012414		67WW12-140506		67WW12-050614		67WW12-140725		67WW12-072514		67WW12-141203		67WW12-120314		67WW12-150210		67WW12-021015		67WW12-150512		67WW12-051215		67WW12FFD-111815	
		Sample Date	1/24/2014		1/24/2014		5/6/2014		5/6/2014		7/25/2014		7/25/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U
1,4-Dichlorobenzene	µg/L	75			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U
2,2-Dichloropropane	µg/L	42			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 5	U
2-Chlorotoluene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U
2-Hexanone	µg/L	6,100			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 5	U
4-Chlorotoluene	µg/L	2,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
Acetone	µg/L	92,000			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U	< 5	U
Benzene	µg/L	5			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U
Bromobenzene	µg/L	2,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U
Bromochloromethane	µg/L	4,100			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U
Bromodichloromethane	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U
Bromoform	µg/L	36			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U
Bromomethane	µg/L	140			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U	< 1	U
Carbon disulfide	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Carbon tetrachloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloroethane	µg/L	41,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Chloroform	µg/L	1,000			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
Chloromethane	µg/L	220			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	34			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	380			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	700			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200			< 5	U			< 5	U			< 5	U			< 5	U			< 5	U			< 5	UJ	< 5	U
Methylene chloride	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Naphthalene	µg/L	2,000			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
o-Xylene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Styrene	µg/L	100			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Toluene	µg/L	1,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U			< 1	U		
Trichloroethene	µg/L	5			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		
Vinyl chloride	µg/L	2			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U			< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW12																					
		Sample ID	67WW12-151118		67WW12-111815		67WW12-151216		67WW12-161215 DUP		67WW12-161215		67WW12-161215DUP		67WW12-160518		67WW12-051816		67WW12-112917		67WW12-112917-FD		67WW12-180503		67WW12-181022	
		Sample Date	11/18/2015		11/18/2015		12/16/2015		12/16/2015		12/16/2015		12/16/2015		5/18/2016		5/18/2016		11/29/2017		11/29/2017		5/3/2018		10/22/2018	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																								
Nitrite	mg/L	1																								
Sulfate	mg/L	NV																								
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV																								
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	3.69		3.69		4.66				4.66				4.06		4.06		5.17				3.87		5.24	
Dissolved oxygen	mg/L	NV	0.05		0.05		0				0				0.36		0.36		0.43				0.58		0.29	
Ferrous Iron	NA	NV																								
Flow Rate	mL/Min	NV																	100				100		100	
Measured well depth	Ft BTOC	NV																	36.93				36.93		37.08	
Oxidation Reduction Potential	mV	NV	178		178		50				50				221		221		209				300		209	
pH	SU	NV	5.21		5.21		5.85				5.85				4.96		4.96		5.52				5.34		5.68	
Temperature	C	NV	17.95		17.95		19.38				19.38				18.41		18.41		19.71				20.79		18.77	
Total Purge	L	NV																	0.78				2.5		3	
Turbidity	NTU	NV	3.1		3.1		11				11				5.7		5.7		0				0		0	
Water Level at Reading Time	Ft BTOC	NV																	26.26				25.01		26.55	
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																								
Ethylene	µg/L	NV																								
Methane	µg/L	NV																								
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26							< 1	U	< 1	U	< 1	U					0.6	J	0.48	J				
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14			< 0.4	U											< 0.4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7			< 1	U											0.681	J	2.2		1.8		< 0.5	U	4.8	
1,1-Dichloropropene	µg/L	3			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310			< 0.3	U											< 0.3	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2,3-Trichloropropane	µg/L	0.04			< 1	U											< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70			< 0.4	U											< 0.4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2			< 2	U											< 2	U	< 1	U	< 1	U	< 0.5	U	< 1	U
1,2-Dibromoethane	µg/L	0.1			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5			< 0.4	U											< 0.4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

	Location Code	67WW12																					
	Sample ID	67WW12-151118		67WW12-111815		67WW12-151216		67WW12-161215 DUP		67WW12-161215		67WW12-161215DUP		67WW12-160518		67WW12-051816		67WW12-112917		67WW12-112917-FD		67WW12-180503		67WW12-181022	
	Sample Date	11/18/2015		11/18/2015		12/16/2015		12/16/2015		12/16/2015		12/16/2015		5/18/2016		5/18/2016		11/29/2017		11/29/2017		5/3/2018		10/22/2018	
	Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29			< 0.4	U											< 0.4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000			< 5	U											< 5	U	< 2	U	< 2	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100			< 5	U											< 5	U	< 2	U	< 2	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000			< 5	U											< 5	U	< 2	U	< 2	U	< 1	U	< 2	U
Benzene	µg/L	5			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100			< 0.4	U											< 0.4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36			< 1	U											< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140			< 1	U											< 1	UJ	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000			< 1	U											< 1	U	< 2	U	< 2	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000			< 1	U											< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220			< 1	U											< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	UJ
Ethylbenzene	µg/L	700			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U
Isopropylbenzene	µg/L	10,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000			< 1	U											< 1	U	< 2	U	< 2	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200			< 5	U											< 5	U	< 2	U	< 2	U	< 1	U	< 1	U
Methylene chloride	µg/L	5			< 0.5	U											< 0.5	U	< 2	U	< 2	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000			< 0.4	U											< 0.4	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
n-Butylbenzene	µg/L	4,100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100			< 0.25	U											< 0.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29			< 1	U											< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2			< 0.5	U											< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW12										67WW13													
		Sample ID	67WW12-190502		67WW12-191028		67WW12-201102		67WW12-211110		67WW12-221108		67WW13-130531		67WW13-053113		67WW13-131001		67WW13-100113		67WW13-140124		67WW13-012414		67WW13FD-012414		67WW13-140506	
		Sample Date	5/2/2019		10/28/2019		11/2/2020		11/10/2021		11/8/2022		5/31/2013		5/31/2013		10/1/2013		10/1/2013		1/24/2014		1/24/2014		1/24/2014		5/6/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																								
Nitrite	mg/L	1																								
Sulfate	mg/L	NV																								
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV																								
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	3.56		4.35		5.10		3.42				5.55		5.55		6.65		6.65		6.87		6.87				6.16	
Dissolved oxygen	mg/L	NV	0.61		0.62		0.07		1.35		0.15		1.17		1.17		0.98		0.98		0.16		0.16				2.03	
Ferrous Iron	NA	NV									0.27																	
Flow Rate	mL/Min	NV	100		100		100																					
Measured well depth	Ft BTOC	NV	36.94		36.85																							
Oxidation Reduction Potential	mV	NV	187		126		55		244		76		106		106		37		37		125		125				122	
pH	SU	NV	5.35		5.72		6.31		5.23		6.27		6.68		6.68		7.09		7.09		6.76		6.76				5.86	
Temperature	C	NV	20.12		18.62		19.17		18.82		19.83		34.55		34.55		21.97		21.97		15.8		15.8				25.17	
Total Purge	L	NV	3.0		3		3.0																					
Turbidity	NTU	NV	6.3		1.8		0		2.1		0		0.2		0.2		0.3		0.3		0		0				1.2	
Water Level at Reading Time	Ft BTOC	NV	24.05		25.12		23.99																					
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																								
Ethylene	µg/L	NV																								
Methane	µg/L	NV																								
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26																								
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 10	U			< 0.4	U			< 1	U	< 1	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U																
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			2.91	J			3.37				2.99		3.01			
1,1-Dichloroethane	µg/L	10,000	< 0.5	U	0.51	J	1.1		< 0.5	U	< 0.2	U			30.6				33.8				32.7		32.4			
1,1-Dichloroethene	µg/L	7	2.1		17		40		6.5		40				498				515				572		569			
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	U	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.3	U			< 0.75	U	< 0.75	U		
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 20	U			< 1	U			< 2.5	U	< 2.5	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 1	U			< 0.4	U			< 1	U	< 1	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U			< 50	U			< 2	UJ			< 5	UJ	< 5	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 10	U			< 0.25	U			< 0.626	U	< 0.626	U		
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			19.9				23.8				22.9		22.9			
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 10	U			< 0.4	U			< 1	U	< 1	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW12										67WW13													
		Sample ID	67WW12-190502		67WW12-191028		67WW12-201102		67WW12-211110		67WW12-221108		67WW13-130531		67WW13-053113		67WW13-131001		67WW13-100113		67WW13-140124		67WW13-012414		67WW13FD-012414		67WW13-140506	
		Sample Date	5/2/2019		10/28/2019		11/2/2020		11/10/2021		11/8/2022		5/31/2013		5/31/2013		10/1/2013		10/1/2013		1/24/2014		1/24/2014		1/24/2014		5/6/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.4	U			< 1	U	< 1	U		
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 10	U			< 0.25	U			< 0.626	U	< 0.626	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 10	U			< 5	U			< 12.5	U	< 12.5	U		
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.25	U			< 0.626	U	< 0.626	U		
2-Hexanone	µg/L	6,100	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U			< 10	U			< 5	U			< 12.5	U	< 12.5	U		
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
Acetone	µg/L	92,000	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U			< 100	U			< 5	U			< 12.5	U	< 12.5	U		
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.25	U			< 0.626	U	< 0.626	U		
Bromobenzene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U			< 0.25	U			< 0.626	U	< 0.626	U		
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U			< 0.4	U			< 1	U	< 1	U		
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
Bromoform	µg/L	36	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 2	U			< 1	U			< 2.5	U	< 2.5	U		
Bromomethane	µg/L	140	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 20	U			< 1	U			< 2.5	U	< 2.5	U		
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U			< 20	U			< 1	U			< 2.5	U	< 2.5	U		
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.25	U			< 0.626	U	< 0.626	U		
Chloroethane	µg/L	41,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 2	U			< 1	U			< 2.5	U	< 2.5	U		
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			0.462	J			< 0.25	UJ			< 0.626	U	0.359	J		
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 2	U			< 1	U			< 2.5	U	< 2.5	U		
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			1.68				1.66				1.67	J	1.77	J		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Hexachlorobutadiene	µg/L	20	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 2	U			< 1	U			< 2.5	U	< 2.5	U		
Methyl isobutyl ketone	µg/L	8,200	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U			< 100	U			< 5	U			< 12.5	U	< 12.5	U		
Methylene chloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
Naphthalene	µg/L	2,000	< 0.5	U	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.4	U			< 1	U	< 1	U		
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.25	U			< 0.626	U	< 0.626	U		
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Styrene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.25	U			< 0.626	U	< 0.626	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U			< 0.5	U			< 1.25	U	< 1.25	U		
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 2	U			< 1	U			< 2.5	U	< 2.5	U		
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			3.11				2.81				2.86		2.99			
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U			< 0.5	U			< 1.25	U	< 1.25	U		
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			2.55				2.1				2.37	J	2.37	J		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW13																							
		Sample ID	67WW13-050614		67WW13FD-050614		67WW13-140725		67WW13FD-072514		67WW13-072514		67WW13-141204		67WW13FD-120414		67WW13-120414		67WW13-150211		67WW13-021115		67WW13-150325		67WW13-032515		67WW13-150519	
		Sample Date	5/6/2014		5/6/2014		7/25/2014		7/25/2014		7/25/2014		12/4/2014		12/4/2014		12/4/2014		2/11/2015		2/11/2015		3/25/2015		3/25/2015		5/19/2015	
		Sample Purpose	REG		FD		REG		FD		REG		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																							1,820			
Nitrate	mg/L	10																							< 2	U		
Nitrite	mg/L	1																							< 2	U		
Sulfate	mg/L	NV																							334			
Sulfide	mg/L	NV																							< 1	U		
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																							144			
Total Organic Carbon	mg/L	NV																							16.8	J		
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	6.16				6.83				6.83		6.81				6.81		6.08		6.08		6.54		6.54		5.52	
Dissolved oxygen	mg/L	NV	2.03				1.19				1.19		0.29				0.29		1.73		1.73		1.55		1.55		1.25	
Ferrous Iron	NA	NV																										
Flow Rate	mL/Min	NV																										
Measured well depth	Ft BTOC	NV																										
Oxidation Reduction Potential	mV	NV	122				178				178		150				150		145		145		176		176		219	
pH	SU	NV	5.86				6.24				6.24		6.46				6.46		7.16		7.16		4.62		4.62		5.95	
Temperature	C	NV	25.17				25.2				25.2		19.85				19.85		16.69		16.69		20.67		20.67		20.22	
Total Purge	L	NV																										
Turbidity	NTU	NV	1.2				0.2				0.2		0				0		0.2		0.2		0		0		0	
Water Level at Reading Time	Ft BTOC	NV																										
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																							< 2	U		
Ethylene	µg/L	NV																							< 2	U		
Methane	µg/L	NV																							< 2	U		
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																							< 0.04	U		
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,1,1-Trichloroethane	µg/L	200	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.8	U	< 0.8	U			< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U						
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																										
1,1,2-Trichloroethane	µg/L	5	1.99	J	1.95	J			3.56		3.48				4.56	J	4.4	J			4.87							
1,1-Dichloroethane	µg/L	10,000	15.5		14.4				22.1		21.9				27.4		28.8				29.1							
1,1-Dichloroethene	µg/L	7	240		228				362		353				522		572				521							
1,1-Dichloropropene	µg/L	3	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,2,3-Trichlorobenzene	µg/L	310	< 0.6	U	< 0.6	U			< 0.3	U	< 0.3	U			< 1.5	U	< 1.5	U			< 0.75	U						
1,2,3-Trichloropropane	µg/L	0.04	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
1,2,4-Trichlorobenzene	µg/L	70	< 0.8	U	< 0.8	U			< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U						
1,2,4-Trimethylbenzene	µg/L	5,100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 4	U	< 4	U			< 2	U	< 2	U			< 10	U	< 10	U			< 5	U						
1,2-Dibromoethane	µg/L	0.1	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
1,2-Dichloroethane	µg/L	5	13.7		12.9				20.1		19.8				24.6		24.9				26							
1,2-Dichloropropane	µg/L	5	< 0.8	U	< 0.8	U			< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U						

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW13																							
		Sample ID	67WW13-050614		67WW13FD-050614		67WW13-140725		67WW13FD-072514		67WW13-072514		67WW13-141204		67WW13FD-120414		67WW13-120414		67WW13-150211		67WW13-021115		67WW13-150325		67WW13-032515		67WW13-150519	
		Sample Date	5/6/2014		5/6/2014		7/25/2014		7/25/2014		7/25/2014		12/4/2014		12/4/2014		12/4/2014		2/11/2015		2/11/2015		3/25/2015		3/25/2015		5/19/2015	
		Sample Purpose	REG		FD		REG		FD		REG		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,3-Dichlorobenzene	µg/L	3,100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
1,3-Dichloropropane	µg/L	29	< 0.8	U	< 0.8	U			< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U						
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
2,2-Dichloropropane	µg/L	42	< 1	UJ	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
2-Butanone	µg/L	61,000	< 10	U	< 10	U			< 5	U	< 5	U			< 25	U	< 25	U			< 12.5	U						
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
2-Hexanone	µg/L	6,100	< 10	U	< 10	U			< 5	U	< 5	U			< 25	U	< 25	U			< 12.5	U						
4-Chlorotoluene	µg/L	2,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Acetone	µg/L	92,000	< 10	U	< 10	U			< 5	U	< 5	U			< 25	U	< 25	U			< 12.5	U						
Benzene	µg/L	5	1.21	J	0.79	J			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
Bromobenzene	µg/L	2,000	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
Bromochloromethane	µg/L	4,100	< 0.8	U	< 0.8	U			< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U						
Bromodichloromethane	µg/L	5	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Bromoform	µg/L	36	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
Bromomethane	µg/L	140	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	UJ						
Carbon disulfide	µg/L	10,000	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
Carbon tetrachloride	µg/L	5	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
Chloroethane	µg/L	41,000	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U			0.55	J	0.57	J			0.848	J	0.813	J			1.32	J						
Chloromethane	µg/L	220	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
cis-1,2-Dichloroethene	µg/L	70	0.755	J	0.684	J			1.15		1.19				1.49	J	1.31	J			1.6	J						
cis-1,3-Dichloropropene	µg/L	5	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Dibromochloromethane	µg/L	34	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Dibromomethane	µg/L	380	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Dichlorodifluoromethane	µg/L	20,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Ethylbenzene	µg/L	700	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Hexachlorobutadiene	µg/L	20	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Isopropylbenzene	µg/L	10,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
m,p-Xylenes	µg/L	10,000	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
Methyl isobutyl ketone	µg/L	8,200	< 10	U	< 10	U			< 5	U	< 5	U			< 25	U	< 25	U			< 12.5	U						
Methylene chloride	µg/L	5	< 1	U	< 1	U			< 0.5	U	< 0.5	U			2.9	J	2.88	J			< 1.25	U						
Naphthalene	µg/L	2,000	< 0.8	U	< 0.8	U			< 0.4	U	< 0.4	U			< 2	U	< 2	U			< 1	U						
n-Butylbenzene	µg/L	4,100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
o-Xylene	µg/L	10,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
p-Isopropyltoluene	µg/L	10,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
sec-Butylbenzene	µg/L	4,100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Styrene	µg/L	100	< 0.5	U	< 0.5	U			< 0.25	U	< 0.25	U			< 1.25	U	< 1.25	U			< 0.626	U						
tert-Butylbenzene	µg/L	4,100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Tetrachloroethene	µg/L	5	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Toluene	µg/L	1,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
trans-1,2-Dichloroethene	µg/L	100	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
trans-1,3-Dichloropropene	µg/L	29	< 2	U	< 2	U			< 1	U	< 1	U			< 5	U	< 5	U			< 2.5	U						
Trichloroethene	µg/L	5	1.25	J	1.27	J			1.71		1.72				1.94	J	1.65	J			2.63							
Trichlorofluoromethane	µg/L	31,000	< 1	U	< 1	U			< 0.5	U	< 0.5	U			< 2.5	U	< 2.5	U			< 1.25	U						
Vinyl chloride	µg/L	2	0.644	J	0.619	J			0.728	J	0.707	J			< 2.5	U	< 2.5	U			0.653	J						

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW13																							
		Sample ID	67WW13-051915		67WW13-151118		67WW13-111815		67WW13-151216		67WW13-161215		67WW13-160519		67WW13-051916		67WW13-112817		67WW13-180501		67WW13-180501FD		67WW13-181023		67WW13-190501-FD		67WW13-190501	
		Sample Date	5/19/2015		11/18/2015		11/18/2015		12/16/2015		12/16/2015		5/19/2016		5/19/2016		11/28/2017		5/1/2018		5/1/2018		10/23/2018		5/1/2019		5/1/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV	1,680												1,660		1,570		1,650		1,520		1,420		1,300		1,240	
Nitrate	mg/L	10	< 2	U											< 2	U	< 0.1	U	0.674		< 0.1	U	< 0.2	U	0.657		0.697	
Nitrite	mg/L	1	3.4	J											< 2	U	< 0.1	U	< 0.1	U	< 0.1	U	< 0.2	U				
Sulfate	mg/L	NV	344												358		390		405		370		355		318		284	
Sulfide	mg/L	NV	< 1	U											< 1	U	1.28		< 1.5	U	< 1.5	U	2.28					
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV	224												71.9		320		340		350		130					
Total Organic Carbon	mg/L	NV	62.4												93.3		3.4		3.07		3.18		3.99		3.24		2.91	
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV															0.3	NV	0.2				0.4	J				
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	5.52		6.27		6.27		5.89		5.89		5.74		5.74		5.73		5.42				5.39				4.83	
Dissolved oxygen	mg/L	NV	1.25		0.28		0.28		0		0		0.55		0.55		0.08		0.6				0.19				2.77	
Ferrous Iron	NA	NV																	0.04	UJ							0.00	
Flow Rate	mL/Min	NV															100		100				100				100	
Measured well depth	Ft BTOC	NV															28.63		28.48				28.75				28.6	
Oxidation Reduction Potential	mV	NV	219		158		158		85		85		244		244		303		337				281				209	
pH	SU	NV	5.95		6.69		6.69		6.49		6.49		5.38		5.38		5.62		5.66				5.78				5.48	
Temperature	C	NV	20.22		20.18		20.18		18.41		18.41		18.85		18.85		20.23		19.80				18.49				21.37	
Total Purge	L	NV															0.65		2.5				3.0				3	
Turbidity	NTU	NV	0		0		0		1		1		0		0		1		1.2				0				0	
Water Level at Reading Time	Ft BTOC	NV															22.16		21.17				22.62				20.4	
GASES																												
Carbon dioxide	µg/L	NV															470,000		870,000		860,000		620,000		860,000		840,000	
Ethane	µg/L	NV	< 2	U											< 2	U	< 0.23	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U	< 0.47	U
Ethylene	µg/L	NV	< 2	U											< 2	U	< 0.22	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U	< 0.55	U
Methane	µg/L	NV	< 2	U											< 2	U	0.32	J	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																					368					
Ferrous Iron	mg/L	NV	< 0.04	U											< 0.04	U							0.035	J				
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26									78.3						36											
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 1	U			< 1	U							< 0.8	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000															< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	5.96				7.66								7		5.1		4.8		4.7		6.1		3.8		3.9	
1,1-Dichloroethane	µg/L	10,000	30.2				46.3								22.5		19	J	15		15		32		13		14	
1,1-Dichloroethene	µg/L	7	522				762								274		320		160		170		570		160		200	
1,1-Dichloropropene	µg/L	3	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.75	U			< 0.75	U							< 0.6	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichloropropane	µg/L	0.04	< 2.5	U			< 2.5	U							< 2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 1	U			< 1	U							< 0.8	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 5	U			< 5	U							< 4	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dibromoethane	µg/L	0.1	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	30.6				42.6								35.7		32		27		28		43		23		24	
1,2-Dichloropropane	µg/L	5	< 1	U			< 1	U							< 0.8	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW13																							
		Sample ID	67WW13-051915		67WW13-151118		67WW13-111815		67WW13-151216		67WW13-161215		67WW13-160519		67WW13-051916		67WW13-112817		67WW13-180501		67WW13-180501FD		67WW13-181023		67WW13-190501-FD		67WW13-190501	
		Sample Date	5/19/2015		11/18/2015		11/18/2015		12/16/2015		12/16/2015		5/19/2016		5/19/2016		11/28/2017		5/1/2018		5/1/2018		10/23/2018		5/1/2019		5/1/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29	< 1	U			< 1	U							< 0.8	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000	< 12.5	U			< 12.5	U							< 10	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000	< 0.626	UJ			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100	< 12.5	U			< 12.5	U							< 10	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000	< 12.5	U			< 12.5	U							< 10	U	< 2	U	< 1	U	< 1	U	< 2	U	< 1	U	< 1	U
Benzene	µg/L	5	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100	< 1	U			< 1	U							< 0.8	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36	< 2.5	U			< 2.5	U							< 2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140	< 2.5	U			< 2.5	U							< 2	U	< 1	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000	< 2.5	U			< 2.5	U							< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000	< 2.5	U			< 2.5	U							< 2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000	1.7	J			2.27	J							1.36	J	< 1	U	0.76	J	0.78	J	1.4		< 0.5	U	< 0.5	U
Chloromethane	µg/L	220	< 2.5	U			< 2.5	U							< 2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	2.08	J			2.75								1.55	J	< 1	U	0.99	J	1		1.9		0.81	J	0.94	J
cis-1,3-Dichloropropene	µg/L	5	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U
Ethylbenzene	µg/L	700	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20	< 1.25	U			< 1.25	U							< 1	UJ	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000	< 2.5	U			< 2.5	U							< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 12.5	U			< 12.5	U							< 10	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Methylene chloride	µg/L	5	< 1.25	U			< 1.25	U							< 1	U	< 2	UJ	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000	< 1	U			< 1	U							< 0.8	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Butylbenzene	µg/L	4,100	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100	< 0.626	U			< 0.626	U							< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 1.25	U			< 1.25	U							< 1	U	< 1	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 2.5	U			< 2.5	U							< 2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	2.91				3.32								1.67	J	< 1	U	< 0.5	U	< 0.5	U	2.4		1		1.1	
Trichlorofluoromethane	µg/L	31,000	< 1.25	U			< 1.25	U							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	0.695	J			1.65	J							< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW13										67WW14													
		Sample ID	67WW13-191028		67WW13-201103		67WW13-211111		67WW13-211111-FD		67WW13-221109		67WW14-131001		67WW14-100113		67WW14-100113-FD		67WW14-140124		67WW14-012414		67WW14-140507		67WW14-050714		67WW14-140725	
		Sample Date	10/28/2019		11/3/2020		11/11/2021		11/11/2021		11/9/2022		10/1/2013		10/1/2013		10/1/2013		1/24/2014		1/24/2014		5/7/2014		5/7/2014		7/25/2014	
		Sample Purpose	REG		REG		REG		FD		REG		REG		REG		FD		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV	1,280		1,270		1,200		1,210		1460															
Nitrate	mg/L	10	< 0.2	U	< 0.2	U	0.32	J	0.31	J	0.114	J														
Nitrite	mg/L	1																								
Sulfate	mg/L	NV	304		346		268		261		348															
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV	1.69		1.45	J	4		4.61		2.92															
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	4.87		4.97		4.83				4.95		1.55		1.55				1.53		1.53		1.68		1.68		1.66	
Dissolved oxygen	mg/L	NV	0.8		1.28		0.67				0.69		1.34		1.34				0.67		0.67		1.17		1.17		0.12	
Ferrous Iron	NA	NV	0.06		0.9		0.00				0.13															
Flow Rate	mL/Min	NV	100		100																					
Measured well depth	Ft BTOC	NV	28.58																							
Oxidation Reduction Potential	mV	NV	185		205		196				103		-60		-60				-37		-37		-5		-5		210	
pH	SU	NV	6.26		6.07		6.07				6.4		6.47		6.47				6.52		6.52		5.67		5.67		5.34	
Temperature	C	NV	19.38		15.93		18.03				20.36		22.78		22.78				18.42		18.42		19.86		19.86		25.56	
Total Purge	L	NV	3		3.0																					
Turbidity	NTU	NV	0		0		1.2				0		3.6		3.6				15.5		15.5		24.8		24.8		17.3	
Water Level at Reading Time	Ft BTOC	NV	21.21		20.14																					
GASES																										
Carbon dioxide	µg/L	NV	140,000		350,000						80000	J														
Ethane	µg/L	NV	< 0.47	U	< 0.47	U	0.794	J	0.293	J	< 0.5	U														
Ethylene	µg/L	NV	< 0.55	U	< 0.55	U	1.02	J	< 0.5	UJ	< 0.5	UJ														
Methane	µg/L	NV	< 1	U	< 1	U	2.29		1.72		< 0.5	UJ														
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26																								
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U		
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U																
1,1,2-Trichloroethane	µg/L	5	5		5.7		< 1	UJ	5.9	J	4.3				< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,1-Dichloroethane	µg/L	10,000	31		33		< 0.5	UJ	32	J	25				0.197	J	0.304	J			0.275	J			0.538	J		
1,1-Dichloroethene	µg/L	7	640		720		< 0.5	UJ	410	J	480				1.82	J	2.22				2.58				4.27			
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	UJ	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.3	U	< 0.3	U			< 0.3	U			< 0.3	U		
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 1	U			< 1	U			< 1	U		
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U		
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.2	U			< 2	UJ	< 2	UJ			< 2	U			< 2	U		
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
1,2-Dichloroethane	µg/L	5	36		44		< 0.5	UJ	43	J	34				0.692	J	0.849	J			0.666	J			0.897	J		
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U		

Table 2-4
Groundwater Results, 2013–2022

	Location Code	67WW13										67WW14													
	Sample ID	67WW13-191028		67WW13-201103		67WW13-211111		67WW13-211111-FD		67WW13-221109		67WW14-131001		67WW14-100113		67WW14-100113-FD		67WW14-140124		67WW14-012414		67WW14-140507		67WW14-050714		67WW14-140725	
	Sample Date	10/28/2019		11/3/2020		11/11/2021		11/11/2021		11/9/2022		10/1/2013		10/1/2013		10/1/2013		1/24/2014		1/24/2014		5/7/2014		5/7/2014		7/25/2014	
	Sample Purpose	REG		REG		REG		FD		REG		REG		REG		FD		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U		
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.5	UJ	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			9.06	J	7.47	J			< 5	U			< 5	U		
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
2-Hexanone	µg/L	6,100	< 1	U	< 2	U	< 2	U	< 2	U	< 1	U			< 5	U	< 5	U			< 5	U			< 5	U		
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Acetone	µg/L	92,000	< 1	U	< 1	U	< 2	U	< 2	U	< 0.4	U			3.27	J	2.59	J			< 5	U			< 5	U		
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	B		
Bromobenzene	µg/L	2,000	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U		
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Bromoform	µg/L	36	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 1	U			< 1	U		
Bromomethane	µg/L	140	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 1	U	< 1	U			< 1	U			< 1	U		
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U	< 2	U	< 2	U	< 0.6	U			< 1	U	< 1	U			< 1	U			< 1	U		
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
Chloroethane	µg/L	41,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 1	U	< 1	U			< 1	U			< 1	U		
Chloroform	µg/L	1,000	0.66	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			0.64	J	< 1	U			< 1	U			< 1	U		
cis-1,2-Dichloroethene	µg/L	70	1.8		1.6		< 0.5	UJ	1.6	J	1.2				< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Hexachlorobutadiene	µg/L	20	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	UJ			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 1	U			< 1	U			< 1	U		
Methyl isobutyl ketone	µg/L	8,200	< 1	U	< 2	U	< 2	U	< 2	U	< 0.7	U			< 5	U	< 5	U			< 5	U			< 5	U		
Methylene chloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Naphthalene	µg/L	2,000	< 0.5	UJ	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U		
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	UJ			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	UJ			0.431	J	0.353	J			< 0.5	U			< 0.5	U		
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	UJ			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Styrene	µg/L	100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U		
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	UJ			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U			< 1	U			< 1	U		
Trichloroethene	µg/L	5	2.6		3.1		< 0.5	UJ	2.4	J	2.1	J			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		
Vinyl chloride	µg/L	2	0.82	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U		

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW14																							
		Sample ID	67WW14-072514		67WW14-141203		67WW14-120314		67WW14-150210		67WW14-021015		67WW14FD-021015		67WW14-150512		67WW14-051215		67WW14FD-051215		67WW14-151118		67WW14-111815		67WW14-160518		67WW14-051816	
		Sample Date	7/25/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		2/10/2015		5/12/2015		5/12/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		5/18/2016	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		FD		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																										
Chloride	mg/L	NV																								
Nitrate	mg/L	10																								
Nitrite	mg/L	1																								
Sulfate	mg/L	NV																								
Sulfide	mg/L	NV																								
TOTAL ORGANIC CARBON																										
Total Inorganic Carbon	mg/L	NV																								
Total Organic Carbon	mg/L	NV																								
DHC																										
BVC	cells/mL	NV																								
Dehalococcoides	cells/mL	NV																								
FIELD TESTS																										
Specific conductivity	µmhos/cm	NV	1.66		1.52		1.52		1.51		1.51				1.47		1.47				2.25		2.25		0.021		0.021	
Dissolved oxygen	mg/L	NV	0.12		0		0		0.63		0.63				0.68		0.68				0.52		0.52		1.04		1.04	
Ferrous Iron	NA	NV																								
Flow Rate	mL/Min	NV																								
Measured well depth	Ft BTOC	NV																								
Oxidation Reduction Potential	mV	NV	210		-8		-8		-13		-13				158		158				136		136		252		252	
pH	SU	NV	5.34		6.34		6.34		6.79		6.79				5.57		5.57				6.58		6.58		5.36		5.36	
Temperature	C	NV	25.56		20.74		20.74		15.24		15.24				20.48		20.48				21.67		21.67		19.84		19.84	
Total Purge	L	NV																								
Turbidity	NTU	NV	17.3		8.1		8.1		7		7				161		161				6.5		6.5		172		172	
Water Level at Reading Time	Ft BTOC	NV																								
GASES																										
Carbon dioxide	µg/L	NV																								
Ethane	µg/L	NV																								
Ethylene	µg/L	NV																								
Methane	µg/L	NV																								
GENERAL CHEMISTRY																										
Alkalinity	mg/L	NV																								
Ferrous Iron	mg/L	NV																								
SEMIVOLATILES																										
1,4-Dioxane	µg/L	26																								
VOLATILES																										
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000																								
1,1,2-Trichloroethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,1-Dichloroethane	µg/L	10,000	0.58	J			0.451	J			0.434	J	0.369	J			0.418	J	0.427	J			3.7				2.15	
1,1-Dichloroethene	µg/L	7	3.57				4.73				3.46		3.61				2.77		2.93				26.3				10.8	
1,1-Dichloropropene	µg/L	3	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.3	U			< 0.3	U			< 0.3	U	< 0.3	U			< 0.3	U	< 0.3	U			< 0.3	U			< 0.3	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 2	U			< 2	U			< 2	U	< 2	U			< 2	U	< 2	U			< 2	U			< 2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
1,2-Dichloroethane	µg/L	5	1.31				0.79	J			0.64	J	0.657	J			0.799	J	0.815	J			5.83				3.54	
1,2-Dichloropropane	µg/L	5	< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW14																							
		Sample ID	67WW14-072514		67WW14-141203		67WW14-120314		67WW14-150210		67WW14-021015		67WW14FD-021015		67WW14-150512		67WW14-051215		67WW14FD-051215		67WW14-151118		67WW14-111815		67WW14-160518		67WW14-051816	
		Sample Date	7/25/2014		12/3/2014		12/3/2014		2/10/2015		2/10/2015		2/10/2015		5/12/2015		5/12/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		5/18/2016	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		FD		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
1,3-Dichloropropane	µg/L	29	< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
1,4-Dichlorobenzene	µg/L	75	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
2,2-Dichloropropane	µg/L	42	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
2-Butanone	µg/L	61,000	< 5	U			< 5	U			< 5	U	< 5	U			< 5	U	< 5	U			< 5	U			< 5	U
2-Chlorotoluene	µg/L	2,000	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
2-Hexanone	µg/L	6,100	< 5	U			< 5	U			< 5	U	< 5	U			< 5	UJ	< 5	UJ			< 5	U			< 5	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Acetone	µg/L	92,000	< 5	U			< 5	U			< 5	U	< 5	U			4	J	< 5	U			< 5	U			< 5	U
Benzene	µg/L	5	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Bromobenzene	µg/L	2,000	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Bromochloromethane	µg/L	4,100	< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
Bromodichloromethane	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Bromoform	µg/L	36	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Bromomethane	µg/L	140	< 1	U			< 1	U			< 1	U	< 1	UJ			< 1	U	< 1	U			< 1	U			< 1	UJ
Carbon disulfide	µg/L	10,000	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Chlorobenzene	µg/L	100	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Chloroethane	µg/L	41,000	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Chloroform	µg/L	1,000	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
Chloromethane	µg/L	220	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Hexachlorobutadiene	µg/L	20	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Isopropylbenzene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 5	U			< 5	U			< 5	U	< 5	U			< 5	U	< 5	U			< 5	U			< 5	U
Methylene chloride	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Naphthalene	µg/L	2,000	< 0.4	U			< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U	< 0.4	U			< 0.4	U			< 0.4	U
n-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
n-Propylbenzene	µg/L	4,100	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
o-Xylene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Styrene	µg/L	100	< 0.25	U			< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U	< 0.25	U			< 0.25	U			< 0.25	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Toluene	µg/L	1,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U			< 1	U			< 1	U	< 1	U			< 1	U	< 1	U			< 1	U			< 1	U
Trichloroethene	µg/L	5	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U			< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U			< 0.5	U			< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U			0.297	J			< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW14																67WW15									
		Sample ID	67WW14-112717		67WW14-180502		67WW14-181022		67WW14-190502		67WW14-191024		67WW14-201102		67WW14-211110		67WW14-221107		67WW15-160519		67WW15-051916		67WW15-112717		67WW15-180502		67WW15-181023	
		Sample Date	11/27/2017		5/2/2018		10/22/2018		5/2/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022		5/19/2016		5/19/2016		11/27/2017		5/2/2018		10/23/2018	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	2.09		1.66		2.09		2.17		2.31		2.64		1.82		1.87		2.45		2.45		1.52		1.44		1.8	
Dissolved oxygen	mg/L	NV	1.17		0		0.66		0.27		0.15		0.25		0.58		0.03		1.5		1.5		2.2		0		0.16	
Ferrous Iron	NA	NV															0.51											
Flow Rate	mL/Min	NV	100		100		100		100		100		100										100		100		100	
Measured well depth	Ft BTOC	NV	30.58		30.55		30.47		30.62		30.52												47.4		47.35		47.59	
Oxidation Reduction Potential	mV	NV	250		372		274		228		-44		47		28		83		228		228		321		395		253	
pH	SU	NV	5.85		5.73		5.76		5.89		6.19		5.60		6.09		5.65		5.58		5.58		5.28		5.28		5.61	
Temperature	C	NV	19.19		21.65		21.68		20.83		17.99		16.43		15.58		21.54		18.7		18.7		18.3		19.54		18.06	
Total Purge	L	NV	0.91		2.5		3.0		3		3		3.0										0.65		3		3.0	
Turbidity	NTU	NV	20.7		7.2		0		30.6		3.7		0		9		0		6.8		6.8		40.3		14.2		2.1	
Water Level at Reading Time	Ft BTOC	NV	20.75		19.98		21.08		19.02		19.62		18.81										23.96		23.21		24.44	
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26	17																				12					
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 8	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U					< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			22.7		5.6		5.6		6	
1,1-Dichloroethane	µg/L	10,000	< 1	U	< 0.5	U	1.3		1.4		1.8		1.2		0.89	J	< 0.2	U			46		11		10		13	
1,1-Dichloroethene	µg/L	7	5.6		4.2		6.6		5.3		7.4		4.9		3		1.2				2,460		510		380		670	
1,1-Dichloropropene	µg/L	3	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.3	U	< 1	U	< 0.5	U	< 0.5	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 20	U	< 1	U	< 0.5	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U			52.6	J	< 1	U	< 0.5	U	< 1	U
1,2-Dibromoethane	µg/L	0.1	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	3.1		1.9		2.5		1.8		1.5		< 0.5	U	0.58	J	< 0.2	U			117		27		26		30	
1,2-Dichloropropane	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

Location Code			67WW14																67WW15									
Sample ID			67WW14-112717		67WW14-180502		67WW14-181022		67WW14-190502		67WW14-191024		67WW14-201102		67WW14-211110		67WW14-221107		67WW15-160519		67WW15-051916		67WW15-112717		67WW15-180502		67WW15-181023	
Sample Date			11/27/2017		5/2/2018		10/22/2018		5/2/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022		5/19/2016		5/19/2016		11/27/2017		5/2/2018		10/23/2018	
Sample Purpose			REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,3-Dichloropropane	µg/L	29	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
2,2-Dichloropropane	µg/L	42	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 100	U	< 2	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U			< 100	U	< 2	U	< 1	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
Acetone	µg/L	92,000	< 2	U	< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U			< 100	U	< 2	U	< 1	U	< 2	U
Benzene	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
Bromochloromethane	µg/L	4,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 8	U	< 1	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 20	U	< 1	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U			< 20	U	< 2	U	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 20	U	< 1	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			6.1	J	1.5		1.3		1.7	
cis-1,3-Dichloropropene	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	UJ
Ethylbenzene	µg/L	700	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U			< 0.5	UJ	< 1	U	< 0.5	U	< 1	U
Isopropylbenzene	µg/L	10,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 2	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U			< 100	U	< 2	U	< 1	U	< 1	U
Methylene chloride	µg/L	5	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 2	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			36.7		< 1	U	< 0.5	U	< 0.5	U
n-Butylbenzene	µg/L	4,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
n-Propylbenzene	µg/L	4,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 5	U	< 1	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 10	U	< 1	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			5.48	J	< 1	U	1.2		1.4	
Trichlorofluoromethane	µg/L	31,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			1.07		< 1	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW15										67WW16				67WW16I											
		Sample ID	67WW15-190503		67WW15-191024		67WW15-201103		67WW15-211111		67WW15-221108		67WW16-160518		67WW16-051816		67WW16I-112917		67WW16I-180503		67WW16I-181025		67WW16I-190501		67WW16I-191024		67WW16I-201103	
		Sample Date	5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		5/18/2016		5/18/2016		11/29/2017		5/3/2018		10/25/2018		5/1/2019		10/24/2019		11/3/2020	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	1.93		1.80		1.90		1.89		1.96		1.53		1.53		1.43		0.982		1.53		1.50		1.32		1.43	
Dissolved oxygen	mg/L	NV	2.85		0.03		0.56		0.69		0.27		0.37		0.37		0.41		0		0.14		1.63		0.06		0.14	
Ferrous Iron	NA	NV									0.06																	
Flow Rate	mL/Min	NV	100		100		100										100		100		100		100		100		100	
Measured well depth	Ft BTOC	NV	47.43		47.3												80.38		80.23		80.49		80.38		80.42			
Oxidation Reduction Potential	mV	NV	231		230		224		263		286		94		94		-2		84		41		18		-53		1	
pH	SU	NV	5.43		5.69		5.37		5.43		5.93		4.99		4.99		6.26		6.20		6.24		5.35		5.88		6.41	
Temperature	C	NV	20.33		21.62		16.91		19.31		19.85		18.98		18.98		19.76		19.31		17.69		22.48		21.45		18.41	
Total Purge	L	NV	3		3.5		3										0.78		2.5		3		3.0		3.0		3.0	
Turbidity	NTU	NV	0		0		0		4.4		0		8.7		8.7		6.3		4.2		7.6		1.9		5.8		1.5	
Water Level at Reading Time	Ft BTOC	NV	22.23		22.95		21.92										25		22.83		24.22		21.98		22.87		21.84	
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26															0.33											
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U					< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,1,2-Trichloroethane	µg/L	5	5.4		6.4		6.4		5.7		3.2				< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethane	µg/L	10,000	9.2		13		14		31		9.9				< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	330		640	J	730		420		640				< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloropropene	µg/L	3	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5	U	< 0.5	UJ	< 1	U	< 1	U	< 0.4	U			< 0.3	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	UJ	< 1	U
1,2,3-Trichloropropane	µg/L	0.04	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U			< 2	U	< 1	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichlorobenzene	µg/L	600	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,2-Dichloroethane	µg/L	5	22		27		29		43		24				< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloropropane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

Location Code			67WW15										67WW16				67WW16I											
Sample ID			67WW15-190503		67WW15-191024		67WW15-201103		67WW15-211111		67WW15-221108		67WW16-160518		67WW16-051816		67WW16I-112917		67WW16I-180503		67WW16I-181025		67WW16I-190501		67WW16I-191024		67WW16I-201103	
Sample Date			5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		5/18/2016		5/18/2016		11/29/2017		5/3/2018		10/25/2018		5/1/2019		10/24/2019		11/3/2020	
Sample Purpose			REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,3-Dichloropropane	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,4-Dichlorobenzene	µg/L	75	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
2,2-Dichloropropane	µg/L	42	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Butanone	µg/L	61,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
2-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
2-Hexanone	µg/L	6,100	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U
4-Chlorotoluene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
Acetone	µg/L	92,000	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U			< 5	U	< 2	U	< 1	U	< 2	U	3.3		< 1	U	< 1	U
Benzene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromobenzene	µg/L	2,000	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromoform	µg/L	36	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Bromomethane	µg/L	140	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Carbon disulfide	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U			< 1	U	< 2	U	< 1	U	< 1	U	0.9	J	< 1	U	< 1	U
Carbon tetrachloride	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chlorobenzene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroethane	µg/L	41,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloroform	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Chloromethane	µg/L	220	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,2-Dichloroethene	µg/L	70	1.3		1.7		1.7		1.6		1				< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromochloromethane	µg/L	34	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dibromomethane	µg/L	380	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Dichlorodifluoromethane	µg/L	20,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Ethylbenzene	µg/L	700	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Hexachlorobutadiene	µg/L	20	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U			< 0.5	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 1	U
Isopropylbenzene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
m,p-Xylenes	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U			< 1	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Methyl isobutyl ketone	µg/L	8,200	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U			< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 2	U
Methylene chloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 2	U	3.3				< 0.5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
Naphthalene	µg/L	2,000	< 0.5	U	< 0.5	UJ	< 0.5	U	< 1	U	< 0.3	U			< 0.4	U	< 1	U	< 0.5	U	< 0.5	UJ	< 0.5	U	< 0.5	UJ	< 0.5	U
n-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
n-Propylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
o-Xylene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
p-Isopropyltoluene	µg/L	10,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
sec-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Styrene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.25	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
tert-Butylbenzene	µg/L	4,100	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Tetrachloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Toluene	µg/L	1,000	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	1.1		1.5		2		2.2		1.4				< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichlorofluoromethane	µg/L	31,000	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U			< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW16I						67WW17										67WW18									
		Sample ID	67WW16I-211111		67WW16I-221108		67WW16I-221108-FD		67WW17-191024		67WW17-201102		67WW17-201102-FD		67WW17-211110		67WW17-221107		67WW18-191024		67WW18-191024-FD		67WW18-201102		67WW18-211110		67WW18-221107	
		Sample Date	11/11/2021		11/8/2022		11/8/2022		10/24/2019		11/2/2020		11/2/2020		11/10/2021		11/7/2022		10/24/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022	
		Sample Purpose	REG		REG		FD		REG		REG		FD		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
ANIONS																												
Chloride	mg/L	NV																										
Nitrate	mg/L	10																										
Nitrite	mg/L	1																										
Sulfate	mg/L	NV																										
Sulfide	mg/L	NV																										
TOTAL ORGANIC CARBON																												
Total Inorganic Carbon	mg/L	NV																										
Total Organic Carbon	mg/L	NV																										
DHC																												
BVC	cells/mL	NV																										
Dehalococcoides	cells/mL	NV																										
FIELD TESTS																												
Specific conductivity	µmhos/cm	NV	1.27		1.43				2.36		3.15				3.29		3.22		0.974				1.14		1.1		1.27	
Dissolved oxygen	mg/L	NV	0.77		0.16				0.95		0.76				0.25		0.52		1.54				0.36		0.63		0.27	
Ferrous Iron	NA	NV			3.86												0.09										0.04	
Flow Rate	mL/Min	NV							100		100								100				100					
Measured well depth	Ft BTOC	NV							29.04										43.58									
Oxidation Reduction Potential	mV	NV	92		-27				87		96				184		87		125				63		174		82	
pH	SU	NV	5.61		5.89				6.65		5.76				5.94		6.46		6.52				5.92		5.73		6.38	
Temperature	C	NV	17.81		19.57				20.4		18.46				18.72		21.29		20.26				19.07		18.79		22	
Total Purge	L	NV							3.0		3.0								3.5				3.0					
Turbidity	NTU	NV	33.7		23.3				0		0				28.4		0		8.1				0		4.4		0	
Water Level at Reading Time	Ft BTOC	NV							23.88		22.72								23.81				21.71					
GASES																												
Carbon dioxide	µg/L	NV																										
Ethane	µg/L	NV																										
Ethylene	µg/L	NV																										
Methane	µg/L	NV																										
GENERAL CHEMISTRY																												
Alkalinity	mg/L	NV																										
Ferrous Iron	mg/L	NV																										
SEMIVOLATILES																												
1,4-Dioxane	µg/L	26																										
VOLATILES																												
1,1,1,2-Tetrachloroethane	µg/L	110	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1,2,2-Tetrachloroethane	µg/L	14	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	3,100,000	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,1-Dichloroethane	µg/L	10,000	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1-Dichloropropene	µg/L	3	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,2,3-Trichlorobenzene	µg/L	310	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
1,2,3-Trichloropropane	µg/L	0.04	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2,4-Trichlorobenzene	µg/L	70	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2,4-Trimethylbenzene	µg/L	5,100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 1	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.2	U
1,2-Dibromoethane	µg/L	0.1	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,2-Dichlorobenzene	µg/L	600	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,2-Dichloropropane	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U

Table 2-4
Groundwater Results, 2013–2022

		Location Code	67WW16I						67WW17										67WW18									
		Sample ID	67WW16I-211111		67WW16I-221108		67WW16I-221108-FD		67WW17-191024		67WW17-201102		67WW17-201102-FD		67WW17-211110		67WW17-221107		67WW18-191024		67WW18-191024-FD		67WW18-201102		67WW18-211110		67WW18-221107	
		Sample Date	11/11/2021		11/8/2022		11/8/2022		10/24/2019		11/2/2020		11/2/2020		11/10/2021		11/7/2022		10/24/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022	
		Sample Purpose	REG		REG		FD		REG		REG		FD		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,3,5-Trimethylbenzene	µg/L	5,100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,3-Dichlorobenzene	µg/L	3,100	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
1,3-Dichloropropane	µg/L	29	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,4-Dichlorobenzene	µg/L	75	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
2,2-Dichloropropane	µg/L	42	< 0.5	UJ	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
2-Butanone	µg/L	61,000	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U
2-Chlorotoluene	µg/L	2,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
2-Hexanone	µg/L	6,100	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 2	U	< 2	U	< 1	U
4-Chlorotoluene	µg/L	2,000	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
Acetone	µg/L	92,000	< 2	U	< 0.4	U	< 0.4	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U
Benzene	µg/L	5	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromobenzene	µg/L	2,000	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
Bromochloromethane	µg/L	4,100	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromodichloromethane	µg/L	5	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Bromoform	µg/L	36	< 1	U	< 0.4	U	< 0.4	U	2.3		< 0.5	U	< 0.5	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U
Bromomethane	µg/L	140	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.4	U
Carbon disulfide	µg/L	10,000	< 2	U	< 0.6	U	< 0.6	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.6	U
Carbon tetrachloride	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U
Chlorobenzene	µg/L	100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Chloroethane	µg/L	41,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Chloroform	µg/L	1,000	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Chloromethane	µg/L	220	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
cis-1,2-Dichloroethene	µg/L	70	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
cis-1,3-Dichloropropene	µg/L	5	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Dibromochloromethane	µg/L	34	< 1	U	< 0.3	U	< 0.3	U	2.2		< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Dibromomethane	µg/L	380	< 0.5	U	< 0.2	U	< 0.2	U	0.72	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Dichlorodifluoromethane	µg/L	20,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Ethylbenzene	µg/L	700	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Hexachlorobutadiene	µg/L	20	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	10,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
m,p-Xylenes	µg/L	10,000	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U
Methyl isobutyl ketone	µg/L	8,200	< 2	U	< 0.7	U	< 0.7	U	< 1	U	< 2	U	< 2	U	< 2	U	< 0.7	U	< 1	U	< 1	U	< 2	U	< 2	U	< 0.7	U
Methylene chloride	µg/L	5	< 1	U	< 0.4	U	< 0.4	U	< 1	U	< 1	U	< 1	U	< 2	U	< 0.4	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.4	U
Naphthalene	µg/L	2,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
n-Butylbenzene	µg/L	4,100	< 1	U	< 0.4	U	< 0.4	U	< 0.5	U	< 1	U	< 1	U	< 1	U	< 0.4	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.4	U
n-Propylbenzene	µg/L	4,100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
o-Xylene	µg/L	10,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
p-Isopropyltoluene	µg/L	10,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
sec-Butylbenzene	µg/L	4,100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Styrene	µg/L	100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
tert-Butylbenzene	µg/L	4,100	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Tetrachloroethene	µg/L	5	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Toluene	µg/L	1,000	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
trans-1,2-Dichloroethene	µg/L	100	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
trans-1,3-Dichloropropene	µg/L	29	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Trichlorofluoromethane	µg/L	31,000	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
Vinyl chloride	µg/L	2	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U

Table 2-4
Groundwater Results, 2013–2022

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

°C - degrees Celsius

µg/L - micrograms per liter

µmhos/cm - micromhos per centimeter

µS/cm - microsiemens per centimeter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

cells/mL - cells per milliliter

CEQ/mL - cell equivalence per milliliter

FD - field duplicate

Ft BTOC - feet below top of casting

GW-Ind - groundwater medium-specific concentration for industrial use

ID - identifier

MCL - maximum contaminant level

mg/L - milligrams per liter

mL/Min - milliliters per minute

mS/cm - millisiemens per centimeter

mV - millivolts

NTU - nephelometric turbidity unit

NV - no value established

REG - regular sample

SU - standard unit

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW01																					
		Sample ID	67WW01-981208		67WW01-040912		67WW01-060806		67WW01-061218		67WW01-053113		67WW01-050714		67WW01-072514		67WW01-120314		67WW01-021015		67WW01-051915		67WW01-111915		67WW01-032916	
		Sample Date	12/8/1998		9/12/2004		8/6/2006		12/18/2006		5/31/2013		5/7/2014		7/25/2014		12/3/2014		2/10/2015		5/19/2015		11/19/2015		3/29/2016	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	**560**		< 5	U	< 5	U	< 5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1.25	U	< 1.25	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	**33**		1	J	0.305	JH	0.28	J	< 1	U	< 0.5	U	0.29	J	0.483	J	1.44		1.72	J	2.14	J	2.67	
1,1-Dichloroethene	µg/L	7	**380**		**280**		**153**		**179**		**139**		**257**		**224**		**349**		**544**		**631**		**694**		**728**	
1,2-Dichloroethane	µg/L	5	**27**		**13**		**5.57**	JH	**6.37**		**6.68**		**12.2**		**10.7**		**16.6**		**28.7**		**31.4**		**38.6**		**52.6**	
Trichloroethene	µg/L	5	**6.3**		**6**		**5.38**	JH	**5.99**		2.96		3		2.3		3.36		4.07		3.03		2.84		4	

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW01																67WW02							
		Sample ID	67WW01-051916		67WW01-112817		67WW01-180503		67WW01-190503		67WW01-191024		67WW01-201103		67WW01-211111		67WW01-221108		67WW02-981208		67WW02-981208FD		67WW02-040912		67WW02-060806	
		Sample Date	5/19/2016		11/28/2017		5/3/2018		5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		12/8/1998		12/8/1998		9/12/2004		8/6/2006	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 2.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	100		100		< 5	U	< 5	U
1,1,2-Trichloroethane	µg/L	5	1.62	J	< 1	U	1.2		1.4		0.53	J	< 0.5	U	< 1	U	< 0.3	U	6.4		5.9	J	< 5	U	< 5	U
1,1-Dichloroethene	µg/L	7	714		250		450		280		70		49		23		36		2.4		< 10	U	< 5	U	< 5	U
1,2-Dichloroethane	µg/L	5	43.3		28		22		21		7.6		6.1		3		3.6		< 1	U	< 10	U	< 5	U	< 5	U
Trichloroethene	µg/L	5	3.28	J	2.1		1.7		1.3		0.53	J	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 10	U	< 5	U	< 5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

Location Code			67WW02																						
Sample ID			67WW02-061218		67WW02-053113		67WW02-092713		67WW02-012314		67WW02-050614		67WW02-072414		67WW02-120314		67WW02-021015		67WW02-051215		67WW02FD-051215		67WW02-111915		67WW02-051916	
Sample Date			12/18/2006		5/31/2013		9/27/2013		1/23/2014		5/6/2014		7/24/2014		12/3/2014		2/10/2015		5/12/2015		5/12/2015		11/19/2015		5/19/2016	
Sample Purpose			REG		REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 5	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	3.59		**13.2**		**13**		0.857	J	**67.6**	
1,2-Dichloroethane	µg/L	5	< 5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.377	J
Trichloroethene	µg/L	5	< 5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW02																				67WW03			
		Sample ID	67WW02FD-051916		67WW02-112817		67WW02-180503		67WW02-180503FD		67WW02-181025		67WW02-190501		67WW02-191024		67WW02-201102		67WW02-211110		67WW02-221107		67WW03-981208		67WW03-040912	
		Sample Date	5/19/2016		11/28/2017		5/3/2018		5/3/2018		10/25/2018		5/1/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022		12/8/1998		9/12/2004	
		Sample Purpose	FD		REG		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	1800		< 5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	1.2		< 0.5	U	1		0.6	J	< 0.3	U	24		< 5	U
1,1-Dichloroethene	µg/L	7	66.3		< 1	U	190		190		6.9		180		34		220		100		100		36		< 5	U
1,2-Dichloroethane	µg/L	5	0.321	J	< 1	U	2		1.9		< 0.5	U	4.7		< 0.5	U	5.5		3.2		< 0.2	U	< 20	U	< 5	U
Trichloroethene	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	0.87	J	< 0.5	U	0.83	J	< 0.5	U	< 0.2	U	< 20	U	< 5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW03										67WW04				67WW05									
		Sample ID	67WW03-060809		67WW03-061218		67WW03-051215		67WW03-032916		67WW03-051916		67WW04-001219		67WW04-040912		67WW05-001219		67WW05-040912		67WW05-060808		67WW05-061217		67WW05-053113	
		Sample Date	8/9/2006		12/18/2006		5/12/2015		3/29/2016		5/19/2016		12/19/2000		9/12/2004		12/19/2000		9/12/2004		8/8/2006		12/17/2006		5/31/2013	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.1	U	< 5	U	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U
1,1,2-Trichloroethane	µg/L	5	< 5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.1	U	< 5	U	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U
1,1-Dichloroethene	µg/L	7	< 5	U	< 5	U	< 1	U	< 1	U	< 1	U	< 0.2	U	< 5	U	< 0.2	U	< 5	U	< 5	U	< 5	U	< 2	U
1,2-Dichloroethane	µg/L	5	< 5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.1	U	< 5	U	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U
Trichloroethene	µg/L	5	< 5	U	< 5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.1	U	1	J	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW05																					
		Sample ID	67WW05-092813		67WW05-012314		67WW05-050614		67WW05-072414		67WW05-120314		67WW05-021015		67WW05-051215		67WW05-111915		67WW05-051916		67WW05-112817		67WW05-180503		67WW05-181025	
		Sample Date	9/28/2013		1/23/2014		5/6/2014		7/24/2014		12/3/2014		2/10/2015		5/12/2015		11/19/2015		5/19/2016		11/28/2017		5/3/2018		10/25/2018	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW05														67WW06									
		Sample ID	67WW05-181025-FD		67WW05-190502		67WW05-191024		67WW05-201102		67WW05-211110-FD		67WW05-211110		67WW05-221107		67WW06-001219		67WW06-001219-FD		67WW06-040912		67WW06-060808		67WW06-061218	
		Sample Date	10/25/2018		5/2/2019		10/24/2019		11/2/2020		11/10/2021		11/10/2021		11/7/2022		12/19/2000		12/19/2000		9/12/2004		8/8/2006		12/18/2006	
		Sample Purpose	FD		REG		REG		REG		FD		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.1	U	< 0.1	U	< 5	U	< 5	U	< 5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.3	U	< 0.1	U	< 0.1	U	< 5	U	< 5	U	< 5	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	0.62	J	< 0.5	U	< 0.2	U	< 0.2	U	< 0.2	U	< 5	U	< 5	U	< 5	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	3.51		3.5		< 5	U	3.02	J	1.62	J
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	0.14	J	0.15	J	< 5	U	< 5	U	< 5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW06												67WW07									
		Sample ID	67WW06-100806		67WW06-053113		67WW06-053113-FD		67WW06-092813		67WW06-012414		67WW06-112917		67WW07-001219		67WW07-040912		67WW07-060808		67WW07-061218		67WW07-053113		67WW07-092713	
		Sample Date	8/6/2010		5/31/2013		5/31/2013		9/28/2013		1/24/2014		11/29/2017		12/19/2000		9/12/2004		8/8/2006		12/18/2006		5/31/2013		9/27/2013	
		Sample Purpose	REG		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 2	U	< 2	U	< 1	U	0.752	J	< 1	U	< 0.2	U	< 5	U	< 5	U	< 5	U	< 2	U	< 1	U
1,2-Dichloroethane	µg/L	5	2.39		2.25		2.2		1.77		2.03		1		2.28		< 5	U	< 5	U	1.65	J	1.67		1.77	
Trichloroethene	µg/L	5	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 1	U	< 0.1	U	< 5	U	< 5	U	< 5	U	< 1	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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J - estimated value

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FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW07																					
		Sample ID	67WW07-012314		67WW07-050614		67WW07-072514		67WW07-120314		67WW07-021015		67WW07-051215		67WW07-111915		67WW07-051916		67WW07-112917		67WW07-180503		67WW07-181025		67WW07-190503	
		Sample Date	1/23/2014		5/6/2014		7/25/2014		12/3/2014		2/10/2015		5/12/2015		11/19/2015		5/19/2016		11/29/2017		5/3/2018		10/25/2018		5/3/2019	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	1.35		1.44		1.39		1.19		1.04		0.817	J	0.601	J	0.33	J	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW07								67WW08													
		Sample ID	67WW07-191028		67WW07-201102		67WW07-211110		67WW07-221108		67WW08-060313		67WW08-100213		67WW08-012314		67WW08-050714		67WW08-072414		67WW08-120414		67WW08-021115		67WW08-051915	
		Sample Date	10/28/2019		11/2/2020		11/10/2021		11/8/2022		6/3/2013		10/2/2013		1/23/2014		5/7/2014		7/24/2014		12/4/2014		2/11/2015		5/19/2015	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 5	U	< 2.5	U	< 5	U	< 5	U	< 5	U	< 5	U	< 5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	4.25		**5.08**	J	**6.7**		**5.01**	J	**7.74**	J	**7.36**	J	**6.96**	J	4.5	J
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	**940**		**1,120**		**1,340**		**1,590**		**1,890**		**2,320**		**1,930**		**1,570**	
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	**64.3**	R	**76.5**		**89.9**		**101**		**98.9**		**106**		**104**		**85.6**	
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	**6.25**	R	< 5	U	3.12	J	4.41	J	3.14	J	3.55	J	3.15	J	< 5	U

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FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

Location Code			67WW08																					
Sample ID			67WW08-111915		67WW08-051916		67WW08-112817		67WW08-112817-FD		67WW08-180501		67WW08-181023-FD		67WW08-181023		67WW08-190501		67WW08-191028		67WW08-191028-FD		67WW08-201103-FD		67WW08-201103	
Sample Date			11/19/2015		5/19/2016		11/28/2017		11/28/2017		5/1/2018		10/23/2018		10/23/2018		5/1/2019		10/28/2019		10/28/2019		11/3/2020		11/3/2020	
Sample Purpose			REG		REG		REG		FD		REG		FD		REG		REG		REG		FD		FD		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 5	U	< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	4.67	J	2.76	J	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	1,710		1,130		340		350		300		160		160		110		63		65		44		50	
1,2-Dichloroethane	µg/L	5	77.6		56.1		13		13		11		6.2		6.5		5.1		2.3		2.4		1.6		1.8	
Trichloroethene	µg/L	5	< 5	U	< 5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW08						67WW09															
		Sample ID	67WW08-211111		67WW08-221109		67WW08-221109-FD		67WW09-060113		67WW09-092813		67WW09-012414		67WW09-072514		67WW09-120414		67WW09FD-021115		67WW09-021115		67WW09-051915		67WW09FD-111815	
		Sample Date	11/11/2021		11/9/2022		11/9/2022		6/3/2013		9/28/2013		1/24/2014		7/25/2014		12/4/2014		2/11/2015		2/11/2015		5/19/2015		11/18/2015	
		Sample Purpose	REG		REG		FD		REG		REG		REG		REG		REG		FD		REG		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.2	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 0.3	U	< 0.3	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	**18**		**19**		**20**		**16.1**		**17.5**		**20.8**		**8.93**		**11.6**		**8.29**		**8.17**		2.71		1.62	J
1,2-Dichloroethane	µg/L	5	0.67	J	0.61	J	< 0.2	U	< 1	U	0.414	J	0.347	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.2	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW09																						67WW09A	
		Sample ID	67WW09-111815		67WW09-051816		67WW09FD-051816		67WW09-112717		67WW09-180502		67WW09-181023		67WW09-190503		67WW09-191024		67WW09-201103		67WW09-211111		67WW09-221108		67WW09A-092713	
		Sample Date	11/18/2015		5/18/2016		5/18/2016		11/27/2017		5/2/2018		10/23/2018		5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		9/27/2013	
		Sample Purpose	REG		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	5.5		< 0.3	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	1.66	J	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	UJ	< 0.2	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	29		< 0.2	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	1.4		< 0.2	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

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GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW09A																					
		Sample ID	67WW09A-092713-FD		67WW09A-012314		67WW09A-050614		67WW09AFD-072414		67WW09A-072414		67WW09AFD-120314		67WW09A-120314		67WW09A-021015		67WW09A-051215		67WW09A-111815		67WW09A-051816		67WW09A-112917	
		Sample Date	9/27/2013		1/23/2014		5/6/2014		7/24/2014		7/24/2014		12/3/2014		12/3/2014		2/10/2015		5/12/2015		11/18/2015		5/18/2016		11/29/2017	
		Sample Purpose	FD		REG		REG		FD		REG		FD		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW09A														67WW10									
		Sample ID	67WW09A-180503		67WW09A-181025		67WW09A-190502		67WW09A-191028		67WW09A-201102		67WW09A-211110		67WW09A-221109		67WW10-060113		67WW10-092713		67WW10-012414		67WW10-050614		67WW10-072414	
		Sample Date	5/3/2018		10/25/2018		5/2/2019		10/28/2019		11/2/2020		11/10/2021		11/9/2022		6/1/2013		9/27/2013		1/24/2014		5/6/2014		7/24/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 2	U	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

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MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW10																					
		Sample ID	67WW10-120314		67WW10-021015		67WW10-051215		67WW10-111815		67WW10-051816		67WW10-112917		67WW10-180503		67WW10-181022		67WW10-190502		67WW10-191028		67WW10-201102		67WW10-211110	
		Sample Date	12/3/2014		2/10/2015		5/12/2015		11/18/2015		5/18/2016		11/29/2017		5/3/2018		10/22/2018		5/2/2019		10/28/2019		11/2/2020		11/10/2021	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

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Table 2-5
Historical Contaminants of Concern

		Location Code	67WW10		67WW11																			
		Sample ID	67WW10-221109		67WW11-060113-FD		67WW11-060113		67WW11-100213		67WW11 FD-012314		67WW11-012314		67WW11FD-012314		67WW11-072414		67WW11-120414		67WW11-021115		67WW11-051915		67WW11-111915	
		Sample Date	11/9/2022		6/1/2013		6/1/2013		10/2/2013		1/23/2014		1/23/2014		1/23/2014		7/24/2014		12/4/2014		2/11/2015		5/19/2015		11/19/2015	
		Sample Purpose	REG		FD		REG		REG		FD		REG		FD		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.2	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.3	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 0.2	U	46.8		47.1		42.8		43		38.8		43		34.5		37.5		30.4		21.6		28.5	
1,2-Dichloroethane	µg/L	5	< 0.2	U	0.85	J	0.869	J	0.799	J	0.823	J	0.748	J	0.823	J	0.684	J	0.567	J	0.559	J	0.518	J	0.513	J
Trichloroethene	µg/L	5	< 0.2	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW11																67WW12					
		Sample ID	67WW11-051916		67WW11-112717		67WW11-180502		67WW11-181023		67WW11-190501		67WW11-191024		67WW11-201103		67WW11-211111		67WW11-221108		67WW12-060113		67WW12-100113		67WW12-012414	
		Sample Date	5/19/2016		11/27/2017		5/2/2018		10/23/2018		5/1/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		6/1/2013		10/1/2013		1/24/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 1	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	**19.3**		5.2		5.5		6.1		2.8		1.9		1.2		< 0.5	U	< 0.2	U	< 2	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	0.396	J	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 1	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

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GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW12																					
		Sample ID	67WW12-050614		67WW12-072514		67WW12-120314		67WW12-021015		67WW12-051215		67WW12FFD-111815		67WW12-111815		67WW12-051816		67WW12-112917-FD		67WW12-112917		67WW12-180503		67WW12-181022	
		Sample Date	5/6/2014		7/25/2014		12/3/2014		2/10/2015		5/12/2015		11/18/2015		11/18/2015		5/18/2016		11/29/2017		11/29/2017		5/3/2018		10/22/2018	
		Sample Purpose	REG		REG		REG		REG		REG		FD		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	0.681	J	1.8		2.2		< 0.5	U	4.8	
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U			< 0.5	U	< 0.5	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U

Notes:

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Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW12										67WW13											
		Sample ID	67WW12-190502		67WW12-191028		67WW12-201102		67WW12-211110		67WW12-221108		67WW13-053113		67WW13-100113		67WW13-012414		67WW13FD-012414		67WW13FD-050614		67WW13-050614		67WW13FD-072514	
		Sample Date	5/2/2019		10/28/2019		11/2/2020		11/10/2021		11/8/2022		5/31/2013		10/1/2013		1/24/2014		1/24/2014		5/6/2014		5/6/2014		7/25/2014	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		FD		FD		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 10	U	< 0.5	U	< 1.25	U	< 1.25	U	< 1	U	< 1	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	2.91	J	3.37		2.99		3.01		1.95	J	1.99	J	3.56	
1,1-Dichloroethene	µg/L	7	2.1		17		40		6.5		40		498		515		572		569		228		240		362	
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	19.9		23.8		22.9		22.9		12.9		13.7		20.1	
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	2.71	J	2.81		2.86		2.99		1.27	J	1.25	J	1.71	

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µg/L - micrograms per liter

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FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

Location Code			67WW13																					
Sample ID			67WW13-072514		67WW13-120414		67WW13FD-120414		67WW13-021115		67WW13-051915		67WW13-111815		67WW13-051916		67WW13-112817		67WW13-180501		67WW13-180501FD		67WW13-181023		67WW13-190501	
Sample Date			7/25/2014		12/4/2014		12/4/2014		2/11/2015		5/19/2015		11/18/2015		5/19/2016		11/28/2017		5/1/2018		5/1/2018		10/23/2018		5/1/2019	
Sample Purpose			REG		REG		FD		REG		REG		REG		REG		REG		REG		FD		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 2.5	U	< 2.5	U	< 1.25	U	< 1.25	U	< 1.25	U	< 1	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	3.48		4.4	J	4.56	J	4.87		5.96		7.66		7		5.1		4.8		4.7		6.1		3.9	
1,1-Dichloroethene	µg/L	7	353		572		522		521		522		762		274		320		160		170		570		200	
1,2-Dichloroethane	µg/L	5	19.8		24.9		24.6		26		30.6		42.6		35.7		32		27		28		43		24	
Trichloroethene	µg/L	5	1.72		1.65	J	1.94	J	2.63		2.91		3.32		1.67	J	< 1	U	< 0.5	U	< 0.5	U	2.4		1.1	

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW13												67WW14									
		Sample ID	67WW13-190501-FD		67WW13-191028		67WW13-201103		67WW13-211111		67WW13-211111-FD		67WW13-221109		67WW14-100113-FD		67WW14-100113		67WW14-012414		67WW14-050714		67WW14-072514		67WW14-120314	
		Sample Date	5/1/2019		10/28/2019		11/3/2020		11/11/2021		11/11/2021		11/9/2022		10/1/2013		10/1/2013		1/24/2014		5/7/2014		7/25/2014		12/3/2014	
		Sample Purpose	FD		REG		REG		REG		FD		REG		FD		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	3.8		5		5.7		< 1	UJ	5.9	J	4.3		< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	160		640		720		< 0.5	UJ	410	J	480		2.22		1.82	J	2.58		4.27		3.57		4.73	
1,2-Dichloroethane	µg/L	5	23		36		44		< 0.5	UJ	43	J	34		0.849	J	0.692	J	0.666	J	0.897	J	1.31		0.79	J
Trichloroethene	µg/L	5	1		2.6		3.1		< 0.5	UJ	2.4	J	2.1	J	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW14																					
		Sample ID	67WW14-021015		67WW14FD-021015		67WW14-051215		67WW14FD-051215		67WW14-111815		67WW14-051816		67WW14-112717		67WW14-180502		67WW14-181022		67WW14-190502		67WW14-191024		67WW14-201102	
		Sample Date	2/10/2015		2/10/2015		5/12/2015		5/12/2015		11/18/2015		5/18/2016		11/27/2017		5/2/2018		10/22/2018		5/2/2019		10/24/2019		11/2/2020	
		Sample Purpose	REG		FD		REG		FD		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	3.46		3.61		2.77		2.93		**26.3**		**10.8**		5.6		4.2		6.6		5.3		**7.4**		4.9	
1,2-Dichloroethane	µg/L	5	0.64	J	0.657	J	0.799	J	0.815	J	**5.83**		3.54		3.1		1.9		2.5		1.8		1.5		< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW14				67WW15																		67WW16	
		Sample ID	67WW14-211110		67WW14-221107		67WW15-051916		67WW15-112717		67WW15-180502		67WW15-181023		67WW15-190503		67WW15-191024		67WW15-201103		67WW15-211111		67WW15-221108		67WW16-051816	
		Sample Date	11/10/2021		11/7/2022		5/19/2016		11/27/2017		5/2/2018		10/23/2018		5/3/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		5/18/2016	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.2	U	< 10	U	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 0.3	U	22.7		5.6		5.6		6		5.4		6.4		6.4		5.7		3.2		< 0.5	U
1,1-Dichloroethene	µg/L	7	3		1.2		2,460		510		380		670		330		640	J	730		420		640		< 1	U
1,2-Dichloroethane	µg/L	5	0.58	J	< 0.2	U	117		27		26		30		22		27		29		43		24		< 0.5	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.2	U	5.48	J	< 1	U	1.2		1.4		1.1		1.5		2		2.2		1.4		< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW16I																67WW17			
		Sample ID	67WW16I-112917		67WW16I-180503		67WW16I-181025		67WW16I-190501		67WW16I-191024		67WW16I-201103		67WW16I-211111		67WW16I-221108		67WW16I-221108-FD		67WW17-191024		67WW17-201102-FD	
		Sample Date	11/29/2017		5/3/2018		10/25/2018		5/1/2019		10/24/2019		11/3/2020		11/11/2021		11/8/2022		11/8/2022		10/24/2019		11/2/2020	
		Sample Purpose	REG		REG		REG		REG		REG		REG		REG		REG		FD		REG		FD	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U	< 0.3	U	< 0.5	U	< 0.5	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U
1,2-Dichloroethane	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U
Trichloroethene	µg/L	5	< 1	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U	< 0.2	U	< 0.5	U	< 0.5	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-5
Historical Contaminants of Concern

		Location Code	67WW17						67WW18									
		Sample ID	67WW17-201102		67WW17-211110		67WW17-221107		67WW18-191024		67WW18-191024-FD		67WW18-201102		67WW18-211110		67WW18-221107	
		Sample Date	11/2/2020		11/10/2021		11/7/2022		10/24/2019		10/24/2019		11/2/2020		11/10/2021		11/7/2022	
		Sample Purpose	REG		REG		REG		REG		FD		REG		REG		REG	
Parameter	Units	MCL/GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
1,1,1-Trichloroethane	µg/L	200	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,1,2-Trichloroethane	µg/L	5	< 0.5	U	< 1	U	< 0.3	U	< 0.5	U	< 0.5	U	< 0.5	U	< 1	U	< 0.3	U
1,1-Dichloroethene	µg/L	7	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
1,2-Dichloroethane	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U
Trichloroethene	µg/L	5	< 0.5	U	< 0.5	U	< 0.2	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.5	U	< 0.2	U

Notes:

Bold and highlighted results indicate analyte is above the MCL/GW-Ind.

µg/L - micrograms per liter

< The analyte was not detected above the detection limit shown.

J - estimated value

U - Not detected; The analyte was analyzed for but not detected above the associated method detection limit.

FD - field duplicate

GW-Ind - groundwater MSC for industrial use

ID - identifier

MCL - maximum contaminant level

MSC - medium-specific concentration

REG - regular sample

Val Qual - validation qualifier

Table 2-6

Well Maintenance Activities, Year 9 Remedial Action Operation

Well ID	Date Inspected	Pads	Bollards	Protective Casings	Locks	Date Mowed	Photos	Comments
67WW01	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW02	11/07/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW03	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW04	11/09/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW05	11/07/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW06	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW07	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW08	11/09/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW09	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW09A	11/09/22	Good	Good	Good	In Place	10/18/22	Yes	Greater than 50% rust on hinge
67WW10	11/09/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW11	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW12	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW13	11/09/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW14	11/07/22	Good	Good	Good	In Place	10/18/22	Yes	Greater than 50% rust on hinge
67WW15	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW16I	11/08/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW17	11/07/22	Good	Good	Good	In Place	10/18/22	Yes	
67WW18	11/07/22	Good	Good	Good	In Place	10/18/22	Yes	

Notes:

ID - identifier

Table 2-7
Year 10 Remedial Action Operation Sampling, 2023

Monitoring Well ID	VOCs	Field Parameters [a]	MNA Parameters [b]	Water Levels
67WW01	X	X		X
67WW02	X	X		X
67WW03	X	X		X
67WW04 [c]	Gauge for water levels only			X
67WW05	X	X		X
67WW06 [d]	Gauge for water levels only			X
67WW07	X	X		X
67WW08	X	X	X	X
67WW09	X	X		X
67WW09A	X	X		X
67WW10	X	X		X
67WW11	X	X		X
67WW12	X	X		X
67WW13	X	X	X	X
67WW14	X	X		X
67WW15	X	X		X
67WW16I	X	X		X
67WW17	X	X		X
67WW18	X	X		X

Notes:

[a] Field parameters to be monitored for all wells: pH, temperature, conductivity, turbidity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and ferrous iron.

[b] MNA parameters include nitrate, sulfate, chloride, TOC, dissolved gases (methane, ethane, ethene), carbon dioxide, and dissolved iron.

[c] 67WW04 was replaced by 67WW09A and 67WW10.

[d] 67WW06 was eliminated in May 2018 due to the close proximity of 67WW07.

X - Well will be analyzed for that parameter.

ID - identifier

MNA - monitored natural attenuation

RA-O - remedial action operation

TOC - total organic carbon

VOCs - volatile organic compounds

Table 3-1
Mann-Kendall Trend Summary, LHAAP-67

Monitoring Well	Well Location	1,1-DCE	1,2-DCA	1,1,2-TCA
67WW01	In Plume	Stable	Stable	NA
67WW02	Downgradient	Increasing	NA	NA
67WW08	Upgradient	Decreasing	NA	NA
67WW12	Cross gradient – East	Increasing	NA	NA
67WW13	In Plume	Stable	Increasing	Increasing
67WW15	In Plume	Stable	Stable	Stable

Notes:

DCA - dichloroethane

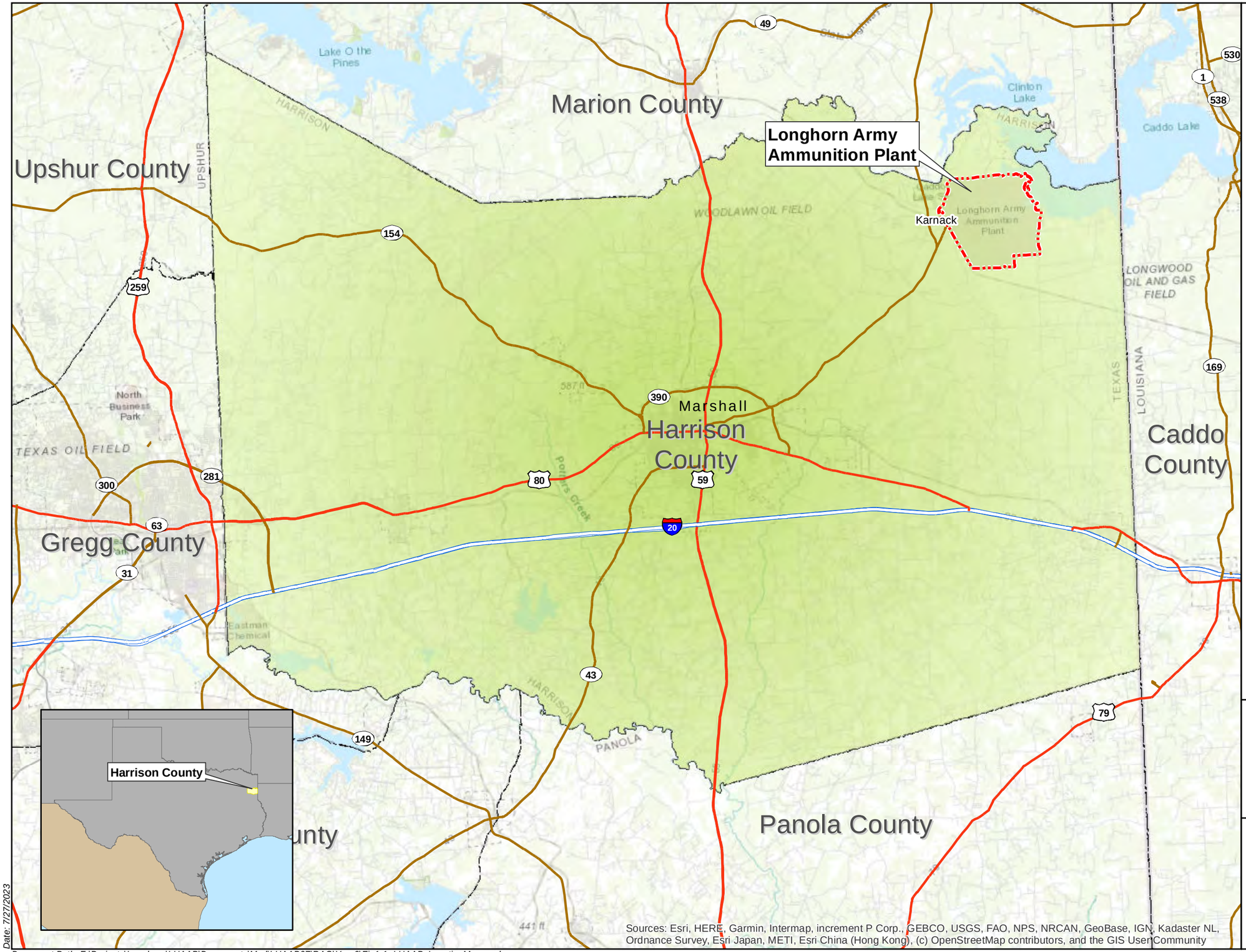
DCE - dichloroethene

MCL - maximum contaminant level

NA - Not analyzed because concentrations are below the MCL.

TCA - trichloroethane

Figures



Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation

N

0 2 4 Miles

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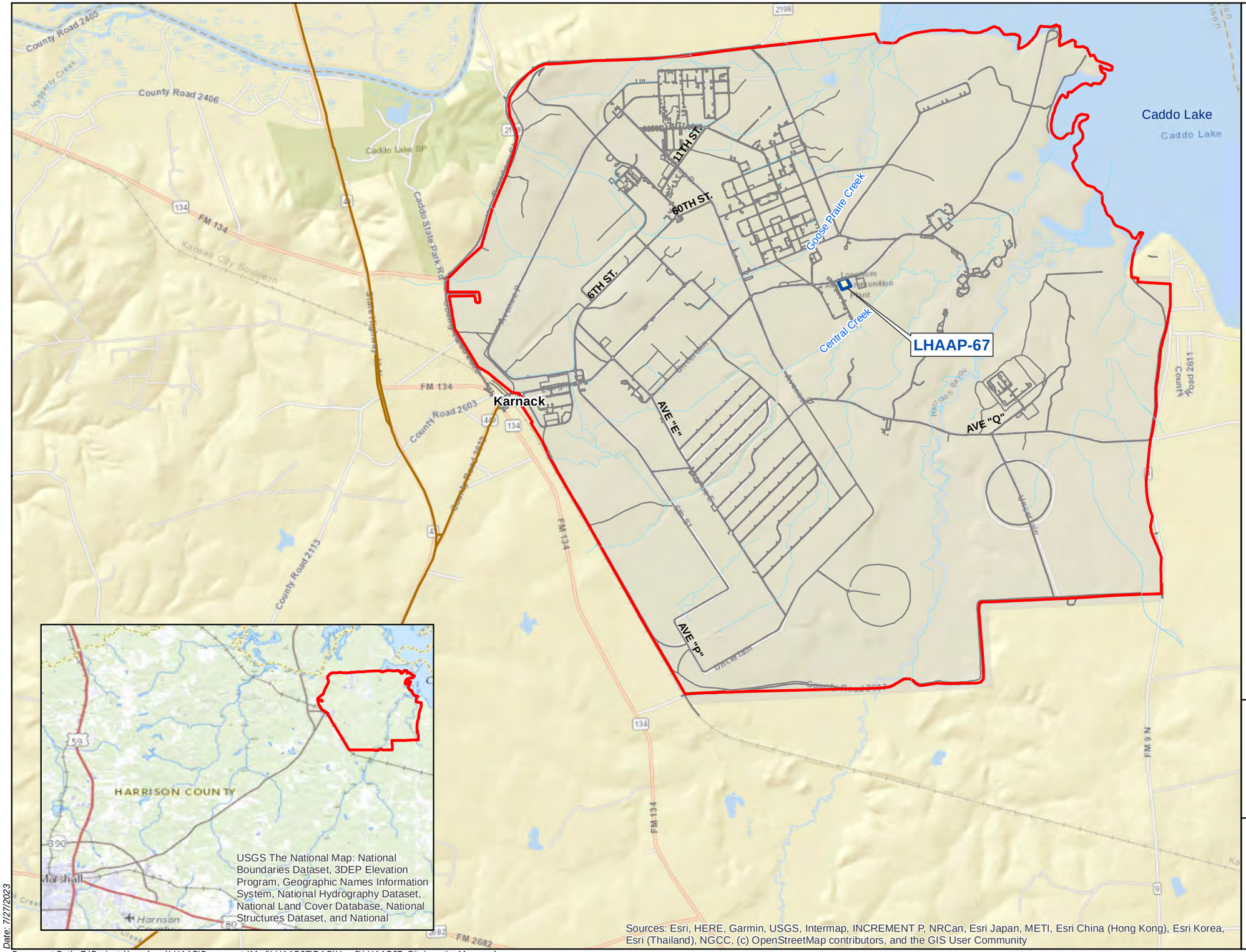
Figure 1-1

LHAAP Location Map
Ninth Annual RA-O Report
LHAAP-67

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\Fig1-1_LHAAP_LocationMap.mxd



Stream
Road
LHAAP Boundary
LHAAP-67 Site Boundary

Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation

N

0 1,500 3,000
Feet

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Figure 1-2

LHAAP Site Vicinity Map
Ninth Annual RA-O Report
LHAAP-67

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_SiteLocationMap.mxd

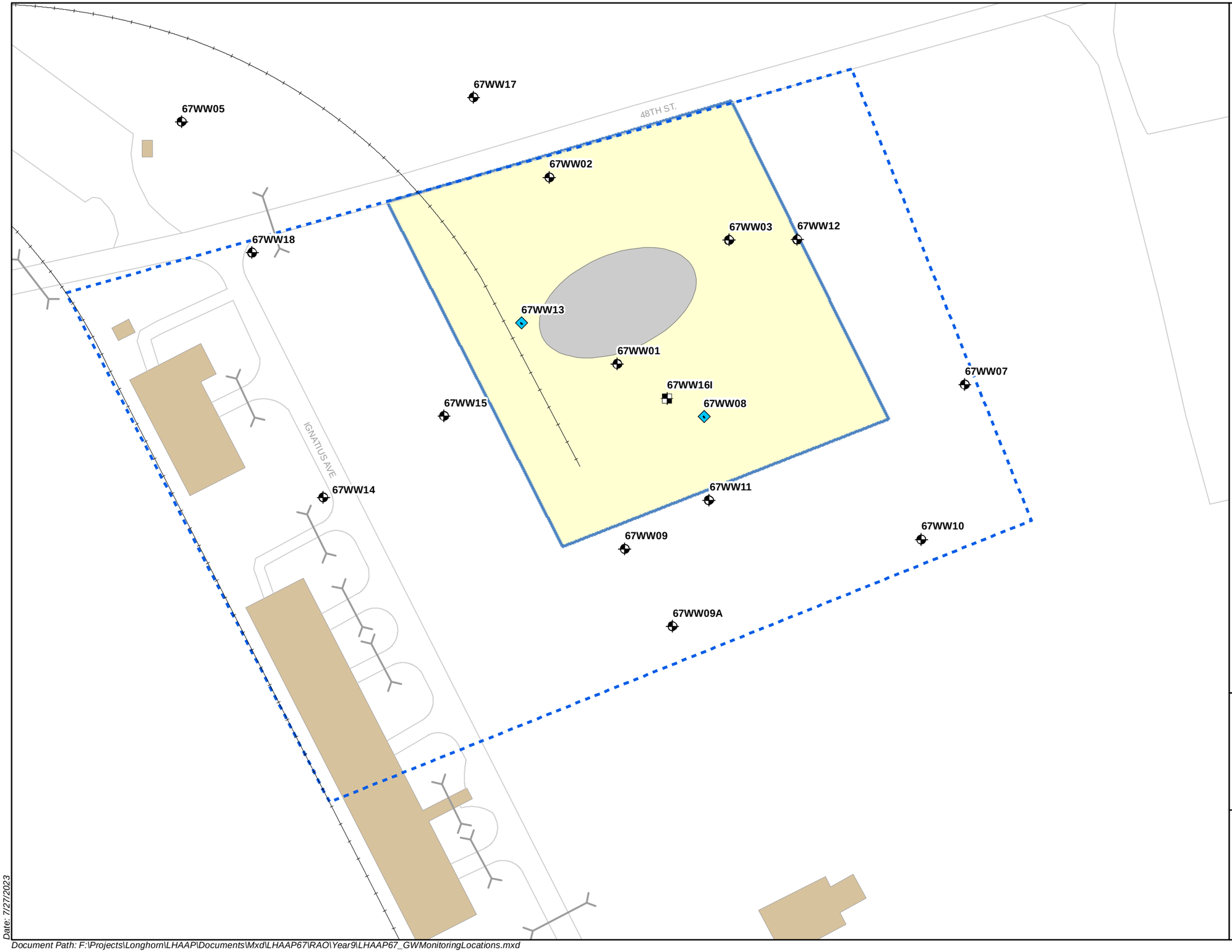

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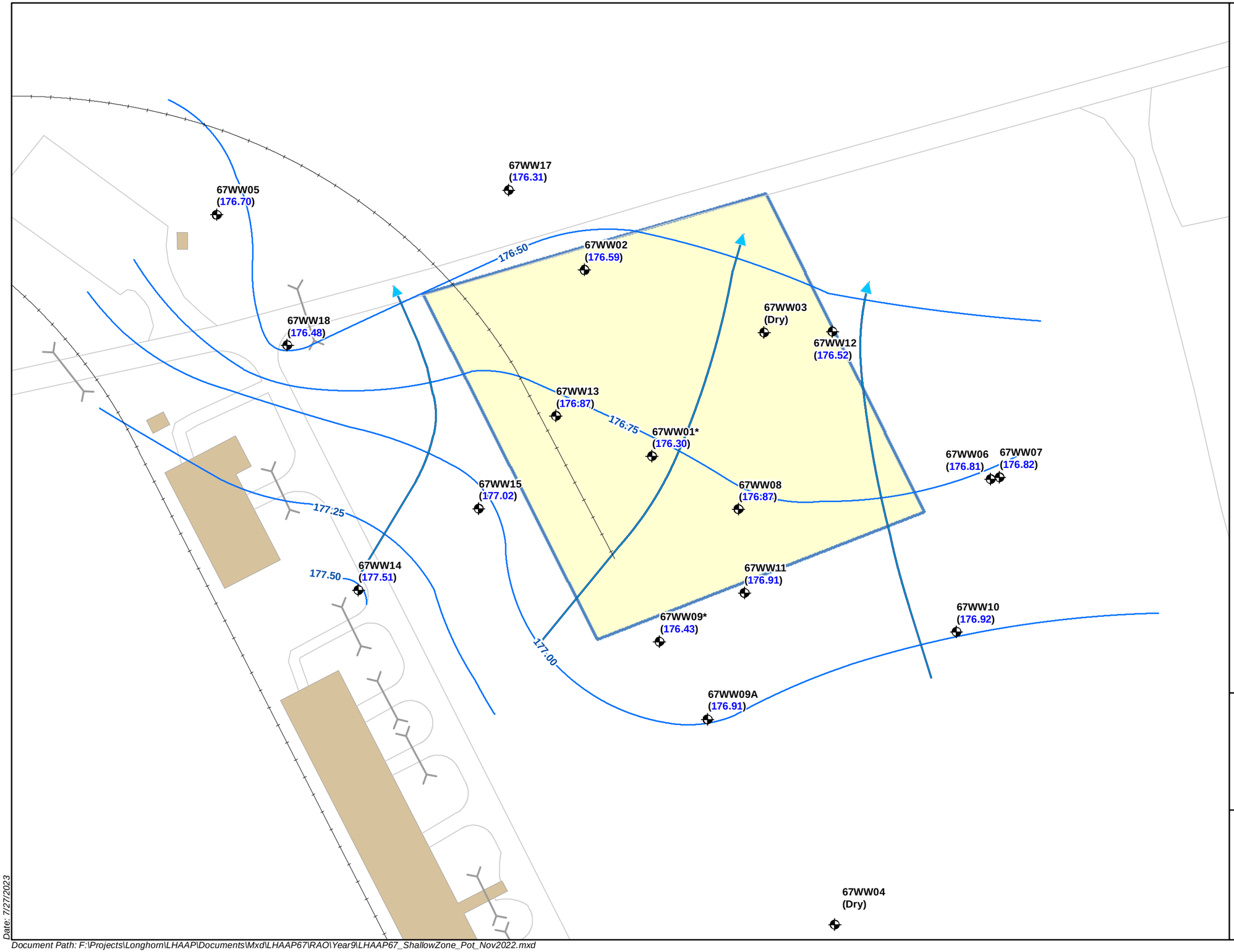
Figure 2-1

Groundwater Monitoring Well Locations
Ninth Annual RA-O Report
LHAAP-67

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_GWMonitoringLocations.mxd



Shallow Monitoring Well
Groundwater Flow Direction
Groundwater Contour
Former Railroad Location
Culvert
Roads
Buildings

Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation
3. Groundwater elevations are presented in feet above mean sea level (MSL).
4. *67WW01 and 67WW09 are believed to be anomalous and were not used to develop the potentiometric contours.

N

0 30 60
Feet

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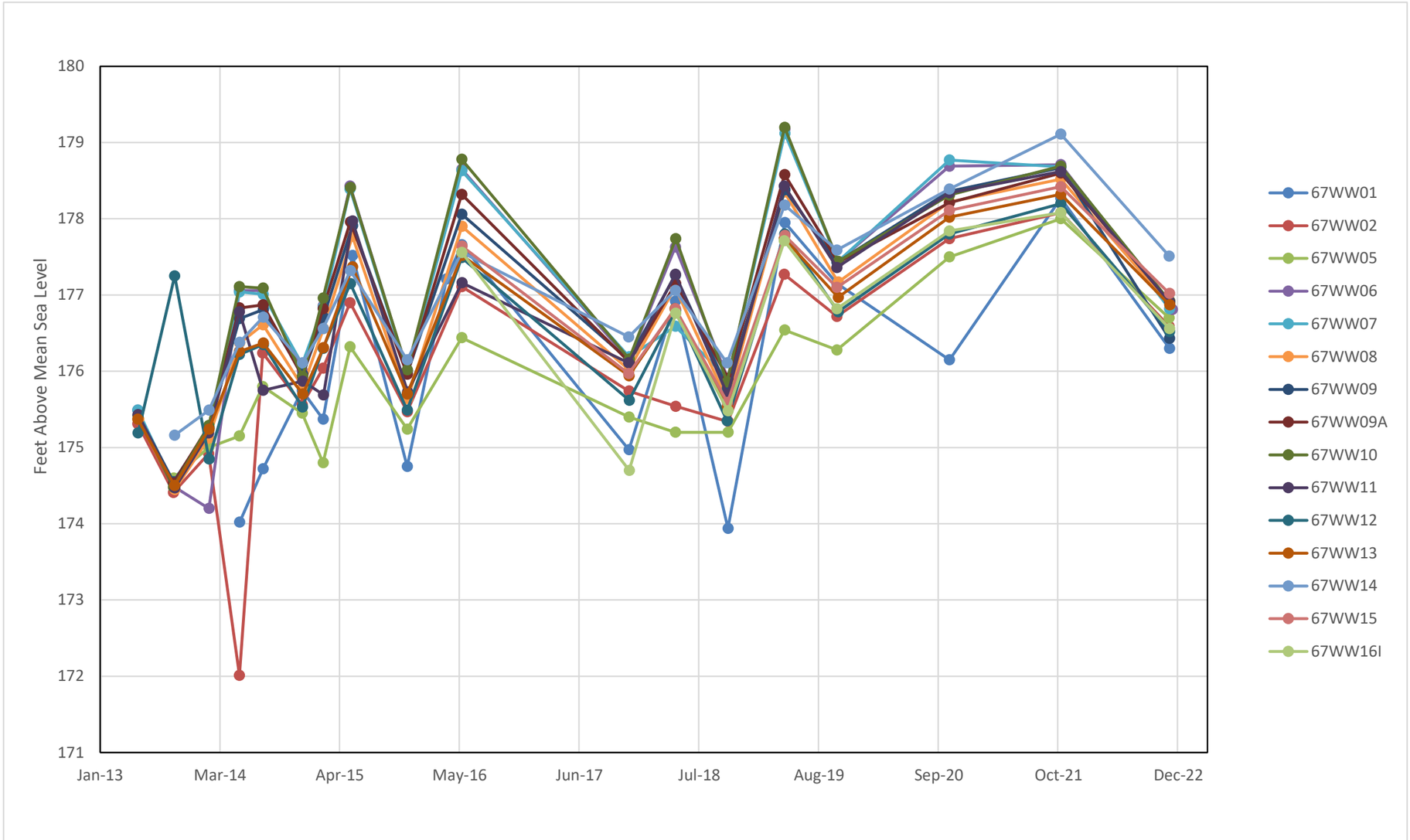
Figure 2-2
Shallow Zone Potentiometric Map - November 2022
Ninth Annual RA-O Report
LHAAP-67
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_ShallowZone_Pot_Nov2022.mxd



Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation

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Figure 2-3
Groundwater Elevations
2014-2022
Ninth Annual RA-O Report
LHAAP-67
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 8/24/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_GW_Elevations.mxd

67WW05		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW02		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	**100**
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW17		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW12		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	**40**
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW01		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	**36**
1,2-Dichloroethane	5	3.6
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW16I		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW18		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW08		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	**19**
1,2-Dichloroethane	5	0.61 J
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW13		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	4.3
1,1-Dichloroethene	7	**480**
1,2-Dichloroethane	5	**34**
cis-1,2-Dichloroethene	70	1.2
Trichloroethene	5	2.1 J

67WW14		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	1.2
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW15		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	3.2
1,1-Dichloroethene	7	**640**
1,2-Dichloroethane	5	**24**
cis-1,2-Dichloroethene	70	1
Trichloroethene	5	1.4
Vinyl chloride	2	< 0.2 U

67WW09		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW11		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW09A		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW07		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

67WW10		
Analyte	MCL	Nov 2022
1,1,1-Trichloroethane	200	< 0.2 U
1,1,2-Trichloroethane	5	< 0.3 U
1,1-Dichloroethene	7	< 0.2 U
1,2-Dichloroethane	5	< 0.2 U
cis-1,2-Dichloroethene	70	< 0.2 U
Trichloroethene	5	< 0.2 U
Vinyl chloride	2	< 0.2 U

7-µg/L

5-µg/L

7-µg/L

67WW03
Dry

67WW06

67WW04

- Shallow Monitoring Well for VOC and MNA Parameter Analyes
- Shallow Monitoring Well for VOC Analysis
- Intermediate Monitoring Well for VOC Analysis
- Former Railroad Location
- Groundwater Flow Direction
- 1,1-Dichloroethene Contour (*Dashed where inferred*)
- 1,2-Dichloroethane Contour
- Culvert
- Roads
- Buildings
- LHAAP-67 Site Boundary

Notes:
1. Data Qualifiers:
J = Estimated value; analyte concentration was less than the limit of quantification.
U = Analyte was not detected
2. Result highlighted yellow indicates results exceeds MCL.
3. MCL = Maximum Contaminant Level
4. All concentrations are in microgram per liter (µg/L)
5. RA-O = Remedial Action Operation
6. LHAAP = Longhorn Army Ammunition Plant
7. 67WW16I is an intermediate well and data was not used for contour lines.
8. MNA = Monitored Natural Attenuation
9. VOC = Volatile Organic Compounds

Monitoring wells 67WW04 and 67WW06 are no longer part of the RA-O monitoring network and are only used for groundwater-level measurements.

0 35 70
Feet

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TULSA DISTRICT
TULSA, OKLAHOMA

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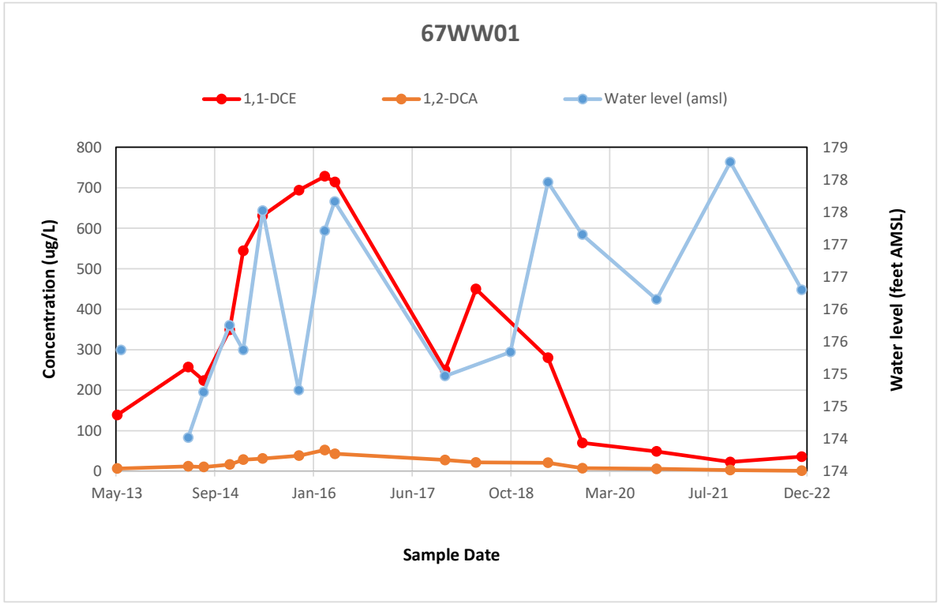
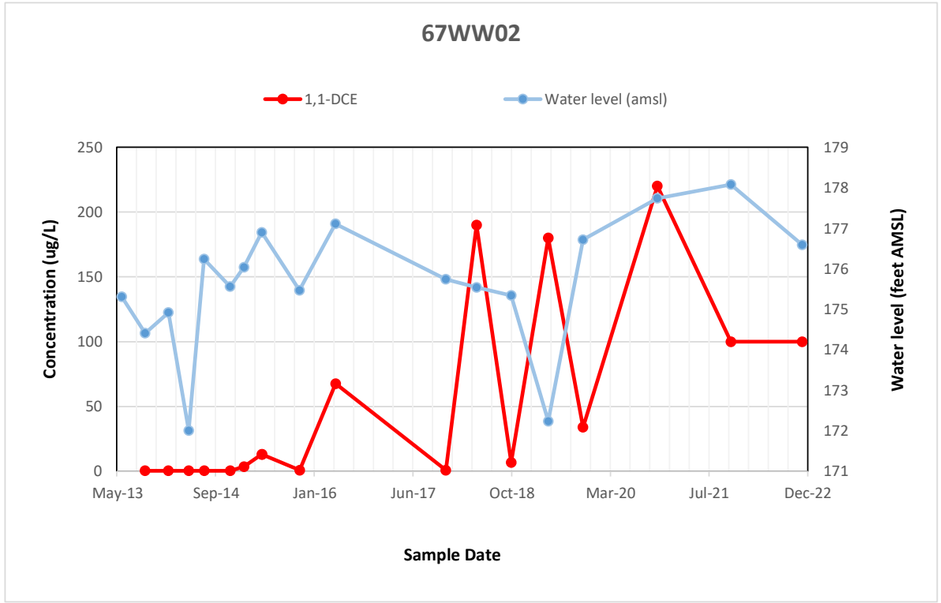
Figure 2-4

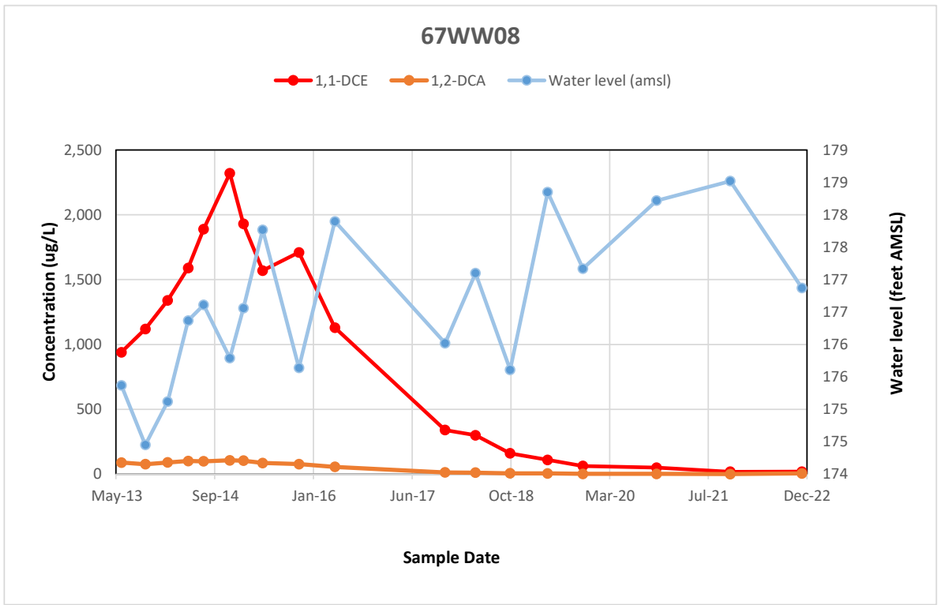
Groundwater Results
November 2022
Ninth Annual RA-O Report
LHAAP-67

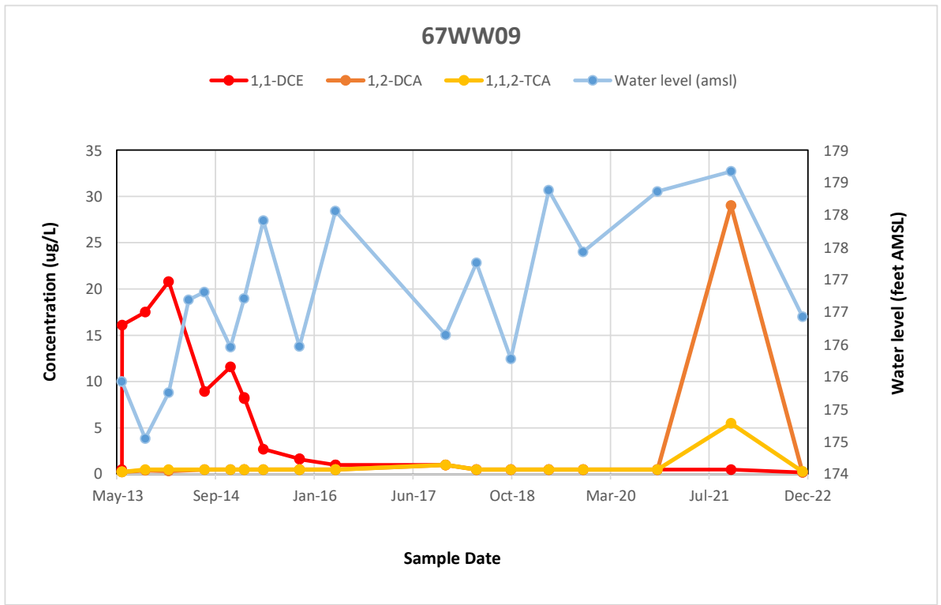
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_VOCsShallowZoneNov2022_GW.mxd









Cleanup Levels:
1,1-Dichlorothene (1,1-DCE) = 7 µg/L
1,2-Dichlorethane (1,2-DCA) = 5 µg/L
1,1,2-Trichloroethane (1,1,2-TCA) = 5 µg/L

Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation
3. µg/L = micrograms per liter
4. feet AMSL = feet above mean sea level

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TULSA, OKLAHOMA

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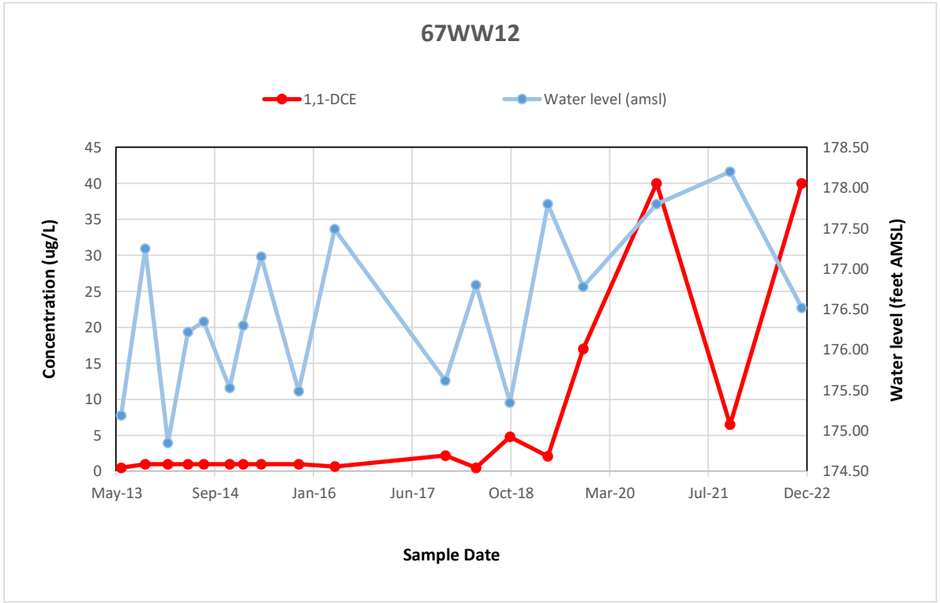
Figure 3-1a

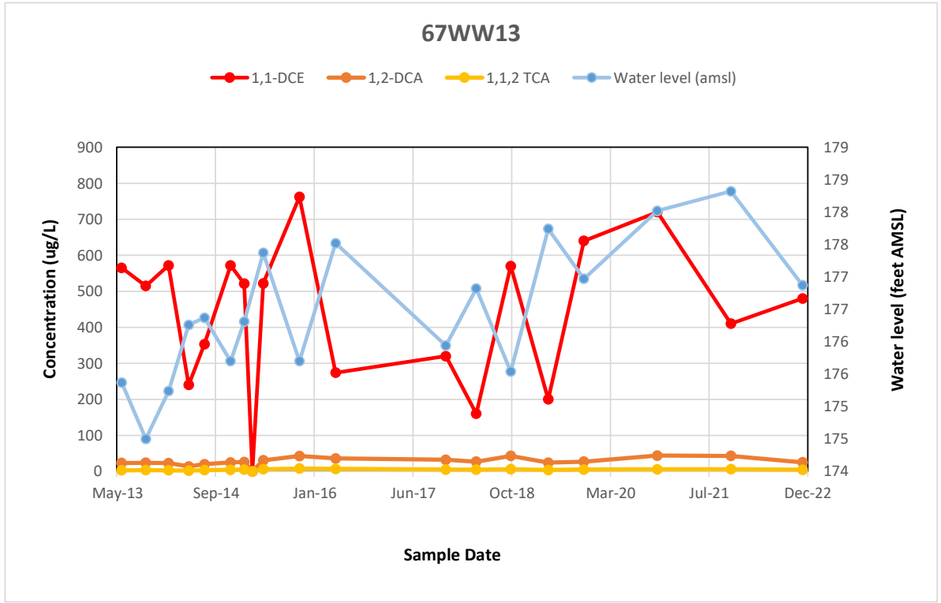
COC Concentrations
Ninth Annual RA-O Report
LHAAP-67

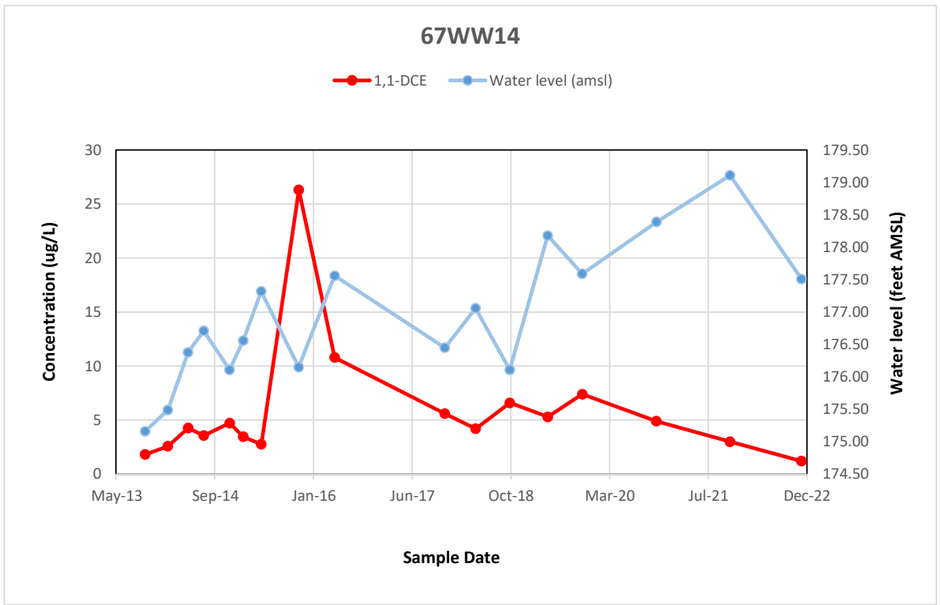
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

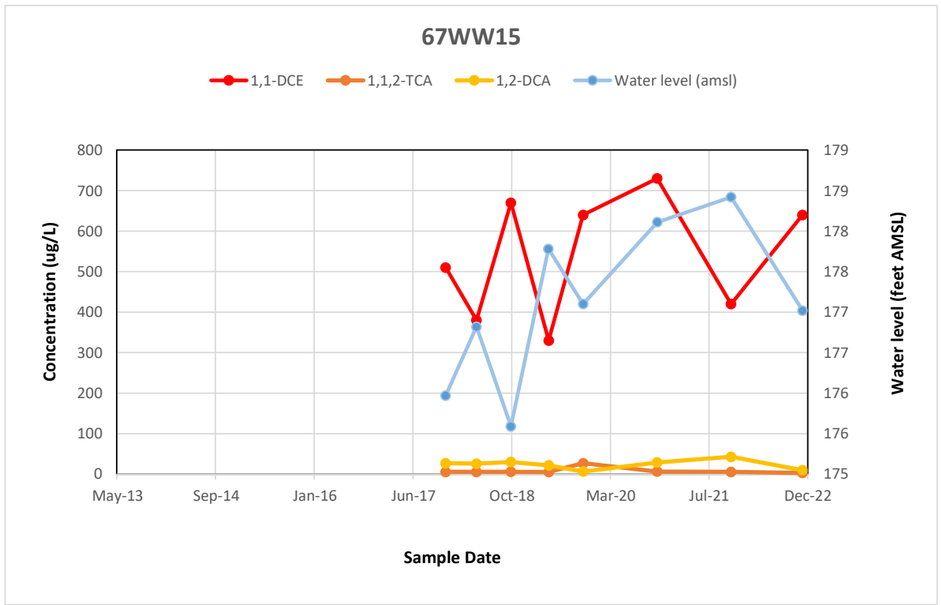
Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_COC_Concentrations_1.mxd









Cleanup Levels:
1,1-Dichlorothene (1,1-DCE) = 7 µg/L
1,2-Dichlorethane (1,2-DCA) = 5 µg/L
1,1,2-Trichloroethane (1,1,2-TCA) = 5 µg/L

Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation
3. µg/L = micrograms per liter
4. feet AMSL = feet above mean sea level

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TULSA, OKLAHOMA

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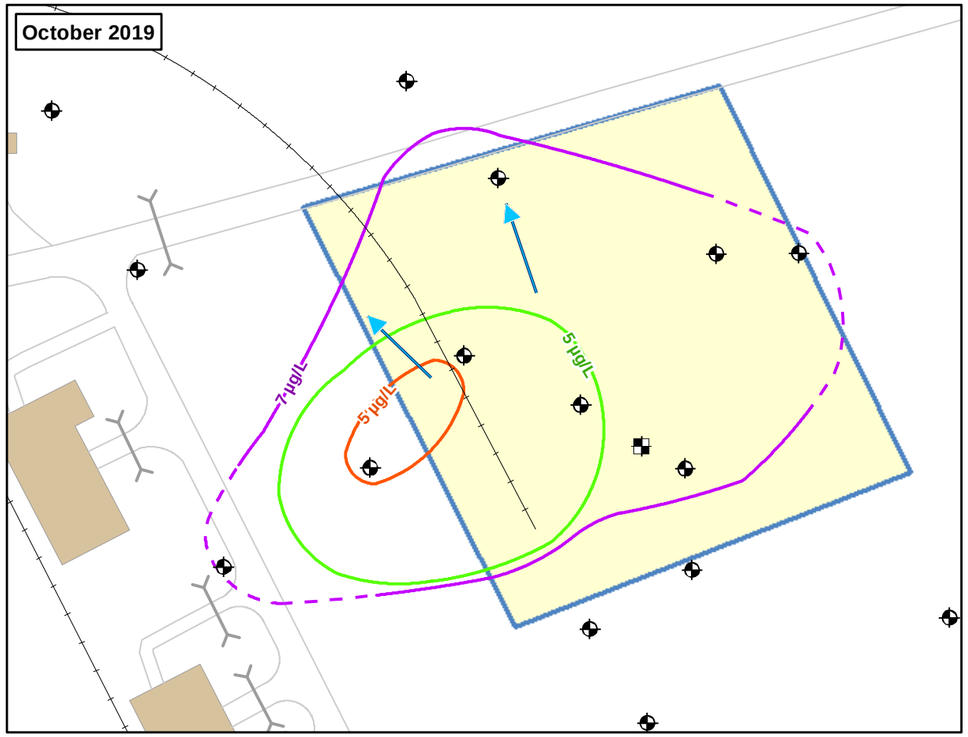
Figure 3-1b

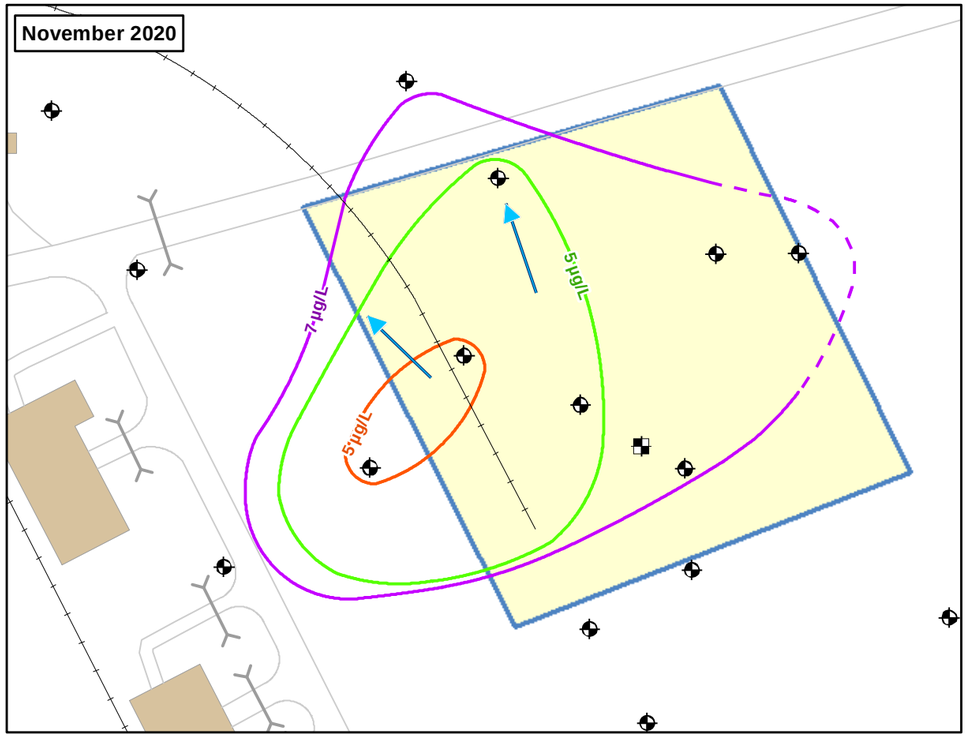
COC Concentrations
Ninth Annual RA-O Report
LHAAP-67

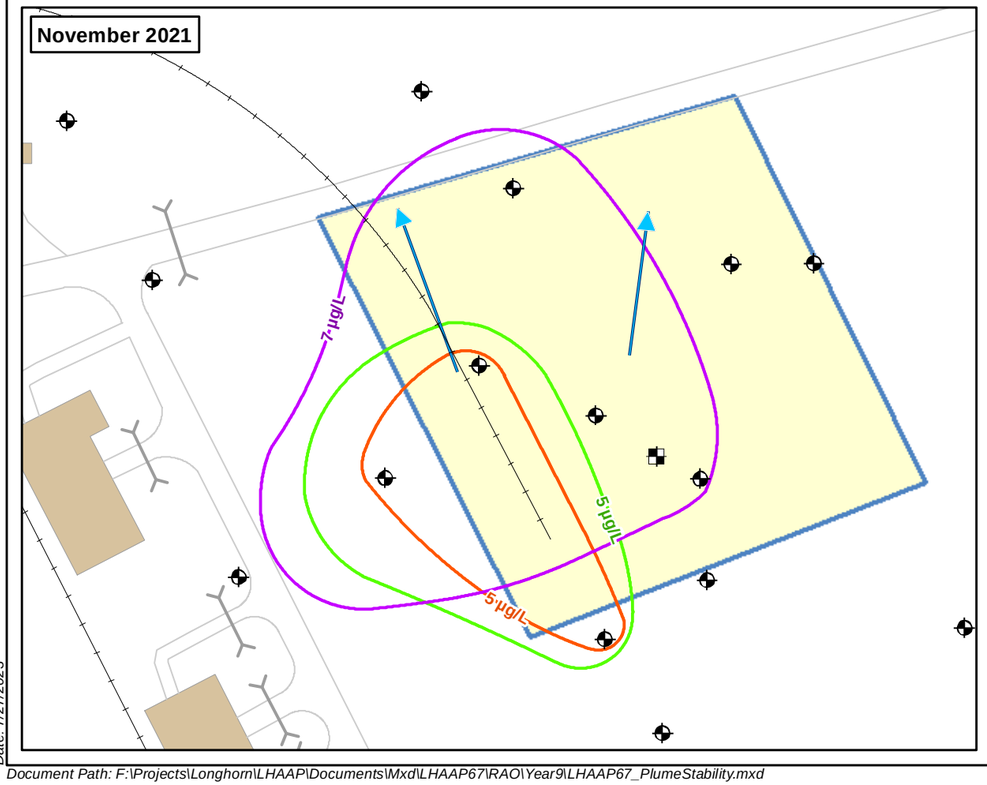
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

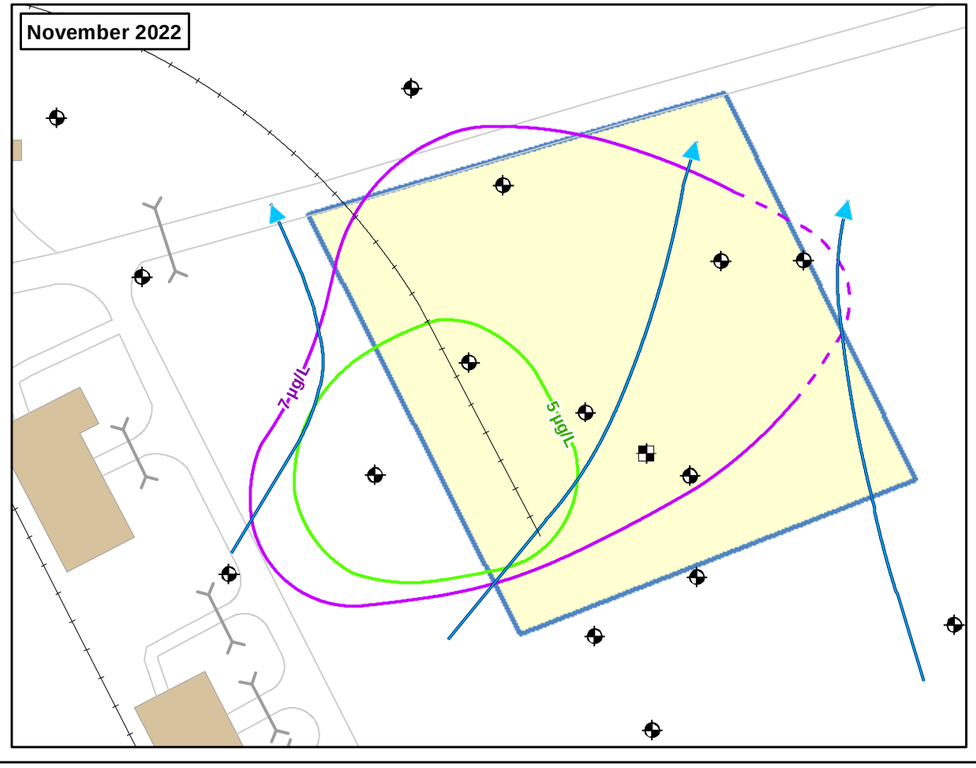
Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_COC_Concentrations_2.mxd









- Shallow Monitoring Well
- Intermediate Monitoring Well
- Former Railroad Location
- Groundwater Flow Direction
- 1,1,2-Trichloroethane Contour
- 1,1-Dichloroethene Contour (*Dashed where inferred*)
- 1,2-Dichloroethane Contour
- Culvert
- Roads
- Buildings
- LHAAP-67 Site Boundary

Notes:
1. LHAAP = Longhorn Army Ammunition Plant
2. RA-O = Remedial Action Operation

N

0 35 70 Feet

U.S. ARMY CORP OF ENGINEERS
TULSA DISTRICT
TULSA, OKLAHOMA

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Figure 3-2

Plume Stability
Ninth Annual RA-O Report
LHAAP-67

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Date: 7/27/2023

Document Path: F:\Projects\Longhorn\LHAAP\Documents\Mxd\LHAAP67\RAO\Year9\LHAAP67_PlumeStability.mxd

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • September 2023

Appendix A

Annual Land-Use Control Compliance Certification and Documentation

Sample Annual Land Use Control Compliance Certification Documentation

In accordance with the Remedial Design dated SEPTEMBER 2011 for LHAAP-67 a certification of site was conducted by APTIM [indicate transferee] on NOVEMBER 7, 2022

A summary of land use control mechanisms is as follows:

Groundwater restriction – restriction of the use of groundwater to environmental monitoring and testing until cleanup levels are met [Indicate whether groundwater restrictions are still required at LHAAP-67]

A summary of compliance with land use and restriction covenants is as follows:

No use of groundwater, installation of new groundwater wells, or tampering with existing wells at LHAAP-67.

I, the undersigned, do document that the certification was performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: NOVEMBER 7, 2022

Name/Title: Scott Beesinger/Senior Environmental Tech

Signature: Scott Beesinger

Annual compliance certification forms shall be completed no later than March 1 of each year for the previous calendar year.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • September 2023

Appendix B

Groundwater Sampling Forms

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**
Project No: **501032**

Location ID: **67WW01**
Sampler(s): Scott Beesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW01-2211 08 **DATE/TIME:** 11/8/22 0929 **Pump Inlet Depth:** 25.00

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing
Purging Method/Equipment: Low flow/Bladder Pump
Casing ID (in.): 4
Purge Start Date/Time: 11/8/22 0935
Depth to Water - Initial (DTWi) (ft) 24.62
Purge End Date/Time: 11/8/22 1005
Depth to Well Bottom (ft) 26.95
Discharge Tube Length: NA
PID Reading: NA
Screen Interval (ft): 14.68 - 24.68
Discharge Tube Diameter: 1/4"
Immiscible Layer: Y / (N)
Approximate depth of pump inlet*(ft): 25.00
Pump Start Time: 0935
Ferrous Iron (Required (Y) or N) 1.50 mg/L

2ND DTW - 24.62

APTIM

Sample Collection Log

Location ID: 67WW01 Sample No: 67WW01-221108

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	0940	100	.5	24.70	3.39	20.30	6.43	207	-45	1.43
	0945	100	1.0	24.76	3.60	20.38	6.48	140	-39	1.20
	0950	100	1.5	24.80	3.70	20.35	6.54	137	-32	1.09
	0955	100	2.0	24.83	3.71	20.32	6.54	136	-31	1.08
	1000	100	2.5	24.86	3.72	20.29	6.55	135	-30	1.07
↓	1005	100	3.0	24.88	3.72	20.27	6.55	134	-30	1.06

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW02**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW02-221107 **DATE/TIME:** 11/7/22 1116 **Pump Inlet Depth:** 24.00

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/7/22 1140

Depth to Water - Initial (DTWi) (ft) 23.10

Purge End Date/Time: 11/7/22 1210

Depth to Well Bottom (ft) ~~27~~ 27.80

Discharge Tube Length: ~~NA~~

PID Reading: NA

Screen Interval (ft): 18.08 - 28.08

Discharge Tube Diameter: 1/4"

Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~20~~ 24.00

Pump Start Time: 1140

Ferrous Iron (Required (Y) or N) 0.94 mg/L

2ND DTW - 23.10

APTIM

Sample Collection Log

Location ID: 67WW02 Sample No: 67WW02-221107

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	1145	100	.5	23.17	4.44	23.15	7.36	354	103	0.70
	1150	100	1.0	23.23	4.50	23.37	6.51	342	96	0.25
	1155	100	1.5	23.27	4.52	23.86	6.31	336	91	0.08
	1200	100	2.0	23.30	4.53	23.93	6.30	335	90	0.08
	1205	100	2.5	23.32	4.54	23.97	6.30	334	89	0.07
	1210	100	3.0	23.34	4.54	24.01	6.29	333	89	0.07

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW03**

Sampler(s): Scott Baggingard

FIELD CONDITIONS

Cloudy

SAMPLING INFORMATION

Sample No: 67WW03-221108 **DATE/TIME:** 11/8/22 1011 **Pump Inlet Depth:** NA

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/8/22 NA

Depth to Water - Initial (DTWi) (ft) DRY

Purge End Date/Time: 11/8/22 NA

Depth to Well Bottom (ft) 24.88

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 16.32-26.32

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / N

Approximate depth of pump inlet*(ft):

Pump Start Time: NA

Ferrous Iron (Required Y or N) NA mg/L

2ND DTW - DRY

APTIM

Sample Collection Log

Location ID: 67WW03 Sample No: 67WW03-221108

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22										
			Dry		Well					

Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW05**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

SAMPLING INFORMATION

Sample No: 67WW05-221107 **DATE/TIME:** 11/7/22 0901 **Pump Inlet Depth:** 25.00

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/7/22 0905

Depth to Water - Initial (DTWi) (ft) 24.30

Purge End Date/Time: 11/7/22 0935

Depth to Well Bottom (ft) ~~27~~ 30.06

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 19.52 - 29.52

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~24~~ 25.00

Pump Start Time: 0905

Ferrous Iron (Required (Y) or N) ~~0~~ 3.42 mg/L

2ND DTW - 24.30

APTIM

Sample Collection Log

Location ID: 67WW05 Sample No: 67WW05-2211_07

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	0910	100	.5	24.38	2.55	21.59	6.15	95.8	-5	0.80
	0915	100	1.0	24.44	2.61	20.83	6.09	91.3	-15	0.48
	0920	100	1.5	24.48	2.63	20.69	6.09	88.8	-10	0.61
	0925	100	2.0	24.51	2.64	20.66	6.09	88.4	-10	0.63
	0930	100	2.5	24.54	2.64	20.63	6.09	87.6	-9	0.65
	0935	100	3.0	24.56	2.64	20.58	6.09	87.2	-9	0.67

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW07**

Sampler(s): Scott Baggingar

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW07-221108 **DATE/TIME:** 11/8/22 1057 **Pump Inlet Depth:** 24.75

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/8/22 1105

Depth to Water - Initial (DTWi) (ft) 24.02

Purge End Date/Time: 11/8/22 1135

Depth to Well Bottom (ft) ~~24~~ 27.80

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 17.80-27.80

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~25~~ 24.75

Pump Start Time: 1105

Ferrous Iron (Required (Y) or N) 2.89 mg/L

2ND DTW- 24.02

APTIM

Sample Collection Log

Location ID: 67WW07 Sample No: 67WW07-221108

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22	1110	100	.5	24.09	2.37	20.61	6.91	169	32	0.81
	1115	100	1.0	24.15	2.42	20.21	6.55	150	19	0.40
	1120	100	1.5	24.18	2.42	20.17	6.44	143	15	0.22
	1125	100	2.0	24.20	2.43	20.13	6.43	142	14	0.21
	1130	100	2.5	24.22	2.43	20.09	6.42	141	14	0.21
	1135	100	3.0	24.23	2.43	20.05	6.41	141	14	0.20

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW08**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW08-2211_09 **DATE/TIME:** 11/9/22 0802 **Pump Inlet Depth:** 38.27

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/9/22 0810

Depth to Water - Initial (DTWi) (ft) 23.15

Purge End Date/Time: 11/9/22 0840

Depth to Well Bottom (ft) ~~43.8~~ 51.87

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 26.02 - 50.52

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~38.95~~ 38.27

Pump Start Time: 0810

Ferrous Iron (Required (Y) or N) 0.66 mg/L

2ND DTW - 23.15

APTIM

Sample Collection Log

Location ID: 67WW08 Sample No: 67WW08-221109

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0815	100	.5	23.22	5.60	19.91	5.98	6.3	49	0.70
	0820	100	1.0	23.27	6.47	19.80	6.00	2.8	70	0.21
	0825	100	1.5	23.31	6.69	19.76	6.01	1.1	75	0.06
	0830	100	2.0	23.33	6.70	19.72	6.02	0.3	76	0.06
	0835	100	2.5	23.34	6.71	19.69	6.02	0.0	76	0.05
	0840	100	3.0	23.35	6.71	19.64	6.02	0.0	76	0.05

Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW08**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW08-221109-FD **DATE/TIME:** 11/9/22 0802 **Pump Inlet Depth:** 38.27

Sampling Method: LF **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/9/22 0810

Depth to Water - Initial (DTWi) (ft) 23.15

Purge End Date/Time: 11/9/22 0840

Depth to Well Bottom (ft) ~~49.2~~ 51.87

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 26.02-50.52

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / N

Approximate depth of pump inlet*(ft): ~~35.25~~ 38.27

Pump Start Time: 0810

Ferrous Iron (Required for N) 0.66 mg/L

2ND DTW- 23.15

APTIM

Sample Collection Log

Location ID: 67WW08 Sample No: 67WW08-221109-FD

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0815	100	.5	23.22	5.60	19.91	5.98	6.3	49	0.70
	0820	100	1.0	23.27	6.47	19.80	6.00	2.8	70	0.21
	0825	100	1.5	23.31	6.69	19.76	6.01	1.1	75	0.06
	0830	100	2.0	23.33	6.70	19.72	6.02	0.3	76	0.06
	0835	100	2.5	23.34	6.71	19.69	6.02	0.0	76	0.05
↓	0840	100	3.0	23.35	6.71	19.64	6.02	6.0	76	0.05

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW09**

Sampler(s): Scott Brassington

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW09-2211~~08~~ **DATE/TIME:** 11/8/22 0706 **Pump Inlet Depth:** 26.74

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Depth to Water - Initial (DTWi) (ft) ~~21.78~~ 21.78

Purge Start Date/Time: 11/8/22 0715

Purge End Date/Time: 11/8/22 0745

Depth to Well Bottom (ft) ~~37.38~~ 37.38

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 16.99 - 36.49

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~24.38~~ 26.74

Pump Start Time: 0715

Ferrous Iron (Required (Y) or N) 0.09 mg/L

2ND DTW- ~~21.78~~ 21.78

APTIM

Sample Collection Log

Location ID: 67WW09 Sample No: 67WW09-221108

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	0720	100	.5	21.85	2.93	20.82	6.46	4.4	216	0.69
	0725	100	1.0	21.91	2.97	20.42	6.24	1.8	221	0.28
	0730	100	1.5	21.95	3.00	20.31	6.15	0.8	218	0.05
	0735	100	2.0	21.98	3.01	20.26	6.14	0.0	218	0.05
	0740	100	2.5	22.00	3.01	20.22	6.13	0.0	217	0.04
↓	0745	100	3.0	22.02	3.02	20.18	6.13	0.0	217	0.04

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW09A**

Sampler(s): Scott Beggs, Inger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW09A-221109 **DATE/TIME:** 11/9/22 0630 **Pump Inlet Depth:** 30.68

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 2"

Purge Start Date/Time: 11/9/22 0640

Depth to Water - Initial (DTWi) (ft) 26.02

Purge End Date/Time: 11/9/22 0710

Depth to Well Bottom (ft) 38.62

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 23.33 - 38.03

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 30.68

Pump Start Time: 0640

Ferrous Iron (Required (Y) or N) 0.05 mg/L

2ND DTW - 26.02

APTIM

Sample Collection Log

Location ID: 67WW09A		Sample No: 67WW09A-221109								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0645	100	.5	26.10	3.71	21.06	6.78	31.7	127	0.66
	0650	100	1.0	26.16	4.37	20.15	6.47	27.4	79	0.19
	0655	100	1.5	26.20	4.74	19.79	6.34	24.9	64	0.05
	0700	100	2.0	26.23	4.75	19.74	6.33	24.4	63	0.05
	0705	100	2.5	26.25	4.75	19.69	6.36	23.7	62	0.04
	0710	100	3.0	26.28	4.76	19.65	6.32	23.2	61	0.04

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW10**

Sampler(s): Scott Baggenstoss

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW10-221109 **DATE/TIME:** 11/9/22 0716 **Pump Inlet Depth:** 37.46

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/9/22 0725

Depth to Water - Initial (DTWi) (ft) 24.59

Purge End Date/Time: 11/9/22 0755

Depth to Well Bottom (ft) 50.58

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.71-52.21

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~37.75~~ 37.46

Pump Start Time: 0725

Ferrous Iron (Required (Y) or N) 3.92 mg/L

2ND DTW- 24.59

APTIM

Sample Collection Log

Location ID: 67WW10		Sample No: 67WW10-221109								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0730	100	.5	24.67	4.86	20.34	6.91	128	47	0.68
	0735	100	1.0	24.73	5.06	19.72	5.61	125	77	0.22
	0740	100	1.5	24.76	5.10	19.40	5.42	125	90	0.04
	0745	100	2.0	24.78	5.11	19.34	5.41	124	91	0.03
	0750	100	2.5	24.80	5.12	19.30	5.40	123	91	0.03
↓	0755	100	3.0	24.81	5.12	19.26	5.39	122	92	0.03

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW11**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW11-221108 **DATE/TIME:** 11/8/22 0752 **Pump Inlet Depth:** 35.18

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/8/22 0800

Depth to Water - Initial (DTWi) (ft) 22.73

Purge End Date/Time: 11/8/22 0830

Depth to Well Bottom (ft) [redacted] 46.60

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 22.93 - 47.43

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): [redacted] 35.18

Pump Start Time: 0800

Ferrous Iron (Required (Y) or N) 0.08 mg/L

2nd DTW - 22.73

APTIM

Sample Collection Log

Location ID: 67WW11 Sample No: 67WW11-2211~~08~~

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22	0805	~~100~~	.5	22.80	4.55	20.47	6.49	4.7	185	0.74
	0810	~~100~~	1.0	22.86	4.66	20.09	6.35	1.6	191	0.33
	0815	~~100~~	1.5	22.90	4.70	20.00	6.28	0.7	195	0.07
	0820	~~100~~	2.0	22.92	4.71	19.96	6.28	0.0	196	0.06
	0825	~~100~~	2.5	22.94	4.72	19.92	6.27	0.0	196	0.06
	0830	~~100~~	3.0	22.95	4.72	19.88	6.27	0.0	196	0.06

QC'd by: _____ Date: _____

Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW12**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW12-221108 **DATE/TIME:** 11/8/22 1014 **Pump Inlet Depth:** 31.33

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/8/22 1020

Depth to Water - Initial (DTWi) (ft) 25.13

Purge End Date/Time: 11/8/22 1050

Depth to Well Bottom (ft) 36.18

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 26.58 - 36.08

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / N

Approximate depth of pump inlet*(ft): 31.33

Pump Start Time: 1020

Ferrous Iron (Required Y or N) 0.27 mg/L

2ND DTW - 25.13

APTIM

Sample Collection Log

Location ID: 67WW12		Sample No: 67WW12-221108								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22	1025	100	.5	25.20	3.99	20.59	7.23	4.6	32	0.70
	1030	100	1.0	25.26	4.34	20.10	6.59	2.1	67	0.35
	1035	100	1.5	25.40	4.45	19.97	6.30	1.1	74	0.16
	1040	100	2.0	25.42	4.46	19.93	6.29	0.5	75	0.16
	1045	100	2.5	25.44	4.47	19.87	6.28	0.0	75	0.16
↓	1050	100	3.0	25.46	4.48	19.83	6.27	0.0	76	0.15

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW13**

Sampler(s): Scott Beegle/Nolan

FIELD CONDITIONS

Cloudy

SAMPLING INFORMATION

Sample No: 67WW13-221104 **DATE/TIME:** 11/9/22 0956 **Pump Inlet Depth:** 21.75

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/9/22 0905

Depth to Water - Initial (DTWi) (ft) 21.05

Purge End Date/Time: 11/9/22 0935

Depth to Well Bottom (ft) [redacted] 28.53

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 12.57-27.07

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): [redacted] 21.75 Pump Start Time: 0905

Ferrous Iron (Required (Y) or N) 0.13 mg/L

2ND DTW - 21.05

APTIM

Sample Collection Log

Location ID: 67WW13		Sample No: 67WW13-221109								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0910	100	.5	21.03	4.63	20.23	6.65	3.3	86	1.07
	0915	100	1.0	21.19	4.85	20.28	6.49	1.2	92	0.75
	0920	100	1.5	21.23	4.93	20.30	6.41	0.6	102	0.71
	0925	100	2.0	21.26	4.94	20.32	6.40	0.0	103	0.70
	0930	100	2.5	21.29	4.94	20.34	6.40	0.0	103	0.69
↓	0935	100	3.0	21.31	4.95	20.36	6.40	0.0	103	0.69

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW13**

Sampler(s): Scott Beggingal

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW13-221109-MS **DATE/TIME:** 11/9/22 0956 **Pump Inlet Depth:** 21.75

Sampling Method: LF **Sample Purpose:** MS **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/9/22 0905

Depth to Water - Initial (DTWi) (ft) 21.05

Purge End Date/Time: 11/9/22 0935

Depth to Well Bottom (ft) ~~25~~ 28.53

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 12.57 - 27.07

Discharge Tube Diameter: 1/4"

Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~15~~ 21.75

Pump Start Time: 0905

Ferrous Iron (Required) (Y) or N) 0.13 mg/L

2ND DTW - 21.05

APTIM

Sample Collection Log

Location ID: 67WW13		Sample No: 67WW13-221109-MS								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0910	100	.5	21.13	4.63	20.23	6.65	3.3	86	1.07
	0915	100	1.0	21.19	4.85	20.28	6.49	1.2	92	0.75
	0920	100	1.5	21.23	4.93	20.30	6.41	0.6	102	0.71
	0925	100	2.0	21.26	4.94	20.32	6.40	0.0	103	0.70
	0930	100	2.5	21.29	4.94	20.34	6.40	0.0	103	0.69
↓	0935	100	3.0	21.31	4.95	20.36	6.40	0.0	103	0.69

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW13**

Sampler(s): Scott Beasinger

FIELD CONDITIONS

Cloudy

SAMPLING INFORMATION

Sample No: 67WW13-221109-MSD **DATE/TIME:** 11/9/22 0956 **Pump Inlet Depth:** 21.75

Sampling Method: LF **Sample Purpose:** MSD **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	Anions (chloride/nitrate/sulfate) in Water by SW9056	1 x 125 mL HPDE	Cool 4C
		ALSHT	Carbon Dioxide in Water by RSK175	3 x 40 mL Glass	Cool 4C
		ALSHT	Dissolved Gases in Water by RSK175	3 x 40 mL Glass	HCL<pH2
		ALSHT	TOC in Water by SM5310C	2 x 40 mL Amber	H2SO4
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/BLADDER Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/9/22 0905

Depth to Water - Initial (DTWi) (ft) 21.05

Purge End Date/Time: 11/9/22 0935

Depth to Well Bottom (ft) ~~28.5~~ 28.53

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 12.57 - 27.07

Discharge Tube Diameter: 1/4"

Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~18.5~~ 21.75

Pump Start Time: 0905

Ferrous Iron (Required (Y) or N) _____ mg/L

2ND DTW - 21.05

APTIM

Sample Collection Log

Location ID: 67WW13 Sample No: 67WW13-221109-MSD

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/9/22	0910	100	.5	21.13	4.63	20.23	6.65	3.3	86	1.07
	0915	100	1.0	21.19	4.85	20.28	6.49	1.2	92	0.75
	0920	100	1.5	21.23	4.93	20.30	6.41	0.6	102	0.71
	0925	100	2.0	21.26	4.94	20.32	6.40	0.0	103	0.70
	0930	100	2.5	21.29	4.94	20.34	6.40	0.0	103	0.69
	0935	100	3.0	21.31	4.95	20.36	6.40	0.0	103	0.69

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW14**

Sampler(s): Scott Baesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW14-221107 **DATE/TIME:** 11/07/22 0815 **Pump Inlet Depth:** 21.94

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample | **Assoc. QC Samples** | **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 2

Purge Start Date/Time: 11/7/22 0825

Depth to Water - Initial (DTWi) (ft) 19.45

Purge End Date/Time: 11/7/22 0855

Depth to Well Bottom (ft) 30.51

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 14.44 - 29.44

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 21.94 Pump Start Time: 0825

Ferrous Iron (Required (Y) or N) 0.51 mg/L

2ND DTW - 19.45

APTIM

Sample Collection Log

Location ID: 67WW14 Sample No: 67WW14-221107

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	0830	100	.5	19.52	1.88	21.10	4.98	12.7	76	0.74
	0835	100	1.0	19.58	1.87	21.39	5.45	8.0	90	0.20
	0840	100	1.5	19.62	1.87	21.43	5.62	4.1	85	0.04
	0845	100	2.0	19.65	1.87	21.46	5.63	1.8	84	0.04
	0850	100	2.5	19.67	1.87	21.50	5.64	0.5	83	0.03
↓	0855	100	3.0	19.69	1.87	21.54	5.65	0.0	83	0.03

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW15**

Sampler(s): Scott Beesinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW15-221108 **DATE/TIME:** 11/8/22 0620 **Pump Inlet Depth:** 41.68

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 4

Depth to Water - Initial (DTWi) (ft) 22.80

Depth to Well Bottom (ft) ~~47.36~~ 47.37

Screen Interval (ft): 36.78-46.48

Approximate depth of pump inlet*(ft): ~~36.86~~ 41.68

Ferrous Iron (Required (Y) or N) 0.06 mg/L

Purging Method/Equipment: Low flow/Bladder Pump

Purge Start Date/Time: 11/8/22 0630

Purge End Date/Time: 11/8/22 0700

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Pump Start Time: 0630

2ND DTW - @ 22.80

APTIM

Sample Collection Log

Location ID: 67WW15		Sample No: 67WW15-2211_08								
Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22	0635	100	.5	22.87	1.98	21.68	7.20	5.8	215	0.83
	0640	100	1.0	22.93	1.96	20.50	6.19	1.9	239	0.52
	0645	100	1.5	22.97	1.96	20.02	5.95	1.0	282	0.29
	0650	100	2.0	22.99	1.96	19.96	5.95	0.5	284	0.28
	0655	100	2.5	23.01	1.96	19.90	5.94	0.0	285	0.28
	0700	100	3.0	23.02	1.96	19.85	5.93	0.0	286	0.27

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW16I**

Sampler(s): Scott Bruninga

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW16I-221108 **DATE/TIME:** 11/8/22 0836 **Pump Inlet Depth:** 74.94

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/8/22 0850

Depth to Water - Initial (DTWi) (ft) 22.95

Purge End Date/Time: 11/8/22 0920

Depth to Well Bottom (ft) ~~80~~ 80.37

Discharge Tube Length: NA

PID Reading: NA

Screen Interval (ft): 70.09 - 79.79

Discharge Tube Diameter: 1/4"

Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~75~~ 74.94

Pump Start Time: 0850

Ferrous Iron (Required (Y) or N) 3.86 mg/L

2ND DTW - 22.95

APTIM

Sample Collection Log

Location ID: 67WW16I Sample No: 67WW16I-221108

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22	0855	100	.5	23.01	1.37	20.33	7.22	30.7	-18	0.79
	0900	100	1.0	23.05	1.40	19.91	6.08	27.4	-20	0.45
	0905	100	1.5	23.08	1.42	19.70	5.91	24.8	-25	0.17
	0910	100	2.0	23.10	1.43	19.65	5.90	24.2	-26	0.17
	0915	100	2.5	23.12	1.43	19.61	5.90	23.7	-27	0.16
	0920	100	3.0	23.13	1.43	19.57	5.89	23.3	-27	0.16

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW16I**

Sampler(s): Scott Beesinger

FIELD CONDITIONS

Cloudy

SAMPLING INFORMATION

Sample No: 67WW16I-2011~~08~~-FD **DATE/TIME:** 11/8/22 0836 **Pump Inlet Depth:** 74.94

Sampling Method: LF **Sample Purpose:** FD **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low flow/Bladder Pump

Casing ID (in.): 4

Purge Start Date/Time: 11/8/22 0850

Depth to Water - Initial (DTWi) (ft) 22.95

Purge End Date/Time: 11/8/22 0920

Depth to Well Bottom (ft) ~~80.1~~ 80.37

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 70.09 - 79.79

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): ~~75.55~~ 74.94

Pump Start Time: 0850

Ferrous Iron (Required (Y) or N) 3.86 mg/L

2ND DTW- 22.95

APTIM

Sample Collection Log

Location ID: 67WW16I Sample No: 67WW16I-20110[illegible]-FD

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/8/22	0855	100	.5	23.01	1.37	20.33	7.22	30.7	-18	0.79
	0900	100	1.0	23.05	1.40	19.91	6.08	27.4	-20	0.45
	0905	100	1.5	23.08	1.42	19.70	5.91	24.8	-25	0.17
	0910	100	2.0	23.10	1.43	19.65	5.90	24.2	-26	0.17
	0915	100	2.5	23.12	1.43	19.61	5.90	23.7	-27	0.16
↓	0920	100	3.0	23.13	1.43	19.57	5.89	23.3	-27	0.16

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW17**

Sampler(s): Scott Baggenger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW17-221107 **DATE/TIME:** 11/7/22 1036 **Pump Inlet Depth:** 25.40

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample **Assoc. QC Samples** **Decontamination Procedures**

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Casing ID (in.): 4"

Depth to Water - Initial (DTWi) (ft) 23.42

Depth to Well Bottom (ft) 29.94

Screen Interval (ft): 20.40 - 30.40

Approximate depth of pump inlet*(ft): 25.40

Ferrous Iron (Required Y or N) 0.09 mg/L

Purging Method/Equipment: Low Flow/Bladder Pump

Purge Start Date/Time: 11/7/22 1040

Purge End Date/Time: 11/7/22 1110

Discharge Tube Length: NA PID Reading: NA

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / N

Pump Start Time: 1040

2ND DTW- 23.42

APTIM

Sample Collection Log

Location ID: 67WW17 Sample No: 67WW17-221107

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	1045	100	.5	23.50	3.03	22.44	6.61	1.9	101	0.79
	1050	100	1.0	23.56	3.16	21.70	6.54	1.3	90	0.48
	1055	100	1.5	23.60	3.20	21.42	6.47	0.8	88	0.50
	1100	100	2.0	23.63	3.21	21.37	6.46	0.3	88	0.51
	1105	100	2.5	23.66	3.22	21.33	6.46	0.0	87	0.51
	1110	100	3.0	23.68	3.22	21.29	6.46	0.0	87	0.52

QC'd by: _____ Date: _____

APTIM

Sample Collection Log

Project Name: **Longhorn AAP**

Project No: **501032**

Location ID: **67WW18**

Sampler(s): Scott Bassinger

FIELD CONDITIONS Cloudy

SAMPLING INFORMATION

Sample No: 67WW18-221107 **DATE/TIME:** 11/7/22 0944 **Pump Inlet Depth:** 37.61

Sampling Method: LF **Sample Purpose:** REG **Sample Matrix:** GW

Appearance of Sample	Assoc. QC Samples	Decontamination Procedures

Chain of Custody	COC Notes	Lab	Analyses	Container	Preserv
		ALSHT	VOCs in Water by 8260C	3 x 40 mL Glass	HCL<pH2

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment: Low Flow/Bladder Pump

Casing ID (in.): 4"

Purge Start Date/Time: 11/7/22 0955

Depth to Water - Initial (DTWi) (ft) 22.42

Purge End Date/Time: 11/7/22 1025

Depth to Well Bottom (ft) 43.43

Discharge Tube Length: NA PID Reading: NA

Screen Interval (ft): 32.61 - 42.61

Discharge Tube Diameter: 1/4" Immiscible Layer: Y / (N)

Approximate depth of pump inlet*(ft): 37.61

Pump Start Time: 0955

Ferrous Iron (Required (Y) or N) 0.04 mg/L

2ND DTW - 22.42

APTIM

Sample Collection Log

Location ID: 67WW18 Sample No: 67WW18-221107

Date of Reading	Time of Reading	Purge Rate	Total Purge	DTW	Cond.	Temp.	pH	Turbidity	ORP	DO
		(ml/min)	(L)	(ft)	(mS/cm)	(°C)		(NTU)	(mV)	(mg/L)
	Purge Stabilization Criteria	-	-	Drawdown limit 0.3 ft	±10%		±0.1 units	No criteria		± 10% or 0.2 mg/L
11/7/22	1000	100	.5	22.50	1.37	21.26	6.70	4.1	45	0.72
	1005	100	1.0	22.56	1.33	21.63	6.49	2.2	64	0.35
	1010	100	1.5	22.60	1.28	21.88	6.39	1.0	80	0.29
	1015	100	2.0	22.62	1.28	21.92	6.38	0.5	81	0.28
	1020	100	2.5	22.64	1.27	21.96	6.38	0.0	81	0.27
	1025	100	3.0	22.66	1.27	22.00	6.38	0.0	82	0.27

QC'd by: _____ Date: _____

01190406

EQUIPMENT CALIBRATION DAILY LOG

Date: 11/7/22
Project Number: 501032
Project Name: LHAAP-67
Recorded By: Scott Bessinger

PID

Model:
Equipment ID #:
Bulb: 10.6 mev

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
First Point Calibration (Ambient Air)					Time:	Time:	Time:
					Initials:	Initials:	Initials:
	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	(Isobutylene)			Value:	Value:	Value:

COMB. GAS/O_2 METER

Model:
Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
First Point Calibration					Time:	Time:	Time:
					Initials:	Initials:	Initials:
	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model: YSI-52 HORIBA
Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
First Point Calibration (Ambient)					Time: 0800	Time:	Time:
					Initials: SB	Initials:	Initials:
	pH	4.06	AUG/23	ZGH1438	Value: 4.00	Value:	Value:
	Conductivity (mS/cm)	4.49			Value: 4.49	Value:	Value:
	Turbidity (NTU)	0			Value: 0.0	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value: 8.97	Value:	Value:
Second Point Calibration	pH	9.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 11/8/22

Project Number: 501032

Project Name: LHAAP 67

Recorded By: SCOTT BEESINGER

PID

Model:

Equipment ID #: Bulb: 10.6 mEV

	Parameter	Standard	Exp. Date	Lot#	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Time:	Time:	Time:
					Initials:	Initials:	Initials:
					Value:	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	(isobutylene)			Value:	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot#	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
First Point Calibration					Time:	Time:	Time:
	O2(%)				Initials:	Initials:	Initials:
					Value:	Value:	Value:
	%LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model: U-52 HORIBA

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot#	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
First Point Calibration (Acidic)					Time: 0600	Time:	Time:
					Initials: SB	Initials:	Initials:
	pH	4.00	AUG/23	2GH1738	Value: 4.00	Value:	Value:
	Conductivity (mS/cm)	4.49			Value: 4.49	Value:	Value:
	Turbidity (NTU)	0			Value: 0.0	Value:	Value:
	DO (mg/L)	8.8-9.1 (ambient air)	NA	NA	Value: 9.01	Value:	Value:
Second Point Calibration	pH	9.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.46			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

01190408

EQUIPMENT CALIBRATION DAILY LOG

Date: 11/9/22

Project Number: 501032

Project Name: LHAAP-67

Recorded By: Scott Bassingar

PID

Model:

Equipment ID #: Bulx 10.6 mev

	Parameter	Standard	Exp. Date	Lot#	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
First Point Calibration					Time:	Time:	Time:
					Initials:	Initials:	Initials:
	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	(isobutylene)			Value:	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot#	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
First Point Calibration					Time:	Time:	Time:
					Initials:	Initials:	Initials:
	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model: U-52 HORIBA

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot#	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
First Point Calibration (Auto)					Time: 0607	Time:	Time:
					Initials: SB	Initials:	Initials:
	pH	4.01	A06/23	2GH1438	Value: 4.00	Value:	Value:
	Conductivity (mS/cm)	4.49			Value: 4.49	Value:	Value:
	Turbidity (NTU)	0			Value: 0.0	Value:	Value:
	DO (mg/L)	8.5-9.1 (ambient air)	NA	NA	Value: 9.01	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	58.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	58.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

Groundwater Elevation Data, LHAAP-67

Well ID	Top of Casing Elevation	Ground Surface Elevation (ft MSL)	Depth to Water (ft from TOC)	Screen Interval (ft from TOC)		Screen Interval (ft MSL)		Ground Water Elevation (ft MSL)
				Top	Bottom	Top	Bottom	
67WW01 [c,d]	200.92	198.21	24.62	14.68	24.68	186.24	176.24	gauge and sample
67WW02 [c,d]	199.69	196.61	23.1	18.08	28.08	181.61	171.61	gauge and sample
67WW03 [c]	200.44	198.12	DRY	16.32	26.32	184.12	174.12	gauge and sample
67WW04 [a]	203.76	200.05	DRY	14.71	24.71	189.05	179.05	gauge only
67WW05 [a]	201	197.48	24.30	19.52	29.52	181.48	171.48	gauge and sample
67WW06 [a]	200.81	196.95	24.00	41.86	51.86	158.95	148.95	gauge only
67WW07 [a]	200.84	197.04	24.02	17.8	27.8	183.04	173.04	gauge and sample
67WW08 [b,d]	200.02	197.60	23.15	26.02	50.52	174	149.5	gauge and sample
67WW09 [b]	198.21	195.72	21.78	16.99	36.49	181.22	161.72	gauge and sample
67WW09A [b]	202.93	200.4	26.02	23.33	38.03	179.6	164.9	gauge and sample
67WW10 [b]	201.51	198.8	24.59	22.71	52.21	178.8	149.3	gauge and sample
67WW11 [b]	199.64	197.21	22.73	22.93	47.43	176.71	152.21	gauge and sample
67WW12 [b]	201.65	199.07	25.13	26.58	36.08	175.07	165.57	gauge and sample
67WW13	197.92	195.85	21.05	12.57	27.07	185.35	170.85	gauge and sample
67WW14	196.96	194.52	19.45	14.44	29.44	182.52	167.52	gauge and sample
67WW15	199.82	197.24	22.8	36.78	46.48	163.04	153.34	gauge and sample
67WW16I [e]	199.51	197.12	22.95	70.09	79.79	129.42	119.72	gauge and sample
67WW17	199.73	196.33	23.42	20.4	30.4	NA	NA	gauge and sample
67WW18	198.9	195.29	22.42	32.61	42.61	NA	NA	gauge and sample

Notes:

Elevations are reported as feet above mean sea level (ft MSL).

[a] Screen information calculated from Data Gap Investigation Report (Shaw 2007).

[b] Screen information calculated from well construction detail forms.

[c] Well screen top and bottom depths and elevations for monitoring wells 67WW01, 67WW02, and 67WW03 were revised/confirmed with a downhole camera survey performed

[d] Monitoring wells 67WW01, 67WW02, and 67WW08 were re-surveyed in September 2016 and elevations in the table for these wells are based on the re-survey results.

[e] Intermediate zone monitoring well

Dry - insufficient or no water in well

ft - feet

MSL - mean sea level

TOC - top of casing

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • September 2023

Appendix C

Laboratory Analytical Data Package

(Provided electronically on compact disc and the Portal)

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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November 15, 2022

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22110553**

Laboratory Results for: **LHAAP 67 November 2022**

Dear Vicki Graves ,

ALS Environmental received 14 sample(s) on Nov 09, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Work Order: HS22110553

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22110553-01	67WW14-221107	GW		07-Nov-2022 08:55	09-Nov-2022 09:15	☐
HS22110553-02	67WW05-221107	GW		07-Nov-2022 09:35	09-Nov-2022 09:15	☐
HS22110553-03	67WW18-221107	GW		07-Nov-2022 10:25	09-Nov-2022 09:15	☐
HS22110553-04	67WW17-221107	GW		07-Nov-2022 11:10	09-Nov-2022 09:15	☐
HS22110553-05	67WW02-221107	GW		07-Nov-2022 12:10	09-Nov-2022 09:15	☐
HS22110553-06	67WW15-221108	GW		08-Nov-2022 07:00	09-Nov-2022 09:15	☐
HS22110553-07	67WW09-221108	GW		08-Nov-2022 07:45	09-Nov-2022 09:15	☐
HS22110553-08	67WW11-221108	GW		08-Nov-2022 08:30	09-Nov-2022 09:15	☐
HS22110553-09	67WW16I-221108	GW		08-Nov-2022 09:20	09-Nov-2022 09:15	☐
HS22110553-10	67WW16I-221108-FD	GW		08-Nov-2022 09:20	09-Nov-2022 09:15	☐
HS22110553-11	67WW01-221108	GW		08-Nov-2022 10:05	09-Nov-2022 09:15	☐
HS22110553-12	67WW12-221108	GW		08-Nov-2022 10:50	09-Nov-2022 09:15	☐
HS22110553-13	67WW07-221108	GW		08-Nov-2022 11:35	09-Nov-2022 09:15	☐
HS22110553-14	Trip Blank-221108	Water		08-Nov-2022 00:00	09-Nov-2022 09:15	☐

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 67 November 2022
Work Order: HS22110553

GCMS Volatiles by Method SW8260

Batch ID: R421680

Sample ID: 67WW05-221107 (HS22110553-02)

- Surrogate Dibromofluoromethane exceeded recovery limits. Sample is ND.

Sample ID: 67WW16I-221108-FD (HS22110553-10)

- Surrogate Dibromofluoromethane exceeded recovery limits. Sample is ND.

Sample ID: HS22110430-06MS

- MS and MSD are for an unrelated sample

Batch ID: R421783

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW14-221107 Lab ID:HS22110553-01
Collection Date: 07-Nov-2022 08:55 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,1-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 16:42
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:42
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 16:42
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 16:42
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:42
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 16:42
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW14-221107
Collection Date: 07-Nov-2022 08:55

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:42
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:42
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 16:42*
Surr: 4-Bromofluorobenzene	*99.8*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 16:42*
Surr: Dibromofluoromethane	*118*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 16:42*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 16:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW05-221107
Collection Date: 07-Nov-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:02
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 17:02
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 17:02
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:02
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 17:02
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW05-221107 Lab ID:HS22110553-02
Collection Date: 07-Nov-2022 09:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:02
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:02
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 17:02*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 17:02*
Surr: Dibromofluoromethane	*119*	*S*		**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 17:02*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 17:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW18-221107
Collection Date: 07-Nov-2022 10:25

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:23
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 17:23
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 17:23
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:23
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 17:23
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW18-221107 Lab ID:HS22110553-03
Collection Date: 07-Nov-2022 10:25 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:23
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:23
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 17:23*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 17:23*
Surr: Dibromofluoromethane	*117*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 17:23*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 17:23*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW17-221107 Lab ID:HS22110553-04
Collection Date: 07-Nov-2022 11:10 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:43
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 17:43
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 17:43
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:43
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 17:43
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW17-221107 Lab ID:HS22110553-04
Collection Date: 07-Nov-2022 11:10 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:43
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:43
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 17:43*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 17:43*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 17:43*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 17:43*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW02-221107 Lab ID:HS22110553-05
Collection Date: 07-Nov-2022 12:10 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1-Dichloroethane	**4.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:07
1,1-Dichloroethene	**100**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:07
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:07
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 20:07
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 20:07
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:07
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 20:07
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW02-221107 Lab ID:HS22110553-05
Collection Date: 07-Nov-2022 12:10 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:07
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:07
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 20:07*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 20:07*
Surr: Dibromofluoromethane	*114*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 20:07*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 20:07*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW15-221108 Lab ID:HS22110553-06
Collection Date: 08-Nov-2022 07:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,1,2-Trichloroethane	**3.2**		**0.30**	**1.0**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
1,1-Dichloroethane	**9.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
1,1-Dichloroethene	**640**		**2.0**	**5.0**	**10**	**ug/L**	10	14-Nov-2022 13:10
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dichloroethane	**24**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:47
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 20:47
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 20:47
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:47
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 20:47
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW15-221108 Lab ID:HS22110553-06
Collection Date: 08-Nov-2022 07:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
cis-1,2-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:47
Methylene chloride	**3.3**		**0.40**	**2.0**	**2.0**	**ug/L**	1	13-Nov-2022 20:47
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Trichloroethene	**1.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*10*	*14-Nov-2022 13:10*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*10*	*14-Nov-2022 13:10*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: Dibromofluoromethane	*118*			**0**	*80-119*	*%REC*	*10*	*14-Nov-2022 13:10*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*14-Nov-2022 13:10*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW09-221108
Collection Date: 08-Nov-2022 07:45

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-07
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:04
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 18:04
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 18:04
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:04
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 18:04
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW09-221108 Lab ID:HS22110553-07
Collection Date: 08-Nov-2022 07:45 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:04
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:04
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 18:04*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 18:04*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 18:04*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 18:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW11-221108 Lab ID:HS22110553-08
Collection Date: 08-Nov-2022 08:30 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:24
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 18:24
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 18:24
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:24
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 18:24
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW11-221108
Collection Date: 08-Nov-2022 08:30

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-08
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:24
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:24
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 18:24*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 18:24*
Surr: Dibromofluoromethane	*115*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 18:24*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 18:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW16I-221108
Collection Date: 08-Nov-2022 09:20

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-09
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:45
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 18:45
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 18:45
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:45
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 18:45
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW16I-221108 Lab ID:HS22110553-09
Collection Date: 08-Nov-2022 09:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:45
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:45
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 18:45*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 18:45*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 18:45*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 18:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW16I-221108-FD Lab ID:HS22110553-10
Collection Date: 08-Nov-2022 09:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:05
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 19:05
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 19:05
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:05
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 19:05
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW16I-221108-FD Lab ID:HS22110553-10
Collection Date: 08-Nov-2022 09:20 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:05
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:05
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 19:05*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 19:05*
Surr: Dibromofluoromethane	*122*	*S*		**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 19:05*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 19:05*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW01-221108
Collection Date: 08-Nov-2022 10:05

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-11
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 19:26
1,1-Dichloroethene	**36**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 19:26
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dichloroethane	**3.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 19:26
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:26
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 19:26
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 19:26
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:26
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 19:26
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW01-221108
Collection Date: 08-Nov-2022 10:05

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-11
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:26
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:26
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 19:26*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 19:26*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 19:26*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 19:26*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW12-221108 Lab ID:HS22110553-12
Collection Date: 08-Nov-2022 10:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,1-Dichloroethene	**40**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:27
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:27
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 20:27
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 20:27
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:27
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 20:27
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW12-221108 Lab ID:HS22110553-12
Collection Date: 08-Nov-2022 10:50 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:27
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:27
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 20:27*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 20:27*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 20:27*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 20:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW07-221108 Lab ID:HS22110553-13
Collection Date: 08-Nov-2022 11:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:46
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 19:46
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 19:46
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:46
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 19:46
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW07-221108 Lab ID:HS22110553-13
Collection Date: 08-Nov-2022 11:35 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:46
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:46
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 19:46*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 19:46*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 19:46*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 19:46*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: Trip Blank-221108 Lab ID:HS22110553-14
Collection Date: 08-Nov-2022 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:01
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 16:01
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 16:01
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:01
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 16:01
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: Trip Blank-221108
Collection Date: 08-Nov-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-14
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:01
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:01
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 16:01*
Surr: 4-Bromofluorobenzene	*98.8*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 16:01*
Surr: Dibromofluoromethane	*118*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 16:01*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 16:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R421680 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22110553-14	Trip Blank-221108	08 Nov 2022 00:00			13 Nov 2022 16:01	1
Batch ID: R421680 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS22110553-01	67WW14-221107	07 Nov 2022 08:55			13 Nov 2022 16:42	1
HS22110553-02	67WW05-221107	07 Nov 2022 09:35			13 Nov 2022 17:02	1
HS22110553-03	67WW18-221107	07 Nov 2022 10:25			13 Nov 2022 17:23	1
HS22110553-04	67WW17-221107	07 Nov 2022 11:10			13 Nov 2022 17:43	1
HS22110553-05	67WW02-221107	07 Nov 2022 12:10			13 Nov 2022 20:07	1
HS22110553-06	67WW15-221108	08 Nov 2022 07:00			13 Nov 2022 20:47	1
HS22110553-07	67WW09-221108	08 Nov 2022 07:45			13 Nov 2022 18:04	1
HS22110553-08	67WW11-221108	08 Nov 2022 08:30			13 Nov 2022 18:24	1
HS22110553-09	67WW16I-221108	08 Nov 2022 09:20			13 Nov 2022 18:45	1
HS22110553-10	67WW16I-221108-FD	08 Nov 2022 09:20			13 Nov 2022 19:05	1
HS22110553-11	67WW01-221108	08 Nov 2022 10:05			13 Nov 2022 19:26	1
HS22110553-12	67WW12-221108	08 Nov 2022 10:50			13 Nov 2022 20:27	1
HS22110553-13	67WW07-221108	08 Nov 2022 11:35			13 Nov 2022 19:46	1
Batch ID: R421783 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS22110553-06	67WW15-221108	08 Nov 2022 07:00			14 Nov 2022 13:10	10

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 13:17**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
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QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 13:17**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	1.0	1.0								U
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*54.85*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49*	*1.0*	*50*	*0*	*98.0*	*85 - 114*				
Surr: Dibromofluoromethane	*56.53*	*1.0*	*50*	*0*	*113*	*80 - 119*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 13:17**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.11*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument: VOA10** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 12:36**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978295** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.57	1.0	20	0	92.9	78 - 124				
1,1,1-Trichloroethane	20	1.0	20	0	100	74 - 131				
1,1,2,2-Tetrachloroethane	19.76	1.0	20	0	98.8	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	17.16	1.0	20	0	85.8	70 - 136				
1,1,2-Trichloroethane	19.49	1.0	20	0	97.4	80 - 119				
1,1-Dichloroethane	24.53	1.0	20	0	123	77 - 125				
1,1-Dichloroethene	16.37	1.0	20	0	81.8	71 - 131				
1,1-Dichloropropene	20.52	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	19.76	1.0	20	0	98.8	69 - 129				
1,2,3-Trichloropropane	16.54	1.0	20	0	82.7	73 - 122				
1,2,4-Trichlorobenzene	19.86	1.0	20	0	99.3	69 - 130				
1,2,4-Trimethylbenzene	18.25	1.0	20	0	91.3	76 - 124				
1,2-Dibromo-3-chloropropane	18.06	1.0	20	0	90.3	62 - 128				
1,2-Dibromoethane	18.99	1.0	20	0	94.9	77 - 121				
1,2-Dichlorobenzene	19.97	1.0	20	0	99.8	80 - 119				
1,2-Dichloroethane	20.31	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	20.37	1.0	20	0	102	78 - 122				
1,3,5-Trimethylbenzene	18.25	1.0	20	0	91.2	75 - 124				
1,3-Dichlorobenzene	17.66	1.0	20	0	88.3	80 - 119				
1,3-Dichloropropane	19.94	1.0	20	0	99.7	80 - 119				
1,4-Dichlorobenzene	20.19	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	21.85	1.0	20	0	109	60 - 139				
2-Butanone	41.04	2.0	40	0	103	56 - 143				
2-Chlorotoluene	19.98	1.0	20	0	99.9	79 - 122				
2-Hexanone	40.34	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.77	1.0	20	0	93.8	78 - 122				
4-Isopropyltoluene	17.4	1.0	20	0	87.0	77 - 127				
4-Methyl-2-pentanone	37.85	2.0	40	0	94.6	67 - 130				
Acetone	28.42	2.0	40	0	71.0	39 - 160				
Benzene	20	1.0	20	0	100.0	79 - 120				
Bromobenzene	19.48	1.0	20	0	97.4	80 - 120				
Bromochloromethane	23.01	1.0	20	0	115	78 - 123				
Bromodichloromethane	19.67	1.0	20	0	98.3	79 - 125				
Bromoform	19.64	1.0	20	0	98.2	66 - 130				

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Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
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QC BATCH REPORT

Batch ID: R421680 (0) **Instrument: VOA10** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 12:36**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978295** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	17.52	1.0	20	0	87.6	53 - 141				
Carbon disulfide	32.48	2.0	40	0	81.2	64 - 133				
Carbon tetrachloride	19.36	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.91	1.0	20	0	89.6	82 - 118				
Chloroethane	19.44	1.0	20	0	97.2	60 - 138				
Chloroform	20.27	1.0	20	0	101	79 - 124				
Chloromethane	20.9	1.0	20	0	104	50 - 139				
cis-1,2-Dichloroethene	21.45	1.0	20	0	107	78 - 123				
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	75 - 124				
Dibromochloromethane	18.83	1.0	20	0	94.1	74 - 126				
Dibromomethane	19.92	1.0	20	0	99.6	79 - 123				
Dichlorodifluoromethane	19.6	1.0	20	0	98.0	32 - 152				
Ethylbenzene	18.12	1.0	20	0	90.6	79 - 121				
Hexachlorobutadiene	23.48	1.0	20	0	117	66 - 134				
Isopropylbenzene	17.14	1.0	20	0	85.7	72 - 131				
m,p-Xylene	36.9	2.0	40	0	92.3	80 - 121				
Methylene chloride	16.36	2.0	20	0	81.8	74 - 124				
Naphthalene	18.5	1.0	20	0	92.5	61 - 128				
n-Butylbenzene	17.29	1.0	20	0	86.4	75 - 128				
n-Propylbenzene	18.47	1.0	20	0	92.3	76 - 126				
o-Xylene	18.8	1.0	20	0	94.0	78 - 122				
sec-Butylbenzene	16.97	1.0	20	0	84.9	77 - 126				
Styrene	17.97	1.0	20	0	89.9	78 - 123				
tert-Butylbenzene	16.99	1.0	20	0	84.9	78 - 124				
Tetrachloroethene	18.18	1.0	20	0	90.9	74 - 129				
Toluene	19.56	1.0	20	0	97.8	80 - 121				
trans-1,2-Dichloroethene	20.88	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	19.72	1.0	20	0	98.6	73 - 127				
Trichloroethene	19.74	1.0	20	0	98.7	79 - 123				
Trichlorofluoromethane	18.67	1.0	20	0	93.4	65 - 141				
Vinyl chloride	18.43	1.0	20	0	92.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.46*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.45*	*1.0*	*50*	*0*	*96.9*	*85 - 114*				
Surr: Dibromofluoromethane	*54.85*	*1.0*	*50*	*0*	*110*	*80 - 119*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 12:36**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978295** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.17*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument: VOA10** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS22110430-06MS** Units: **ug/L** Analysis Date: **13-Nov-2022 13:58**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978298** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	101.8	5.0	100	0	102	78 - 124				
1,1,1-Trichloroethane	122	5.0	100	0	122	74 - 131				
1,1,2,2-Tetrachloroethane	98.04	5.0	100	0	98.0	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	192.7	5.0	100	0	193	70 - 136				S
1,1,2-Trichloroethane	103.1	5.0	100	0	103	80 - 119				
1,1-Dichloroethane	85.89	5.0	100	0	85.9	77 - 125				
1,1-Dichloroethene	154.3	5.0	100	0	154	71 - 131				S
1,1-Dichloropropene	132.5	5.0	100	0	133	78 - 125				S
1,2,3-Trichlorobenzene	105.1	5.0	100	0	105	69 - 129				
1,2,3-Trichloropropane	87.69	5.0	100	0	87.7	73 - 122				
1,2,4-Trichlorobenzene	107.7	5.0	100	0	108	69 - 130				
1,2,4-Trimethylbenzene	107.9	5.0	100	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	89.85	5.0	100	0	89.8	62 - 128				
1,2-Dibromoethane	100.4	5.0	100	0	100	77 - 121				
1,2-Dichlorobenzene	106.4	5.0	100	0	106	80 - 119				
1,2-Dichloroethane	102.7	5.0	100	0	103	73 - 128				
1,2-Dichloropropane	105.3	5.0	100	0	105	78 - 122				
1,3,5-Trimethylbenzene	115.4	5.0	100	0	115	75 - 124				
1,3-Dichlorobenzene	101	5.0	100	0	101	80 - 119				
1,3-Dichloropropane	105.4	5.0	100	0	105	80 - 119				
1,4-Dichlorobenzene	111.2	5.0	100	0	111	79 - 118				
2,2-Dichloropropane	129.1	5.0	100	0	129	60 - 139				
2-Butanone	191	10	200	0	95.5	56 - 143				
2-Chlorotoluene	115.2	5.0	100	0	115	79 - 122				
2-Hexanone	199.7	10	200	0	99.9	57 - 139				
4-Chlorotoluene	109.4	5.0	100	0	109	78 - 122				
4-Isopropyltoluene	117.4	5.0	100	0	117	77 - 127				
4-Methyl-2-pentanone	189.8	10	200	0	94.9	67 - 130				
Acetone	243.5	10	200	0	122	39 - 160				
Benzene	112.2	5.0	100	0	112	79 - 120				
Bromobenzene	103.7	5.0	100	0	104	80 - 120				
Bromochloromethane	116	5.0	100	0	116	78 - 123				
Bromodichloromethane	107.2	5.0	100	0	107	79 - 125				
Bromoform	100.8	5.0	100	0	101	66 - 130				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110430-06MS** Units: **ug/L** Analysis Date: **13-Nov-2022 13:58**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978298** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	86.95	5.0	100	0	86.9	53 - 141				
Carbon disulfide	296.9	10	200	0	148	64 - 133				S
Carbon tetrachloride	131.2	5.0	100	0	131	72 - 136				
Chlorobenzene	105.5	5.0	100	0	105	82 - 118				
Chloroethane	118.8	5.0	100	0	119	60 - 138				
Chloroform	107.9	5.0	100	0	108	79 - 124				
Chloromethane	104.9	5.0	100	0	105	50 - 139				
cis-1,2-Dichloroethene	117.6	5.0	100	0	118	78 - 123				
cis-1,3-Dichloropropene	107.7	5.0	100	0	108	75 - 124				
Dibromochloromethane	100.4	5.0	100	0	100	74 - 126				
Dibromomethane	102.1	5.0	100	0	102	79 - 123				
Dichlorodifluoromethane	102.9	5.0	100	0	103	32 - 152				
Ethylbenzene	114.9	5.0	100	0	115	79 - 121				
Hexachlorobutadiene	149.1	5.0	100	0	149	66 - 134				S
Isopropylbenzene	115.9	5.0	100	0	116	72 - 131				
m,p-Xylene	233.4	10	200	0	117	80 - 121				
Methylene chloride	136.3	10	100	0	136	74 - 124				S
Naphthalene	91	5.0	100	0	91.0	61 - 128				
n-Butylbenzene	115.3	5.0	100	0	115	75 - 128				
n-Propylbenzene	121.3	5.0	100	0	121	76 - 126				
o-Xylene	111.8	5.0	100	0	112	78 - 122				
sec-Butylbenzene	117.5	5.0	100	0	118	77 - 126				
Styrene	107.1	5.0	100	0	107	78 - 123				
tert-Butylbenzene	114.7	5.0	100	0	115	78 - 124				
Tetrachloroethene	128.7	5.0	100	0	129	74 - 129				
Toluene	117.1	5.0	100	0	117	80 - 121				
trans-1,2-Dichloroethene	115.2	5.0	100	2.07	113	75 - 124				
trans-1,3-Dichloropropene	102.2	5.0	100	0	102	73 - 127				
Trichloroethene	442.2	5.0	100	355.5	86.7	79 - 123				
Trichlorofluoromethane	106.1	5.0	100	0	106	65 - 141				
Vinyl chloride	109.1	5.0	100	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*255.6*	*5.0*	*250*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*253.3*	*5.0*	*250*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*263.1*	*5.0*	*250*	*0*	*105*	*80 - 119*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110430-06MS** Units: **ug/L** Analysis Date: **13-Nov-2022 13:58**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978298** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*271.6*	*5.0*	*250*	*0*	*109*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument: VOA10** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS22110430-06MSD** Units: **ug/L** Analysis Date: **13-Nov-2022 14:18**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978299** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	99.76	5.0	100	0	99.8	78 - 124	101.8	1.99	20	
1,1,1-Trichloroethane	118.3	5.0	100	0	118	74 - 131	122	3.06	20	
1,1,2,2-Tetrachloroethane	100.2	5.0	100	0	100	71 - 121	98.04	2.17	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	185.1	5.0	100	0	185	70 - 136	192.7	4.03	20	S
1,1,2-Trichloroethane	102.8	5.0	100	0	103	80 - 119	103.1	0.247	20	
1,1-Dichloroethane	93.24	5.0	100	0	93.2	77 - 125	85.89	8.2	20	
1,1-Dichloroethene	146.4	5.0	100	0	146	71 - 131	154.3	5.27	20	S
1,1-Dichloropropene	127.1	5.0	100	0	127	78 - 125	132.5	4.16	20	S
1,2,3-Trichlorobenzene	103.4	5.0	100	0	103	69 - 129	105.1	1.6	20	
1,2,3-Trichloropropane	91.63	5.0	100	0	91.6	73 - 122	87.69	4.4	20	
1,2,4-Trichlorobenzene	106.4	5.0	100	0	106	69 - 130	107.7	1.28	20	
1,2,4-Trimethylbenzene	106.2	5.0	100	0	106	76 - 124	107.9	1.59	20	
1,2-Dibromo-3-chloropropane	95.32	5.0	100	0	95.3	62 - 128	89.85	5.91	20	
1,2-Dibromoethane	101.1	5.0	100	0	101	77 - 121	100.4	0.661	20	
1,2-Dichlorobenzene	105.4	5.0	100	0	105	80 - 119	106.4	0.964	20	
1,2-Dichloroethane	106.6	5.0	100	0	107	73 - 128	102.7	3.67	20	
1,2-Dichloropropane	109.7	5.0	100	0	110	78 - 122	105.3	4.09	20	
1,3,5-Trimethylbenzene	109.8	5.0	100	0	110	75 - 124	115.4	4.97	20	
1,3-Dichlorobenzene	97.16	5.0	100	0	97.2	80 - 119	101	3.86	20	
1,3-Dichloropropane	102.1	5.0	100	0	102	80 - 119	105.4	3.22	20	
1,4-Dichlorobenzene	108.2	5.0	100	0	108	79 - 118	111.2	2.7	20	
2,2-Dichloropropane	124	5.0	100	0	124	60 - 139	129.1	4	20	
2-Butanone	211.3	10	200	0	106	56 - 143	191	10.1	20	
2-Chlorotoluene	111.2	5.0	100	0	111	79 - 122	115.2	3.52	20	
2-Hexanone	195.9	10	200	0	97.9	57 - 139	199.7	1.94	20	
4-Chlorotoluene	105.5	5.0	100	0	106	78 - 122	109.4	3.62	20	
4-Isopropyltoluene	112	5.0	100	0	112	77 - 127	117.4	4.72	20	
4-Methyl-2-pentanone	185.6	10	200	0	92.8	67 - 130	189.8	2.27	20	
Acetone	260.2	10	200	0	130	39 - 160	243.5	6.6	20	
Benzene	110.6	5.0	100	0	111	79 - 120	112.2	1.47	20	
Bromobenzene	101.6	5.0	100	0	102	80 - 120	103.7	2.09	20	
Bromochloromethane	119.9	5.0	100	0	120	78 - 123	116	3.29	20	
Bromodichloromethane	104.8	5.0	100	0	105	79 - 125	107.2	2.23	20	
Bromoform	96.63	5.0	100	0	96.6	66 - 130	100.8	4.22	20	

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument: VOA10** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS22110430-06MSD** Units: **ug/L** Analysis Date: **13-Nov-2022 14:18**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978299** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	89.44	5.0	100	0	89.4	53 - 141	86.95	2.83	20	
Carbon disulfide	269.6	10	200	0	135	64 - 133	296.9	9.66	20	S
Carbon tetrachloride	121.9	5.0	100	0	122	72 - 136	131.2	7.38	20	
Chlorobenzene	99.87	5.0	100	0	99.9	82 - 118	105.5	5.47	20	
Chloroethane	110.9	5.0	100	0	111	60 - 138	118.8	6.81	20	
Chloroform	105.7	5.0	100	0	106	79 - 124	107.9	2.04	20	
Chloromethane	109.4	5.0	100	0	109	50 - 139	104.9	4.26	20	
cis-1,2-Dichloroethene	116.5	5.0	100	0	116	78 - 123	117.6	0.902	20	
cis-1,3-Dichloropropene	109.4	5.0	100	0	109	75 - 124	107.7	1.58	20	
Dibromochloromethane	98.07	5.0	100	0	98.1	74 - 126	100.4	2.38	20	
Dibromomethane	98.64	5.0	100	0	98.6	79 - 123	102.1	3.48	20	
Dichlorodifluoromethane	99.86	5.0	100	0	99.9	32 - 152	102.9	2.95	20	
Ethylbenzene	108.5	5.0	100	0	108	79 - 121	114.9	5.79	20	
Hexachlorobutadiene	146.6	5.0	100	0	147	66 - 134	149.1	1.69	20	S
Isopropylbenzene	109.7	5.0	100	0	110	72 - 131	115.9	5.42	20	
m,p-Xylene	216.8	10	200	0	108	80 - 121	233.4	7.38	20	
Methylene chloride	136.5	10	100	0	136	74 - 124	136.3	0.167	20	S
Naphthalene	92.31	5.0	100	0	92.3	61 - 128	91	1.43	20	
n-Butylbenzene	112.2	5.0	100	0	112	75 - 128	115.3	2.78	20	
n-Propylbenzene	114.8	5.0	100	0	115	76 - 126	121.3	5.52	20	
o-Xylene	107.3	5.0	100	0	107	78 - 122	111.8	4.06	20	
sec-Butylbenzene	113.3	5.0	100	0	113	77 - 126	117.5	3.67	20	
Styrene	102.5	5.0	100	0	102	78 - 123	107.1	4.37	20	
tert-Butylbenzene	109.9	5.0	100	0	110	78 - 124	114.7	4.27	20	
Tetrachloroethene	118.2	5.0	100	0	118	74 - 129	128.7	8.49	20	
Toluene	111	5.0	100	0	111	80 - 121	117.1	5.39	20	
trans-1,2-Dichloroethene	112.3	5.0	100	2.07	110	75 - 124	115.2	2.56	20	
trans-1,3-Dichloropropene	100.5	5.0	100	0	100	73 - 127	102.2	1.75	20	
Trichloroethene	429	5.0	100	355.5	73.4	79 - 123	442.2	3.04	20	S
Trichlorofluoromethane	119.6	5.0	100	0	120	65 - 141	106.1	12	20	
Vinyl chloride	109.6	5.0	100	0	110	58 - 137	109.1	0.373	20	
Surr: 1,2-Dichloroethane-d4	*266.3*	*5.0*	*250*	*0*	*107*	*81 - 118*	*255.6*	*4.1*	*20*	
Surr: 4-Bromofluorobenzene	*249.6*	*5.0*	*250*	*0*	*99.8*	*85 - 114*	*253.3*	*1.45*	*20*	
Surr: Dibromofluoromethane	*263*	*5.0*	*250*	*0*	*105*	*80 - 119*	*263.1*	*0.045*	*20*	

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110430-06MSD** Units: **ug/L** Analysis Date: **13-Nov-2022 14:18**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978299** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*269.4*	*5.0*	*250*	*0*	*108*	*89 - 112*	*271.6*	*0.823*	*20*	

The following samples were analyzed in this batch:

HS22110553-01	HS22110553-02	HS22110553-03	HS22110553-04
HS22110553-05	HS22110553-06	HS22110553-07	HS22110553-08
HS22110553-09	HS22110553-10	HS22110553-11	HS22110553-12
HS22110553-13	HS22110553-14		

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421783 (0) **Instrument: VOA10** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-221114** Units: **ug/L** Analysis Date: **14-Nov-2022 12:49**
Client ID: Run ID: **VOA10_421783** SeqNo: **6980435** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*57.91*	*1.0*	*50*	*0*	*116*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.11*	*1.0*	*50*	*0*	*98.2*	*85 - 114*				
Surr: Dibromofluoromethane	*59.03*	*1.0*	*50*	*0*	*118*	*80 - 119*				
Surr: Toluene-d8	*53.16*	*1.0*	*50*	*0*	*106*	*89 - 112*				

LCS Sample ID: **VLCSW-221114** Units: **ug/L** Analysis Date: **14-Nov-2022 12:08**
Client ID: Run ID: **VOA10_421783** SeqNo: **6980434** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	24.18	1.0	20	0	121	71 - 131				
Surr: 1,2-Dichloroethane-d4	*56.43*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.62*	*1.0*	*50*	*0*	*97.2*	*85 - 114*				
Surr: Dibromofluoromethane	*55.23*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*54.08*	*1.0*	*50*	*0*	*108*	*89 - 112*				

MS Sample ID: **HS22110553-06MS** Units: **ug/L** Analysis Date: **14-Nov-2022 13:30**
Client ID: **67WW15-221108** Run ID: **VOA10_421783** SeqNo: **6980437** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	843.5	10	200	644.9	99.3	71 - 131				
Surr: 1,2-Dichloroethane-d4	*519.9*	*10*	*500*	*0*	*104*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*497.2*	*10*	*500*	*0*	*99.4*	*85 - 114*				
Surr: Dibromofluoromethane	*532.5*	*10*	*500*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*542.5*	*10*	*500*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421783 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110553-06MSD** Units: **ug/L** Analysis Date: **14-Nov-2022 13:51**
Client ID: **67WW15-221108** Run ID: **VOA10_421783** SeqNo: **6980438** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	840.4	10	200	644.9	97.7	71 - 131	843.5	0.367	20	
Surr: 1,2-Dichloroethane-d4	*509.4*	*10*	*500*	*0*	*102*	*81 - 118*	*519.9*	*2.05*	*20*	
Surr: 4-Bromofluorobenzene	*488.8*	*10*	*500*	*0*	*97.8*	*85 - 114*	*497.2*	*1.7*	*20*	
Surr: Dibromofluoromethane	*535.2*	*10*	*500*	*0*	*107*	*80 - 119*	*532.5*	*0.51*	*20*	
Surr: Toluene-d8	*552*	*10*	*500*	*0*	*110*	*89 - 112*	*542.5*	*1.74*	*20*	

The following samples were analyzed in this batch: HS22110553-06

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: **HS22110553**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 15-Nov-22

Sample Receipt Checklist

Work Order ID: HS22110553 **Date/Time Received:** 09-Nov-2022 09:15

Client Name: CBI-Houston **Received by:** Nelson D. Dusara

Completed By: /S/ Ragen Giga (eSignature) 09-Nov-2022 16:02 (Date/Time) **Reviewed by:** /S/ Dane J. Wacasey (eSignature) 15-Nov-2022 11:05 (Date/Time)

Matrices: GW Carrier name: FedEx Priority Overnight

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:Client
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.1uc/1.6c	IR 31
Cooler(s)/Kit(s):	49303	
Date/Time sample(s) sent to storage:	11/09/2022 16:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 575-2190 ATTN: Dane Wacasey

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 67 November 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22110553
Aptim Environmental & Infrastucture, Inc.
LHAAP 67 November 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175					Remarks (Preservatives, etc.)	Lab I.D.#
67WW14-221107	W6	11/7/22 0855		3	X										
67WW05-221107	W6	11/7/22 0935		3	X										
67WW18-221107	W6	11/7/22 1025		3	X										
67WW17-221107	W6	11/7/22 1110		3	X										
67WW02-221107	W6	11/7/22 1210		3	X										
67WW15-221108	W6	11/8/22 0700		3	X										
67WW09-221108	W6	11/8/22 0745		3	X										
67WW11-221108	W6	11/8/22 0830		3	X										

Additional Remarks: **Standard TAT on all parameters. Please email results to** Vicki.Graves@aptim.com **and invoices to** fedinvoices@aptim.com

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	11/8/22	1300	[illegible]	11/09/22	0715						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

49303 IR31
2.1

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 575-2190 ATTN: Dane Wacasey

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 67 November 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22110553

Aptim Environmental & Infrastucture, Inc.
LHAAP 67 November 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Remarks (Preservatives, etc.)	Lab I.D.#
67WW16I-221108	WG	11/8/22 0920		3	X						
67WW16I-221108-FD	WG	11/8/22 0920		3	X						
67WW01-221108	WG	11/8/22 1005		3	X						
67WW12-221108	WG	11/8/22 1050		3	X						
67WW07-221108	WG	11/8/22 1135		3	X						
TRIP BLANK-221108	W	11/8/22		2	X						

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	11/8/22	1300	Nelson	11/09/22	9:15						

For Lab Use Only

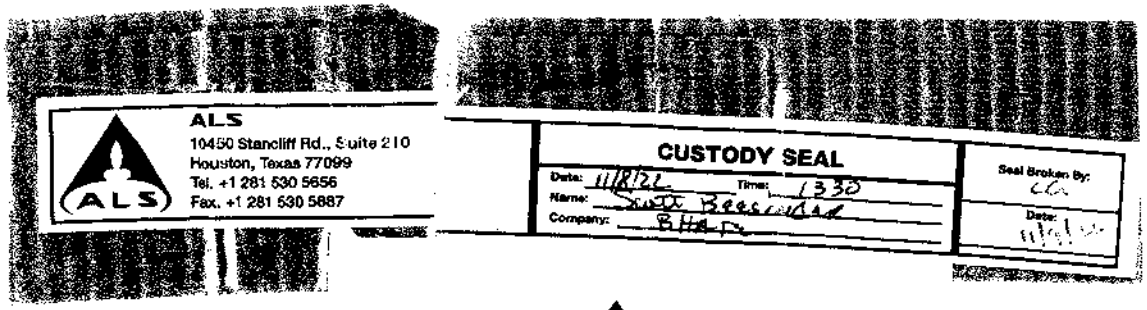
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
	11								

Remarks:

49303 IR31

2-1

(Word) S:\Forms\Chain of Custody - BiWeekly



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 11/8/22 Time: 1330
Name: Scott Beesinger
Company: BHE Env

Seal Broken By:
Date:

ORIGIN ID:SGRA (903) 930-6183
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 26OCT22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3618
DIMS: 19x16x13 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5666
REF: LHAAP 67-BO 00651-DW
RMA:

FedEx Express

FedEx TRK# 0221 5789 2000 0100

WED - 09 NOV AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 07, 2023

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22110582**

Laboratory Results for: **LHAAP 67 November 2022**

Dear Vicki Graves ,

ALS Environmental received 6 sample(s) on Nov 10, 2022 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: DANE.WACASEY
Dane J. Wacasey

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Work Order: HS22110582

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22110582-01	67WW09A-221109	Groundwater		09-Nov-2022 07:10	10-Nov-2022 09:00	☐
HS22110582-02	67WW10-221109	Groundwater		09-Nov-2022 07:55	10-Nov-2022 09:00	☐
HS22110582-03	67WW08-221109	Groundwater		09-Nov-2022 08:40	10-Nov-2022 09:00	☐
HS22110582-04	67WW08-221109-FD	Water		09-Nov-2022 08:40	10-Nov-2022 09:00	☐
HS22110582-05	67WW13-221109	Groundwater		09-Nov-2022 09:35	10-Nov-2022 09:00	☐
HS22110582-06	Trip Blank-221109	Water	CG-090622-943	09-Nov-2022 07:10	10-Nov-2022 09:00	☐

Revision:1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 67 November 2022
Work Order: HS22110582

Work Order Comments

• This report was revised February 7, 2023, to adjust the VOC analyte list to include the compounds related to site LHAAP 67.

Work Order Comments

• The analysis for CO2 by RSK175 was subcontracted to Eurofins located in Lancaster, PA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R421701

Sample ID: HS22110281-01MS

• MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R422102

Sample ID: CCV

• 4-Isopropyltoluene, Hexachlorobutadiene, n-Butylbenzene, sec-Bultybenzene and tert-Butlybenzene failed %D recovery limits for CCV. The CCV recoveries indicate potential low bias.
Normally, per SOP, the samples would have been re-analyzed to report with acceptable opening CCV. However, these analytes were added as targets after initial completion due to laboratory error of the use of incorrect analyte list. It should be noted that acceptance criteria were met for the closing CCV.

Sample ID: HS22110859-03MS

• MS and MSD are for an unrelated sample

Sample ID: 67WW13-221109 (HS22110582-05MS)

• MS and/or MSD recovered outside control limits for multiple compounds due to possible matrix effect.

Wet Chemistry by Method SW9056

Batch ID: R422228

Sample ID: 67WW13-221109 (HS22110582-05MS)

• MS and/or MSD recovered outside control limits for multiple compounds due to possible matrix effect.

WetChemistry by Method SM5310B

Batch ID: R422513,R422513

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 67 November 2022
Work Order: HS22110582

WetChemistry by Method SW9056

Batch ID: R422228

Sample ID: 67WW08-221109 (HS22110582-03)

- Sample was analyzed outside of the holding time due to instrument problems. Results should be considered estimated.

Sample ID: 67WW08-221109-FD (HS22110582-04)

- Sample was analyzed outside of the holding time due to instrument problems. Results should be considered estimated.

Sample ID: 67WW13-221109 (HS22110582-05)

- Sample was analyzed outside of the holding time due to instrument problems. Results should be considered estimated.

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW09A-221109 Lab ID:HS22110582-01
Collection Date: 09-Nov-2022 07:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:34
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 17:34
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW09A-221109 Lab ID:HS22110582-01
Collection Date: 09-Nov-2022 07:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:34
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Surr: 1,2-Dichloroethane-d4	*93.3*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 17:34*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 17:34*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 17:34*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 17:34*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW10-221109 Lab ID:HS22110582-02
Collection Date: 09-Nov-2022 07:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:56
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 17:56
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW10-221109 Lab ID:HS22110582-02
Collection Date: 09-Nov-2022 07:55 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:56
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 17:56*
Surr: 4-Bromofluorobenzene	*92.8*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 17:56*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 17:56*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 17:56*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW08-221109 Lab ID:HS22110582-03
Collection Date: 09-Nov-2022 08:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1-Dichloroethane	**5.3**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:06
1,1-Dichloroethene	**19**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:06
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dichloroethane	**0.61**	J	**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:06
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:06
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 13:06
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW08-221109 Lab ID:HS22110582-03
Collection Date: 09-Nov-2022 08:40 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:06
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 13:06*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 13:06*
Surr: Dibromofluoromethane	*91.5*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 13:06*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 13:06*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: SAM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	11-Nov-2022 16:12
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	11-Nov-2022 16:12
Methane	**0.00232**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	11-Nov-2022 16:12
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**4.16**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Nov-2022 09:33

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**2,190**		**10.0**	**25.0**	**25.0**	**mg/L**	50	18-Nov-2022 19:25
Nitrogen, Nitrate (As N)	**0.0458**	JH	**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Nov-2022 19:20
Sulfate	**649**		**10.0**	**25.0**	**25.0**	**mg/L**	50	18-Nov-2022 19:25
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2022 10:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW08-221109-FD Lab ID:HS22110582-04
Collection Date: 09-Nov-2022 08:40 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1-Dichloroethane	**5.2**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 12:44
1,1-Dichloroethene	**20**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 12:44
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 12:44
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 12:44
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW08-221109-FD Lab ID:HS22110582-04
Collection Date: 09-Nov-2022 08:40 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 12:44
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Surr: 1,2-Dichloroethane-d4	*93.5*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 12:44*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 12:44*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 12:44*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 12:44*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: SAM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	11-Nov-2022 16:31
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	11-Nov-2022 16:31
Methane	0.000500	U	0.000107	0.000500	0.000500	mg/L	1	11-Nov-2022 16:31
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**4.42**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Nov-2022 09:47

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109-FD
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**2,120**		**10.0**	**12.5**	**25.0**	**mg/L**	50	18-Nov-2022 20:02
Nitrogen, Nitrate (As N)	**0.0492**	JH	**0.0300**	**0.0500**	**0.100**	**mg/L**	1	18-Nov-2022 19:57
Sulfate	**629**		**10.0**	**12.5**	**25.0**	**mg/L**	50	18-Nov-2022 20:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2022 10:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW13-221109 Lab ID:HS22110582-05
Collection Date: 09-Nov-2022 09:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,2-Trichloroethane	**4.3**		**0.30**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
1,1-Dichloroethane	**25**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
1,1-Dichloroethene	**480**		**2.0**	**10**	**10**	**ug/L**	10	17-Nov-2022 16:05
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dichloroethane	**34**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:29
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 13:29
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW13-221109 Lab ID:HS22110582-05
Collection Date: 09-Nov-2022 09:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
cis-1,2-Dichloroethene	**1.2**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:29
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Trichloroethene	**2.1**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: 1,2-Dichloroethane-d4	*92.2*			**0**	*81-118*	*%REC*	*10*	*17-Nov-2022 16:05*
Surr: 4-Bromofluorobenzene	*96.0*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: 4-Bromofluorobenzene	*96.0*			**0**	*85-114*	*%REC*	*10*	*17-Nov-2022 16:05*
Surr: Dibromofluoromethane	*90.6*			**0**	*80-119*	*%REC*	*10*	*17-Nov-2022 16:05*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*10*	*17-Nov-2022 16:05*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: SAM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	11-Nov-2022 16:43
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	11-Nov-2022 16:43
Methane	0.000500	U	0.000107	0.000500	0.000500	mg/L	1	11-Nov-2022 16:43

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW13-221109
Collection Date: 09-Nov-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.92**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Nov-2022 10:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**1,460**		**10.0**	**12.5**	**25.0**	**mg/L**	50	18-Nov-2022 19:15
Nitrogen, Nitrate (As N)	**0.114**	H	**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Nov-2022 18:59
Sulfate	**348**		**10.0**	**25.0**	**25.0**	**mg/L**	50	18-Nov-2022 19:15
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2022 10:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: Trip Blank-221109 Lab ID:HS22110582-06
Collection Date: 09-Nov-2022 07:10 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 16:27
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 16:27
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: Trip Blank-221109 Lab ID:HS22110582-06
Collection Date: 09-Nov-2022 07:10 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 16:27
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 16:27*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 16:27*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 16:27*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 16:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R421701 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			11 Nov 2022 16:31	1
Batch ID: R421701 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			11 Nov 2022 16:12	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			11 Nov 2022 16:43	1
Batch ID: R422102 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			17 Nov 2022 12:44	1
HS22110582-06	Trip Blank-221109	09 Nov 2022 07:10			17 Nov 2022 16:27	1
Batch ID: R422102 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22110582-01	67WW09A-221109	09 Nov 2022 07:10			17 Nov 2022 17:34	1
HS22110582-02	67WW10-221109	09 Nov 2022 07:55			17 Nov 2022 17:56	1
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			17 Nov 2022 13:06	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			17 Nov 2022 16:05	10
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			17 Nov 2022 13:29	1
Batch ID: R422228 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			18 Nov 2022 20:02	50
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			18 Nov 2022 19:57	1
Batch ID: R422228 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			18 Nov 2022 19:25	50
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			18 Nov 2022 19:20	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			18 Nov 2022 19:15	50
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			18 Nov 2022 18:59	1
Batch ID: R422513 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			23 Nov 2022 09:47	1
Batch ID: R422513 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			23 Nov 2022 09:33	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			23 Nov 2022 10:26	1
Batch ID: R422804 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			30 Nov 2022 10:04	1
Batch ID: R422804 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			30 Nov 2022 10:04	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			30 Nov 2022 10:04	1

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R421701 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MBLK Sample ID: **MBLK-221111** Units: **mg/L** Analysis Date: **11-Nov-2022 08:52**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978931** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-221111** Units: **mg/L** Analysis Date: **11-Nov-2022 09:00**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978932** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0201	0.00100	0.01804	0	112	75 - 125				
Ethene	0.0186	0.00100	0.0168	0	111	75 - 125				
Methane	0.00859	0.000500	0.009647	0	89.0	75 - 125				

LCSD Sample ID: **LCSD-221111** Units: **mg/L** Analysis Date: **11-Nov-2022 09:08**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978933** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0206	0.00100	0.01804	0	114	75 - 125	0.02012	2.54	30	
Ethene	0.0190	0.00100	0.0168	0	113	75 - 125	0.01862	2.1	30	
Methane	0.00887	0.000500	0.009647	0	91.9	75 - 125	0.008588	3.23	30	

MS Sample ID: **HS22110582-05MS** Units: **mg/L** Analysis Date: **11-Nov-2022 17:06**
Client ID: **67WW13-221109** Run ID: **FID-4_421701** SeqNo: **6978955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0212	0.00100	0.01804	0	118	75 - 125				
Ethene	0.0187	0.00100	0.0168	0	111	75 - 125				
Methane	0.00886	0.000500	0.009647	0	91.8	75 - 125				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R421701 (0) **Instrument: FID-4** **Method: DISSOLVED GASES BY RSK-175**

MS Sample ID: **HS22110281-01MS** Units: **mg/L** Analysis Date: **11-Nov-2022 14:15**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978947** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0240	0.00100	0.01804	0	133	75 - 125				S
Ethene	0.0223	0.00100	0.0168	0	133	75 - 125				S
Methane	0.00937	0.000500	0.009647	0.001261	84.1	75 - 125				

MSD Sample ID: **HS22110582-05MSD** Units: **mg/L** Analysis Date: **11-Nov-2022 17:18**
Client ID: **67WW13-221109** Run ID: **FID-4_421701** SeqNo: **6978956** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0216	0.00100	0.01804	0	119	75 - 125	0.02121	1.61	30	
Ethene	0.0195	0.00100	0.0168	0	116	75 - 125	0.01872	4.3	30	
Methane	0.00912	0.000500	0.009647	0	94.5	75 - 125	0.008861	2.83	30	

MSD Sample ID: **HS22110281-01MSD** Units: **mg/L** Analysis Date: **11-Nov-2022 14:32**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978948** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0250	0.00100	0.01804	0	139	75 - 125	0.02404	3.91	30	S
Ethene	0.0227	0.00100	0.0168	0	135	75 - 125	0.02233	1.62	30	S
Methane	0.00951	0.000500	0.009647	0.001261	85.5	75 - 125	0.009369	1.48	30	

The following samples were analyzed in this batch: HS22110582-03 HS22110582-04 HS22110582-05

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 12:22**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	1.0	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	1.0	1.0								U
1,1-Dichloroethene	1.0	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	1.0	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	1.0	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	1.0	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	1.0	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	1.0	1.0								U
Bromodichloromethane	1.0	1.0								U
Bromoform	1.0	1.0								U

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 12:22**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	1.0	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	1.0	1.0								U
Chloromethane	1.0	1.0								U
cis-1,2-Dichloroethene	1.0	1.0								U
cis-1,3-Dichloropropene	1.0	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	1.0	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	1.0	1.0								U
trans-1,2-Dichloroethene	1.0	1.0								U
trans-1,3-Dichloropropene	1.0	1.0								U
Trichloroethene	1.0	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	1.0	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.61*	*1.0*	*50*	*0*	*91.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.11*	*1.0*	*50*	*0*	*96.2*	*85 - 114*				
Surr: Dibromofluoromethane	*45.25*	*1.0*	*50*	*0*	*90.5*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 12:22**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*54.69*	*1.0*	*50*	*0*	*109*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 11:37**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987954** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.99	1.0	20	0	105	78 - 124				
1,1,1-Trichloroethane	20.17	1.0	20	0	101	74 - 131				
1,1,2,2-Tetrachloroethane	20.59	1.0	20	0	103	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.77	1.0	20	0	114	70 - 136				
1,1,2-Trichloroethane	20.96	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.18	1.0	20	0	95.9	77 - 125				
1,1-Dichloroethene	19.29	1.0	20	0	96.4	71 - 131				
1,1-Dichloropropene	20.08	1.0	20	0	100	78 - 125				
1,2,3-Trichlorobenzene	19.45	1.0	20	0	97.3	69 - 129				
1,2,3-Trichloropropane	20.49	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	18.41	1.0	20	0	92.0	69 - 130				
1,2,4-Trimethylbenzene	21.31	1.0	20	0	107	76 - 124				
1,2-Dibromo-3-chloropropane	16.8	1.0	20	0	84.0	62 - 128				
1,2-Dibromoethane	21.16	1.0	20	0	106	77 - 121				
1,2-Dichlorobenzene	20.12	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	20.82	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	21.13	1.0	20	0	106	78 - 122				
1,3,5-Trimethylbenzene	21.04	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	20.82	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	21.46	1.0	20	0	107	80 - 119				
1,4-Dichlorobenzene	19.78	1.0	20	0	98.9	79 - 118				
2,2-Dichloropropane	18.54	1.0	20	0	92.7	60 - 139				
2-Butanone	46.41	2.0	40	0	116	56 - 143				
2-Chlorotoluene	21.13	1.0	20	0	106	79 - 122				
2-Hexanone	38.36	2.0	40	0	95.9	57 - 139				
4-Chlorotoluene	21.04	1.0	20	0	105	78 - 122				
4-Isopropyltoluene	19.1	1.0	20	0	95.5	77 - 127				
4-Methyl-2-pentanone	40.16	2.0	40	0	100	67 - 130				
Acetone	43.83	2.0	40	0	110	39 - 160				
Benzene	20.67	1.0	20	0	103	79 - 120				
Bromobenzene	21.34	1.0	20	0	107	80 - 120				
Bromochloromethane	20.04	1.0	20	0	100	78 - 123				
Bromodichloromethane	20.2	1.0	20	0	101	79 - 125				
Bromoform	16.95	1.0	20	0	84.8	66 - 130				

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ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 11:37**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987954** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	19.75	1.0	20	0	98.7	53 - 141				
Carbon disulfide	36.1	2.0	40	0	90.3	64 - 133				
Carbon tetrachloride	23.63	1.0	20	0	118	72 - 136				
Chlorobenzene	20.46	1.0	20	0	102	82 - 118				
Chloroethane	18.93	1.0	20	0	94.6	60 - 138				
Chloroform	20.14	1.0	20	0	101	79 - 124				
Chloromethane	19.51	1.0	20	0	97.5	50 - 139				
cis-1,2-Dichloroethene	20.2	1.0	20	0	101	78 - 123				
cis-1,3-Dichloropropene	17.5	1.0	20	0	87.5	75 - 124				
Dibromochloromethane	18.58	1.0	20	0	92.9	74 - 126				
Dibromomethane	19.77	1.0	20	0	98.8	79 - 123				
Dichlorodifluoromethane	19.72	1.0	20	0	98.6	32 - 152				
Ethylbenzene	20.34	1.0	20	0	102	79 - 121				
Hexachlorobutadiene	21.01	1.0	20	0	105	66 - 134				
Isopropylbenzene	20.1	1.0	20	0	100	72 - 131				
m,p-Xylene	40.4	2.0	40	0	101	80 - 121				
Methylene chloride	21.45	2.0	20	0	107	74 - 124				
Naphthalene	18.2	1.0	20	0	91.0	61 - 128				
n-Butylbenzene	18.63	1.0	20	0	93.2	75 - 128				
n-Propylbenzene	19.65	1.0	20	0	98.2	76 - 126				
o-Xylene	20.24	1.0	20	0	101	78 - 122				
sec-Butylbenzene	18.29	1.0	20	0	91.5	77 - 126				
Styrene	19.44	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.9	78 - 124				
Tetrachloroethene	19.39	1.0	20	0	96.9	74 - 129				
Toluene	21.38	1.0	20	0	107	80 - 121				
trans-1,2-Dichloroethene	19.28	1.0	20	0	96.4	75 - 124				
trans-1,3-Dichloropropene	16.86	1.0	20	0	84.3	73 - 127				
Trichloroethene	20.17	1.0	20	0	101	79 - 123				
Trichlorofluoromethane	19.46	1.0	20	0	97.3	65 - 141				
Vinyl chloride	19.28	1.0	20	0	96.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.54*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.48*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*52.39*	*1.0*	*50*	*0*	*105*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 11:37**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987954** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.05*	*1.0*	*50*	*0*	*104*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110859-03MS** Units: **ug/L** Analysis Date: **17-Nov-2022 15:20**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987963** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	11310	500	10000	0	113	78 - 124				
1,1,1-Trichloroethane	11460	500	10000	0	115	74 - 131				
1,1,2,2-Tetrachloroethane	10560	500	10000	0	106	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	40600	500	10000	31320	92.8	70 - 136				
1,1,2-Trichloroethane	10860	500	10000	0	109	80 - 119				
1,1-Dichloroethane	9665	500	10000	0	96.6	77 - 125				
1,1-Dichloroethene	10820	500	10000	0	108	71 - 131				
1,1-Dichloropropene	12810	500	10000	0	128	78 - 125				S
1,2,3-Trichlorobenzene	10960	500	10000	0	110	69 - 129				
1,2,3-Trichloropropane	9852	500	10000	0	98.5	73 - 122				
1,2,4-Trichlorobenzene	11000	500	10000	0	110	69 - 130				
1,2,4-Trimethylbenzene	12420	500	10000	0	124	76 - 124				S
1,2-Dibromo-3-chloropropane	8398	500	10000	0	84.0	62 - 128				
1,2-Dibromoethane	10730	500	10000	0	107	77 - 121				
1,2-Dichlorobenzene	11020	500	10000	0	110	80 - 119				
1,2-Dichloroethane	10370	500	10000	0	104	73 - 128				
1,2-Dichloropropane	10930	500	10000	0	109	78 - 122				
1,3,5-Trimethylbenzene	12930	500	10000	0	129	75 - 124				S
1,3-Dichlorobenzene	11640	500	10000	0	116	80 - 119				
1,3-Dichloropropane	10950	500	10000	0	110	80 - 119				
1,4-Dichlorobenzene	10970	500	10000	0	110	79 - 118				
2,2-Dichloropropane	10100	500	10000	0	101	60 - 139				
2-Butanone	18990	1000	20000	1809	85.9	56 - 143				
2-Chlorotoluene	12390	500	10000	0	124	79 - 122				S
2-Hexanone	18430	1000	20000	0	92.1	57 - 139				
4-Chlorotoluene	12160	500	10000	0	122	78 - 122				
4-Isopropyltoluene	12950	500	10000	0	130	77 - 127				S
4-Methyl-2-pentanone	19890	1000	20000	0	99.5	67 - 130				
Acetone	12770	1000	20000	0	63.9	39 - 160				
Benzene	10980	500	10000	0	110	79 - 120				
Bromobenzene	11450	500	10000	0	115	80 - 120				
Bromochloromethane	9330	500	10000	0	93.3	78 - 123				
Bromodichloromethane	10480	500	10000	0	105	79 - 125				
Bromoform	8643	500	10000	0	86.4	66 - 130				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110859-03MS** Units: **ug/L** Analysis Date: **17-Nov-2022 15:20**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987963** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	9707	500	10000	0	97.1	53 - 141				
Carbon disulfide	19190	1000	20000	0	95.9	64 - 133				
Carbon tetrachloride	14940	500	10000	0	149	72 - 136				S
Chlorobenzene	11260	500	10000	0	113	82 - 118				
Chloroethane	9810	500	10000	0	98.1	60 - 138				
Chloroform	10010	500	10000	0	100	79 - 124				
Chloromethane	9522	500	10000	0	95.2	50 - 139				
cis-1,2-Dichloroethene	10040	500	10000	0	100	78 - 123				
cis-1,3-Dichloropropene	9184	500	10000	0	91.8	75 - 124				
Dibromochloromethane	9496	500	10000	0	95.0	74 - 126				
Dibromomethane	10210	500	10000	0	102	79 - 123				
Dichlorodifluoromethane	9816	500	10000	0	98.2	32 - 152				
Ethylbenzene	12230	500	10000	0	122	79 - 121				S
Hexachlorobutadiene	14410	500	10000	0	144	66 - 134				S
Isopropylbenzene	13240	500	10000	0	132	72 - 131				S
m,p-Xylene	24170	1000	20000	0	121	80 - 121				
Methylene chloride	9707	1000	10000	0	97.1	74 - 124				
Naphthalene	10090	500	10000	0	101	61 - 128				
n-Butylbenzene	12830	500	10000	0	128	75 - 128				S
n-Propylbenzene	12830	500	10000	0	128	76 - 126				S
o-Xylene	11930	500	10000	0	119	78 - 122				
sec-Butylbenzene	12430	500	10000	0	124	77 - 126				
Styrene	10510	500	10000	0	105	78 - 123				
tert-Butylbenzene	12920	500	10000	0	129	78 - 124				S
Tetrachloroethene	23480	500	10000	10420	131	74 - 129				S
Toluene	12390	500	10000	0	124	80 - 121				S
trans-1,2-Dichloroethene	10200	500	10000	0	102	75 - 124				
trans-1,3-Dichloropropene	8528	500	10000	0	85.3	73 - 127				
Trichloroethene	40720	500	10000	29470	113	79 - 123				
Trichlorofluoromethane	11180	500	10000	0	112	65 - 141				
Vinyl chloride	10120	500	10000	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*22520*	*500*	*25000*	*0*	*90.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*25900*	*500*	*25000*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*23460*	*500*	*25000*	*0*	*93.9*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110859-03MS** Units: **ug/L** Analysis Date: **17-Nov-2022 15:20**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987963** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*27440*	*500*	*25000*	*0*	*110*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110582-05MS** Units: **ug/L** Analysis Date: **17-Nov-2022 14:36**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	23.47	1.0	20	0	117	78 - 124				
1,1,1-Trichloroethane	23.31	1.0	20	0	117	74 - 131				
1,1,2,2-Tetrachloroethane	22.34	1.0	20	0	112	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	33.52	1.0	20	0	168	70 - 136				S
1,1,2-Trichloroethane	26.96	1.0	20	4.336	113	80 - 119				
1,1-Dichloroethane	44.39	1.0	20	24.96	97.2	77 - 125				
1,1-Dichloroethene	554.6	1.0	20	548.4	30.9	71 - 131				SEO
1,1-Dichloropropene	26.79	1.0	20	0	134	78 - 125				S
1,2,3-Trichlorobenzene	20.45	1.0	20	0	102	69 - 129				
1,2,3-Trichloropropane	21.77	1.0	20	0	109	73 - 122				
1,2,4-Trichlorobenzene	20.8	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	25.62	1.0	20	0	128	76 - 124				S
1,2-Dibromo-3-chloropropane	17.6	1.0	20	0	88.0	62 - 128				
1,2-Dibromoethane	22.34	1.0	20	0	112	77 - 121				
1,2-Dichlorobenzene	22.83	1.0	20	0	114	80 - 119				
1,2-Dichloroethane	56.32	1.0	20	33.95	112	73 - 128				
1,2-Dichloropropane	22.64	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	27.02	1.0	20	0	135	75 - 124				S
1,3-Dichlorobenzene	24.03	1.0	20	0	120	80 - 119				S
1,3-Dichloropropane	22.73	1.0	20	0	114	80 - 119				
1,4-Dichlorobenzene	22.23	1.0	20	0	111	79 - 118				
2,2-Dichloropropane	20.77	1.0	20	0	104	60 - 139				
2-Butanone	36.37	2.0	40	0	90.9	56 - 143				
2-Chlorotoluene	25.66	1.0	20	0	128	79 - 122				S
2-Hexanone	38.58	2.0	40	0	96.5	57 - 139				
4-Chlorotoluene	25.55	1.0	20	0	128	78 - 122				S
4-Isopropyltoluene	26.79	1.0	20	0	134	77 - 127				S
4-Methyl-2-pentanone	43.63	2.0	40	0	109	67 - 130				
Acetone	25.37	2.0	40	0	63.4	39 - 160				
Benzene	23.37	1.0	20	0	117	79 - 120				
Bromobenzene	23.82	1.0	20	0	119	80 - 120				
Bromochloromethane	19.17	1.0	20	0	95.9	78 - 123				
Bromodichloromethane	21.77	1.0	20	0	109	79 - 125				
Bromoform	17.73	1.0	20	0	88.6	66 - 130				

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ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110582-05MS** Units: **ug/L** Analysis Date: **17-Nov-2022 14:36**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	20.3	1.0	20	0	102	53 - 141				
Carbon disulfide	38.82	2.0	40	0	97.0	64 - 133				
Carbon tetrachloride	31.48	1.0	20	0	157	72 - 136				S
Chlorobenzene	23.4	1.0	20	0	117	82 - 118				
Chloroethane	20.06	1.0	20	0	100	60 - 138				
Chloroform	20.9	1.0	20	0	105	79 - 124				
Chloromethane	19.49	1.0	20	0	97.5	50 - 139				
cis-1,2-Dichloroethene	21.48	1.0	20	1.231	101	78 - 123				
cis-1,3-Dichloropropene	18.7	1.0	20	0	93.5	75 - 124				
Dibromochloromethane	19.39	1.0	20	0	96.9	74 - 126				
Dibromomethane	21.31	1.0	20	0	107	79 - 123				
Dichlorodifluoromethane	20.71	1.0	20	0	104	32 - 152				
Ethylbenzene	25.48	1.0	20	0	127	79 - 121				S
Hexachlorobutadiene	31.61	1.0	20	0	158	66 - 134				S
Isopropylbenzene	26.93	1.0	20	0	135	72 - 131				S
m,p-Xylene	48.96	2.0	40	0	122	80 - 121				S
Methylene chloride	19.7	2.0	20	0	98.5	74 - 124				
Naphthalene	18.17	1.0	20	0	90.9	61 - 128				
n-Butylbenzene	26.1	1.0	20	0	131	75 - 128				S
n-Propylbenzene	26.62	1.0	20	0	133	76 - 126				S
o-Xylene	24.45	1.0	20	0	122	78 - 122				S
sec-Butylbenzene	25.93	1.0	20	0	130	77 - 126				S
Styrene	20.47	1.0	20	0	102	78 - 123				
tert-Butylbenzene	27.11	1.0	20	0	136	78 - 124				S
Tetrachloroethene	27.8	1.0	20	0	139	74 - 129				S
Toluene	25.57	1.0	20	0	128	80 - 121				S
trans-1,2-Dichloroethene	20.79	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	17.11	1.0	20	0	85.6	73 - 127				
Trichloroethene	27.86	1.0	20	2.116	129	79 - 123				S
Trichlorofluoromethane	22.55	1.0	20	0	113	65 - 141				
Vinyl chloride	21.09	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.22*	*1.0*	*50*	*0*	*88.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.8*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*45.99*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110582-05MS** Units: **ug/L** Analysis Date: **17-Nov-2022 14:36**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*55.01*	*1.0*	*50*	*0*	*110*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110859-03MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 15:42**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987964** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	11080	500	10000	0	111	78 - 124	11310	2.04	20	
1,1,1-Trichloroethane	10910	500	10000	0	109	74 - 131	11460	4.87	20	
1,1,2,2-Tetrachloroethane	10670	500	10000	0	107	71 - 121	10560	1.08	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	38800	500	10000	31320	74.8	70 - 136	40600	4.54	20	
1,1,2-Trichloroethane	10500	500	10000	0	105	80 - 119	10860	3.29	20	
1,1-Dichloroethane	9313	500	10000	0	93.1	77 - 125	9665	3.71	20	
1,1-Dichloroethene	10080	500	10000	0	101	71 - 131	10820	7.09	20	
1,1-Dichloropropene	12020	500	10000	0	120	78 - 125	12810	6.3	20	
1,2,3-Trichlorobenzene	10990	500	10000	0	110	69 - 129	10960	0.231	20	
1,2,3-Trichloropropane	10270	500	10000	0	103	73 - 122	9852	4.11	20	
1,2,4-Trichlorobenzene	10980	500	10000	0	110	69 - 130	11000	0.169	20	
1,2,4-Trimethylbenzene	12440	500	10000	0	124	76 - 124	12420	0.2	20	S
1,2-Dibromo-3-chloropropane	8536	500	10000	0	85.4	62 - 128	8398	1.63	20	
1,2-Dibromoethane	10690	500	10000	0	107	77 - 121	10730	0.416	20	
1,2-Dichlorobenzene	10580	500	10000	0	106	80 - 119	11020	4.02	20	
1,2-Dichloroethane	10270	500	10000	0	103	73 - 128	10370	0.953	20	
1,2-Dichloropropane	10610	500	10000	0	106	78 - 122	10930	2.91	20	
1,3,5-Trimethylbenzene	12580	500	10000	0	126	75 - 124	12930	2.71	20	S
1,3-Dichlorobenzene	11280	500	10000	0	113	80 - 119	11640	3.17	20	
1,3-Dichloropropane	10810	500	10000	0	108	80 - 119	10950	1.27	20	
1,4-Dichlorobenzene	10640	500	10000	0	106	79 - 118	10970	3.05	20	
2,2-Dichloropropane	9741	500	10000	0	97.4	60 - 139	10100	3.66	20	
2-Butanone	19310	1000	20000	1809	87.5	56 - 143	18990	1.68	20	
2-Chlorotoluene	12190	500	10000	0	122	79 - 122	12390	1.62	20	
2-Hexanone	18340	1000	20000	0	91.7	57 - 139	18430	0.467	20	
4-Chlorotoluene	11960	500	10000	0	120	78 - 122	12160	1.64	20	
4-Isopropyltoluene	12690	500	10000	0	127	77 - 127	12950	2.08	20	
4-Methyl-2-pentanone	20350	1000	20000	0	102	67 - 130	19890	2.25	20	
Acetone	13720	1000	20000	0	68.6	39 - 160	12770	7.18	20	
Benzene	10680	500	10000	0	107	79 - 120	10980	2.85	20	
Bromobenzene	11130	500	10000	0	111	80 - 120	11450	2.83	20	
Bromochloromethane	9317	500	10000	0	93.2	78 - 123	9330	0.138	20	
Bromodichloromethane	9942	500	10000	0	99.4	79 - 125	10480	5.26	20	
Bromoform	8688	500	10000	0	86.9	66 - 130	8643	0.517	20	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110859-03MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 15:42**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987964** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	9100	500	10000	0	91.0	53 - 141	9707	6.46	20	
Carbon disulfide	18350	1000	20000	0	91.8	64 - 133	19190	4.45	20	
Carbon tetrachloride	14350	500	10000	0	143	72 - 136	14940	4.04	20	S
Chlorobenzene	11020	500	10000	0	110	82 - 118	11260	2.15	20	
Chloroethane	9646	500	10000	0	96.5	60 - 138	9810	1.69	20	
Chloroform	9747	500	10000	0	97.5	79 - 124	10010	2.65	20	
Chloromethane	8910	500	10000	0	89.1	50 - 139	9522	6.64	20	
cis-1,2-Dichloroethene	9637	500	10000	0	96.4	78 - 123	10040	4.11	20	
cis-1,3-Dichloropropene	8960	500	10000	0	89.6	75 - 124	9184	2.46	20	
Dibromochloromethane	9456	500	10000	0	94.6	74 - 126	9496	0.425	20	
Dibromomethane	9930	500	10000	0	99.3	79 - 123	10210	2.76	20	
Dichlorodifluoromethane	9387	500	10000	0	93.9	32 - 152	9816	4.46	20	
Ethylbenzene	11930	500	10000	0	119	79 - 121	12230	2.49	20	
Hexachlorobutadiene	13960	500	10000	0	140	66 - 134	14410	3.12	20	S
Isopropylbenzene	12750	500	10000	0	128	72 - 131	13240	3.77	20	
m,p-Xylene	23670	1000	20000	0	118	80 - 121	24170	2.09	20	
Methylene chloride	9458	1000	10000	0	94.6	74 - 124	9707	2.6	20	
Naphthalene	10320	500	10000	0	103	61 - 128	10090	2.21	20	
n-Butylbenzene	12650	500	10000	0	127	75 - 128	12830	1.38	20	
n-Propylbenzene	12720	500	10000	0	127	76 - 126	12830	0.838	20	S
o-Xylene	11470	500	10000	0	115	78 - 122	11930	3.96	20	
sec-Butylbenzene	12290	500	10000	0	123	77 - 126	12430	1.12	20	
Styrene	10340	500	10000	0	103	78 - 123	10510	1.61	20	
tert-Butylbenzene	12710	500	10000	0	127	78 - 124	12920	1.67	20	S
Tetrachloroethene	22140	500	10000	10420	117	74 - 129	23480	5.89	20	
Toluene	11980	500	10000	0	120	80 - 121	12390	3.39	20	
trans-1,2-Dichloroethene	9611	500	10000	0	96.1	75 - 124	10200	5.91	20	
trans-1,3-Dichloropropene	8565	500	10000	0	85.7	73 - 127	8528	0.435	20	
Trichloroethene	38890	500	10000	29470	94.2	79 - 123	40720	4.62	20	
Trichlorofluoromethane	10780	500	10000	0	108	65 - 141	11180	3.68	20	
Vinyl chloride	9718	500	10000	0	97.2	58 - 137	10120	4.1	20	
Surr: 1,2-Dichloroethane-d4	*22470*	*500*	*25000*	*0*	*89.9*	*81 - 118*	*22520*	*0.208*	*20*	
Surr: 4-Bromofluorobenzene	*25860*	*500*	*25000*	*0*	*103*	*85 - 114*	*25900*	*0.158*	*20*	
Surr: Dibromofluoromethane	*23020*	*500*	*25000*	*0*	*92.1*	*80 - 119*	*23460*	*1.93*	*20*	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110859-03MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 15:42**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987964** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*27630*	*500*	*25000*	*0*	*111*	*89 - 112*	*27440*	*0.722*	*20*	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110582-05MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 14:58**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.95	1.0	20	0	110	78 - 124	23.47	6.69	20	
1,1,1-Trichloroethane	22.91	1.0	20	0	115	74 - 131	23.31	1.71	20	
1,1,2,2-Tetrachloroethane	21.1	1.0	20	0	106	71 - 121	22.34	5.68	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	31.57	1.0	20	0	158	70 - 136	33.52	6	20	S
1,1,2-Trichloroethane	25.21	1.0	20	4.336	104	80 - 119	26.96	6.68	20	
1,1-Dichloroethane	43.57	1.0	20	24.96	93.0	77 - 125	44.39	1.88	20	
1,1-Dichloroethene	546.2	1.0	20	548.4	-11.1	71 - 131	554.6	1.53	20	SEO
1,1-Dichloropropene	25.33	1.0	20	0	127	78 - 125	26.79	5.6	20	S
1,2,3-Trichlorobenzene	21.33	1.0	20	0	107	69 - 129	20.45	4.22	20	
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122	21.77	6.01	20	
1,2,4-Trichlorobenzene	21.57	1.0	20	0	108	69 - 130	20.8	3.59	20	
1,2,4-Trimethylbenzene	24.94	1.0	20	0	125	76 - 124	25.62	2.68	20	S
1,2-Dibromo-3-chloropropane	16.93	1.0	20	0	84.6	62 - 128	17.6	3.91	20	
1,2-Dibromoethane	21.89	1.0	20	0	109	77 - 121	22.34	2.07	20	
1,2-Dichlorobenzene	22.08	1.0	20	0	110	80 - 119	22.83	3.32	20	
1,2-Dichloroethane	54.59	1.0	20	33.95	103	73 - 128	56.32	3.11	20	
1,2-Dichloropropane	21.8	1.0	20	0	109	78 - 122	22.64	3.78	20	
1,3,5-Trimethylbenzene	26.03	1.0	20	0	130	75 - 124	27.02	3.73	20	S
1,3-Dichlorobenzene	23.58	1.0	20	0	118	80 - 119	24.03	1.91	20	
1,3-Dichloropropane	21.86	1.0	20	0	109	80 - 119	22.73	3.91	20	
1,4-Dichlorobenzene	21.83	1.0	20	0	109	79 - 118	22.23	1.81	20	
2,2-Dichloropropane	19.91	1.0	20	0	99.6	60 - 139	20.77	4.22	20	
2-Butanone	35.34	2.0	40	0	88.3	56 - 143	36.37	2.87	20	
2-Chlorotoluene	24.85	1.0	20	0	124	79 - 122	25.66	3.22	20	S
2-Hexanone	37.29	2.0	40	0	93.2	57 - 139	38.58	3.42	20	
4-Chlorotoluene	24.28	1.0	20	0	121	78 - 122	25.55	5.08	20	
4-Isopropyltoluene	25.74	1.0	20	0	129	77 - 127	26.79	3.98	20	S
4-Methyl-2-pentanone	41.31	2.0	40	0	103	67 - 130	43.63	5.45	20	
Acetone	23.25	2.0	40	0	58.1	39 - 160	25.37	8.74	20	
Benzene	22.44	1.0	20	0	112	79 - 120	23.37	4.06	20	
Bromobenzene	22.91	1.0	20	0	115	80 - 120	23.82	3.9	20	
Bromochloromethane	18.56	1.0	20	0	92.8	78 - 123	19.17	3.28	20	
Bromodichloromethane	20.84	1.0	20	0	104	79 - 125	21.77	4.4	20	
Bromoform	17.05	1.0	20	0	85.2	66 - 130	17.73	3.91	20	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110582-05MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 14:58**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	19.15	1.0	20	0	95.8	53 - 141	20.3	5.81	20	
Carbon disulfide	38.08	2.0	40	0	95.2	64 - 133	38.82	1.91	20	
Carbon tetrachloride	30	1.0	20	0	150	72 - 136	31.48	4.81	20	S
Chlorobenzene	22.63	1.0	20	0	113	82 - 118	23.4	3.36	20	
Chloroethane	19.59	1.0	20	0	98.0	60 - 138	20.06	2.34	20	
Chloroform	20.4	1.0	20	0	102	79 - 124	20.9	2.42	20	
Chloromethane	19	1.0	20	0	95.0	50 - 139	19.49	2.56	20	
cis-1,2-Dichloroethene	20.83	1.0	20	1.231	98.0	78 - 123	21.48	3.05	20	
cis-1,3-Dichloropropene	18.01	1.0	20	0	90.0	75 - 124	18.7	3.78	20	
Dibromochloromethane	18.66	1.0	20	0	93.3	74 - 126	19.39	3.8	20	
Dibromomethane	20.55	1.0	20	0	103	79 - 123	21.31	3.59	20	
Dichlorodifluoromethane	20.12	1.0	20	0	101	32 - 152	20.71	2.88	20	
Ethylbenzene	24.24	1.0	20	0	121	79 - 121	25.48	5	20	S
Hexachlorobutadiene	30.11	1.0	20	0	151	66 - 134	31.61	4.85	20	S
Isopropylbenzene	25.91	1.0	20	0	130	72 - 131	26.93	3.88	20	
m,p-Xylene	47.82	2.0	40	0	120	80 - 121	48.96	2.35	20	
Methylene chloride	19.11	2.0	20	0	95.6	74 - 124	19.7	3.05	20	
Naphthalene	19.93	1.0	20	0	99.6	61 - 128	18.17	9.23	20	
n-Butylbenzene	26.11	1.0	20	0	131	75 - 128	26.1	0.00496	20	S
n-Propylbenzene	25.98	1.0	20	0	130	76 - 126	26.62	2.41	20	S
o-Xylene	23.56	1.0	20	0	118	78 - 122	24.45	3.69	20	
sec-Butylbenzene	25.32	1.0	20	0	127	77 - 126	25.93	2.36	20	S
Styrene	19.65	1.0	20	0	98.3	78 - 123	20.47	4.07	20	
tert-Butylbenzene	26.29	1.0	20	0	131	78 - 124	27.11	3.08	20	S
Tetrachloroethene	25.63	1.0	20	0	128	74 - 129	27.8	8.12	20	
Toluene	24.11	1.0	20	0	121	80 - 121	25.57	5.85	20	
trans-1,2-Dichloroethene	20.67	1.0	20	0	103	75 - 124	20.79	0.616	20	
trans-1,3-Dichloropropene	16.83	1.0	20	0	84.1	73 - 127	17.11	1.69	20	
Trichloroethene	25.5	1.0	20	2.116	117	79 - 123	27.86	8.81	20	
Trichlorofluoromethane	22.17	1.0	20	0	111	65 - 141	22.55	1.69	20	
Vinyl chloride	20.61	1.0	20	0	103	58 - 137	21.09	2.3	20	
Surr: 1,2-Dichloroethane-d4	*45.08*	*1.0*	*50*	*0*	*90.2*	*81 - 118*	*44.22*	*1.93*	*20*	
Surr: 4-Bromofluorobenzene	*51.84*	*1.0*	*50*	*0*	*104*	*85 - 114*	*51.8*	*0.0733*	*20*	
Surr: Dibromofluoromethane	*46.98*	*1.0*	*50*	*0*	*94.0*	*80 - 119*	*45.99*	*2.13*	*20*	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110582-05MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 14:58**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*54.04*	*1.0*	*50*	*0*	*108*	*89 - 112*	*55.01*	*1.79*	*20*	

The following samples were analyzed in this batch: HS22110582-01 HS22110582-02 HS22110582-03 HS22110582-04 HS22110582-05 HS22110582-06

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422228 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **18-Nov-2022 17:03**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991408** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.250	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.0500	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **18-Nov-2022 17:08**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.26	0.500	20	0	96.3	80 - 120				
Nitrogen, Nitrate (As N)	3.901	0.100	4	0	97.5	80 - 120				
Nitrogen, Nitrite (As N)	3.903	0.100	4	0	97.6	80 - 120				
Sulfate	19.74	0.500	20	0	98.7	80 - 120				

MS Sample ID: **HS22110582-05MS** Units: **mg/L** Analysis Date: **18-Nov-2022 19:04**
Client ID: **67WW13-221109** Run ID: **ICS-Integrion_422228** SeqNo: **6991425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1267	0.500	10	1275	-79.9	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.083	0.100	2	0.1144	98.4	80 - 120				
Nitrogen, Nitrite (As N)	1.342	0.100	2	0	67.1	80 - 120				S
Sulfate	291.2	0.500	10	288.2	30.1	80 - 120				SEO

MS Sample ID: **HS22110164-08MS** Units: **mg/L** Analysis Date: **18-Nov-2022 18:01**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991416** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	106.4	1.00	20	87.86	92.8	80 - 120				O
Nitrogen, Nitrate (As N)	4.125	0.200	4	0.1284	99.9	80 - 120				
Nitrogen, Nitrite (As N)	4.001	0.200	4	0.2536	93.7	80 - 120				
Sulfate	39.34	1.00	20	19.27	100	80 - 120				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422228 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS22110582-05MSD** Units: **mg/L** Analysis Date: **18-Nov-2022 19:09**
Client ID: **67WW13-221109** Run ID: **ICS-Integrion_422228** SeqNo: **6991426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1263	0.500	10	1275	-118	80 - 120	1267	0.304	20	SEO
Nitrogen, Nitrate (As N)	2.085	0.100	2	0.1144	98.5	80 - 120	2.083	0.11	20	
Nitrogen, Nitrite (As N)	1.322	0.100	2	0	66.1	80 - 120	1.342	1.47	20	S
Sulfate	290.8	0.500	10	288.2	26.5	80 - 120	291.2	0.126	20	SEO

MSD Sample ID: **HS22110164-08MSD** Units: **mg/L** Analysis Date: **18-Nov-2022 18:06**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991417** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	106.8	1.00	20	87.86	94.9	80 - 120	106.4	0.403	20	O
Nitrogen, Nitrate (As N)	4.156	0.200	4	0.1284	101	80 - 120	4.125	0.749	20	
Nitrogen, Nitrite (As N)	4.027	0.200	4	0.2536	94.3	80 - 120	4.001	0.653	20	
Sulfate	39.51	1.00	20	19.27	101	80 - 120	39.34	0.414	20	

The following samples were analyzed in this batch: HS22110582-03 HS22110582-04 HS22110582-05

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422513 (0) **Instrument: TOC_04** **Method: TOTAL ORGANIC CARBON - SM5310B-2011**

MBLK Sample ID: **MBLK-11222022** Units: **mg/L** Analysis Date: **23-Nov-2022 08:00**
Client ID: Run ID: **TOC_04_422513** SeqNo: **6998232** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-11222022** Units: **mg/L** Analysis Date: **23-Nov-2022 08:14**
Client ID: Run ID: **TOC_04_422513** SeqNo: **6998233** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.19	1.00	10	0	102	85 - 115				

LCSD Sample ID: **LCSD-11222022** Units: **mg/L** Analysis Date: **23-Nov-2022 08:28**
Client ID: Run ID: **TOC_04_422513** SeqNo: **6998234** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.34	1.00	10	0	103	85 - 115	10.19	1.46	20	

MS Sample ID: **HS22110582-05MS** Units: **mg/L** Analysis Date: **23-Nov-2022 10:40**
Client ID: **67WW13-221109** Run ID: **TOC_04_422513** SeqNo: **6998244** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	13.22	1.00	10	2.919	103	80 - 120				

The following samples were analyzed in this batch: HS22110582-03 HS22110582-04 HS22110582-05

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: **HS22110582**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 07-Feb-23

Sample Receipt Checklist

Work Order ID: HS22110582 **Date/Time Received:** **10-Nov-2022 09:00**

Client Name: CBI-Houston **Received by:** **Corey Grandits**

Completed By:	/S/ Nelson D. Dusara	10-Nov-2022 11:09	**Reviewed by:**	/S/ Dane J. Wacasey	21-Nov-2022 10:41
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **WATER** Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.8/1.3 C UC/C	IR 31
Cooler(s)/Kit(s):	47194	
Date/Time sample(s) sent to storage:	11/10/2022 10:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS, 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 575-2190 ATTN: Dane Wacasey

HS22110582

Aptim Environmental & Infrastucture, Inc.

LHAAP 67 November 2022

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. 501032
Job: **LHAAP 67 November 2022**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175						Remarks (Preservatives, etc.)	Lab I.D.#
67ww09A-221109	wG	11/9/22 0710		3	X											
67ww10-221109	wG	11/9/22 0755		3	X											
67ww08-221109	wG	11/9/22 0840		12	X	X	X	X	X							
67ww08-221109-FD	wG	11/9/22 0840		12	X	X	X	X	X							
67ww13-221109	wG	11/9/22 0935		12	X	X	X	X	X							
67ww13-221109-MS	wG	11/9/22 0935		12	X	X	X	X	X							
67ww13-221109-MSD	wG	11/9/22 0935		12	X	X	X	X	X							
TRIP BLANK-221109	wG	11/9/22		2	X											

Additional Remarks: **Standard TAT on all parameters. Please email results to** Vicki.Graves@aptim.com **and invoices to** fedinvoices@aptim.com

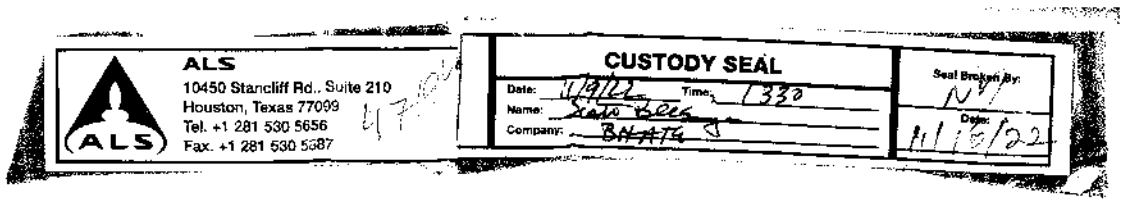
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger											

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

(Word) S:\)-ces\Forms\Chain of Custody - BiWeekly

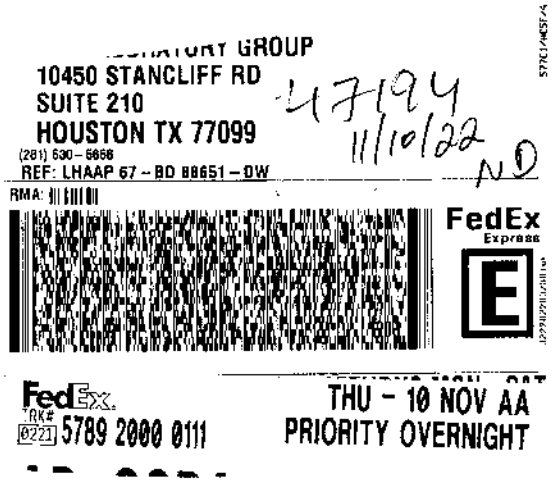


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

47194

CUSTODY SEAL
Date: 11/9/22 Time: 1330
Name: Sato Bees
Company: BHATT

Seal Broken By: NT
Date: 11/10/22



577C1745F/4

[illegible]ORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 67 - BD 88651 - DW

47194
11/10/22
ND

RMA: [illegible]

FedEx Express

FedEx
TRK# 0221 5789 2000 0111

THU - 10 NOV AA
PRIORITY OVERNIGHT

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Dane Wacasey
ALS Group USA, Corp
10450 Stancliff Rd.
Suite 210
Houston Texas 77099

Generated 11/18/2022 11:57:45 AM

JOB DESCRIPTION

HS22110582

JOB NUMBER

410-105413-1

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Definitions/Glossary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Job ID: 410-105413-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-105413-1

Receipt

The samples were received on 11/11/2022 10:10 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.3°C

GC VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Client Sample ID: HS22110582-03 — Lab Sample ID: 410-105413-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	81000		12000	2600	ug/L	1		RSK-175	Total/NA

Client Sample ID: HS22110582-04 — Lab Sample ID: 410-105413-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	90000		12000	2600	ug/L	1		RSK-175	Total/NA

Client Sample ID: HS22110582-05 — Lab Sample ID: 410-105413-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	80000	J1	12000	2600	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Client Sample ID: HS22110582-03

Lab Sample ID: 410-105413-1

Date Collected: 11/09/22 08:40
Matrix: Water
Date Received: 11/11/22 10:10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	81000		12000	2600	ug/L		11/17/22 05:48	11/17/22 09:46	1

Client Sample ID: HS22110582-04

Lab Sample ID: 410-105413-2

Date Collected: 11/09/22 08:40
Matrix: Water
Date Received: 11/11/22 10:10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	90000		12000	2600	ug/L		11/17/22 05:48	11/17/22 09:54	1

Client Sample ID: HS22110582-05

Lab Sample ID: 410-105413-3

Date Collected: 11/09/22 07:10
Matrix: Water
Date Received: 11/11/22 10:10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	80000	J1	12000	2600	ug/L		11/17/22 05:48	11/17/22 10:02	1

QC Sample Results

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 410-318466/1-A
Matrix: Water
Analysis Batch: 318495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 318466

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	2600	U	12000	2600	ug/L		11/17/22 05:48	11/17/22 09:24	1

Lab Sample ID: LCS 410-318466/2-A
Matrix: Water
Analysis Batch: 318495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 318466

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Carbon dioxide	35800	38200		ug/L		107	80 - 122

Lab Sample ID: 410-105413-3 MS
Matrix: Water
Analysis Batch: 318495

Client Sample ID: HS22110582-05
Prep Type: Total/NA
Prep Batch: 318466

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Carbon dioxide	80000	J1	35800	108000	J1	ug/L		77	80 - 122

Lab Sample ID: 410-105413-3 MSD
Matrix: Water
Analysis Batch: 318495

Client Sample ID: HS22110582-05
Prep Type: Total/NA
Prep Batch: 318466

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Carbon dioxide	80000	J1	35800	121000		ug/L		113	80 - 122	11	30

QC Association Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

GC VOA

Prep Batch: 318466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-105413-1	HS22110582-03	Total/NA	Water	RSK-175	
410-105413-2	HS22110582-04	Total/NA	Water	RSK-175	
410-105413-3	HS22110582-05	Total/NA	Water	RSK-175	
MB 410-318466/1-A	Method Blank	Total/NA	Water	RSK-175	
LCS 410-318466/2-A	Lab Control Sample	Total/NA	Water	RSK-175	
410-105413-3 MS	HS22110582-05	Total/NA	Water	RSK-175	
410-105413-3 MSD	HS22110582-05	Total/NA	Water	RSK-175	

Analysis Batch: 318495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-105413-1	HS22110582-03	Total/NA	Water	RSK-175	318466
410-105413-2	HS22110582-04	Total/NA	Water	RSK-175	318466
410-105413-3	HS22110582-05	Total/NA	Water	RSK-175	318466
MB 410-318466/1-A	Method Blank	Total/NA	Water	RSK-175	318466
LCS 410-318466/2-A	Lab Control Sample	Total/NA	Water	RSK-175	318466
410-105413-3 MS	HS22110582-05	Total/NA	Water	RSK-175	318466
410-105413-3 MSD	HS22110582-05	Total/NA	Water	RSK-175	318466

Lab Chronicle

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Client Sample ID: HS22110582-03

Lab Sample ID: 410-105413-1

Date Collected: 11/09/22 08:40

Matrix: Water

Date Received: 11/11/22 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	RSK-175			318466	LXF2	ELLE	11/17/22 05:48
Total/NA	Analysis	RSK-175		1	318495	LXF2	ELLE	11/17/22 09:46

Client Sample ID: HS22110582-04

Lab Sample ID: 410-105413-2

Date Collected: 11/09/22 08:40

Matrix: Water

Date Received: 11/11/22 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	RSK-175			318466	LXF2	ELLE	11/17/22 05:48
Total/NA	Analysis	RSK-175		1	318495	LXF2	ELLE	11/17/22 09:54

Client Sample ID: HS22110582-05

Lab Sample ID: 410-105413-3

Date Collected: 11/09/22 07:10

Matrix: Water

Date Received: 11/11/22 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	RSK-175			318466	LXF2	ELLE	11/17/22 05:48
Total/NA	Analysis	RSK-175		1	318495	LXF2	ELLE	11/17/22 10:02

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-22

Method Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases (GC)	RSK	ELLE
RSK-175	Dissolved Gases Prep	RSK	ELLE

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique , RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-105413-1	HS22110582-03	Water	11/09/22 08:40	11/11/22 10:10
410-105413-2	HS22110582-04	Water	11/09/22 08:40	11/11/22 10:10
410-105413-3	HS22110582-05	Water	11/09/22 07:10	11/11/22 10:10

410-105413 Chain of Custody

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense **COC ID:** 20312

SUBCONTRACT TO:

Eurofins Lancaster Laboratories Envt Testing
2425 New Holland Pike
Lancaster, PA 17601 **Phone:** +1 717 656 2300

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Dane J. Wacasey
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	Dane.Wacasey@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS22110582
TSR:	Ron Martino

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS22110582-03**	**67WW08-221109**	**Groundwater**	**09 Nov 2022 08:40**
	RSK - CO2; Level II & IV, LHAAP EQUIS EDD			28 Nov 2022
2.	**HS22110582-04**	**67WW08-221109-FD**	**Water**	**09 Nov 2022 08:40**
	RSK - CO2; Level II & IV, LHAAP EQUIS EDD			28 Nov 2022
3.	**HS22110582-05**	**67WW13-221109**	**Groundwater**	**09 Nov 2022 07:10**
	RSK - CO2; Level II & IV, LHAAP EQUIS EDD			28 Nov 2022

Comments: HS22110582-05 designate as MS/MSD

Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: Corey G Date/Time: 11/10/22 1800

Received By: Date/Time: 11/11/22 1010

Cooler ID(s): Temperature(s):

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Purchase Order

PO: HS22110582

VENDOR:

Eurofins Lancaster Laboratories Envt Testing
2425 New Holland Pike
Lancaster, PA 17601

Phone: +1 717 656 2300

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Dane J. Wacasey
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	Dane.Wacasey@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	20312
TSR:	Ron Martino

Item	Catalog No	Unit Price	Quantity	Ext Price
1. RSK - CO2; Level II & IV, LHAAP EQUIS EDD	NA	$115.25	3	$345.75
			Order Total:	$345.75

Login Sample Receipt Checklist

Client: ALS Group USA, Corp

Job Number: 410-105413-1

Login Number: 105413

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 1

Creator: McCaskey, Jonathan

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

Eurofins Lancaster Laboratories Environment Testing, LLC

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization

Generated
11/18/2022 11:57:45 AM

Authorized for release by
Kelly Bauer, Project Manager
Kelly.Bauer@et.eurofinsus.com
(717)556-7262

Eurofins Lancaster Laboratories Environment Testing, LLC

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • September 2023

Appendix D

Photographic Log and Well Inspection Forms

PHOTO LOG

Photo No.	Date	Task and Description
1	11-11-2022	Well Inspection, 67WW01
2	11-11-2022	Well Inspection, 67WW02
3	11-11-2022	Well Inspection, 67WW03
4	11-11-2022	Well Inspection, 67WW04
5	11-11-2022	Well Inspection, 67WW05
6	11-11-2022	Well Inspection, 67WW06
7	11-11-2022	Well Inspection, 67WW07
8	11-11-2022	Well Inspection, 67WW08
9	11-11-2022	Well Inspection, 67WW09
10	11-11-2022	Well Inspection, 67WW09A
11	11-11-2022	Well Inspection, 67WW10
12	11-11-2022	Well Inspection, 67WW11
13	11-11-2022	Well Inspection, 67WW12
14	11-11-2022	Well Inspection, 67WW13
15	11-11-2022	Well Inspection, 67WW14
16	11-11-2022	Well Inspection, 67WW15
17	11-11-2022	Well Inspection, 67WW16I
18	11-11-2022	Well Inspection, 67WW17
19	11-11-2022	Well Inspection, 67WW18

PHOTO 1: Well Inspection, 67WW01
DATE: November 11, 2022

PHOTO 2: Well Inspection, 67WW02
DATE: November 11, 2022

PHOTO 3: Well Inspection, 67WW03
DATE: November 11, 2022

PHOTO 4: Well Inspection, 67WW04
DATE: November 11, 2022

PHOTO 5: Well Inspection, 67WW05
DATE: November 11, 2022

PHOTO 6: Well Inspection, 67WW06
DATE: November 11, 2022

PHOTO 7: Well Inspection, 67WW07
DATE: November 11, 2022

PHOTO 8: Well Inspection, 67WW08
DATE: November 11, 2022

PHOTO 9: Well Inspection, 67WW09
DATE: November 11, 2022

PHOTO 10: Well Inspection, 67WW09A
DATE: November 11, 2022

PHOTO 11: Well Inspection, 67WW10
DATE: November 11, 2022

PHOTO 12: Well Inspection, 67WW11
DATE: November 11, 2022

PHOTO 13: Well Inspection, 67WW12
DATE: November 11, 2022

PHOTO 14: Well Inspection, 67WW13
DATE: November 11, 2022

PHOTO 15: Well Inspection, 67WW14
DATE: November 11, 2022

PHOTO 16: Well Inspection, 67WW15
DATE: November 11, 2022

PHOTO 17: Well Inspection, 67WW16I
DATE: November 11, 2022

PHOTO 18: Well Inspection, 67WW17
DATE: November 11, 2022

PHOTO 19: Well Inspection, 67WW18
DATE: November 11, 2022

01190540

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67WW14
Inspection Date: 11/7/22
Well Completion Depth/ Measured Depth: 30.51
Inspector: Scott Baesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190541

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARmy
Site Name: 67
Well ID: 67WW05
Inspection Date: 11/7/22
Well Completion Depth/ Measured Depth: 30.06
Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190542

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW18
Inspection Date: 11/7/22
Well Completion Depth/ Measured Depth: 43.43
Inspector: Scott Beasinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190543

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW17
Inspection Date: 11/7/22
Well Completion Depth/ Measured Depth: 29.94
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190544

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67MW02
Inspection Date: 11/7/22
Well Completion Depth/ Measured Depth: 27.80
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED**
Well cover present? N.A. ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190545

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67WW15
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 22.80
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☒ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190546

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW09
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 37.38
Inspector: Scott Beesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190547

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67WW11
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 46.60
Inspector: Scott Beasinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: metal
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190548

WELL INSPECTION FORM

Job Name: LTAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW16I
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 80.37
Inspector: Scott Beasinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190549

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW01
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 26.95
Inspector: Scott Beasinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED** NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190550

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW03
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 24.88
Inspector: Scott Beasinger

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA. ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190551

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW12
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 36.18
Inspector: Scott Bassinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190552

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW07
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 27.80
Inspector: Scott Baysinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED**
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches) 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190553

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW06
Inspection Date: 11/8/22
Well Completion Depth/ Measured Depth: 47.19
Inspector: Scott Baggenbank

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190554

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67WW04
Inspection Date: 11/9/22
Well Completion Depth/ Measured Depth: 24.38
Inspector: Scott Beesinger

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ **FLUSH MOUNTED**
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190555

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67WW09A
Inspection Date: 11/9/22
Well Completion Depth/ Measured Depth: 38.62
Inspector: Scott Baggenstoss

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☐ Good ☐ Less than 50% rusted ☒ More than 50% rusted

☐ FLUSH MOUNTED
Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 2"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190556

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: Army
Site Name: 67
Well ID: 67MW10
Inspection Date: 11/9/22
Well Completion Depth/ Measured Depth: 50.58
Inspector: Scott Baggenaar

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED

Well cover present? NA ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190557

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW08
Inspection Date: 11/9/22
Well Completion Depth/ Measured Depth: 51.87
Inspector: Scott Baesinger

ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA

Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:

Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☒ Yes ☐ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

01190558

WELL INSPECTION FORM

Job Name: LHAAP
Job No.: 501032
Client: ARMY
Site Name: 67
Well ID: 67WW13
Inspection Date: 11/9/22
Well Completion Depth/ Measured Depth: 28.53
Inspector: Scott Beggingar

ABOVE GROUND
Well Accessible? ☒ Yes ☐ No
Protective casing? ☒ Yes ☐ No
Material: METAL
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Need Paint
Lid Condition: ☒ Good ☐ Broken ☐ Cracked
Hinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted

☐ FLUSH MOUNTED NA
Well cover present? ☐ Yes ☐ No
Condition: ☐ Good ☐ Broken ☐ Cracked
Condition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:
Sloped away from casing? ☒ Yes ☐ No
Pad Area Cleared of Vegetation? ☒ Yes ☐ No
Check any of the following features that apply:
☐ Many Cracks ☐ Gap Around Casing ☐ Few Cracks ☐ Ponded Water ☐ No Pad Present

WELL CONDITION:
Inner Diameter (inches): 4"
Condition: ☒ Good ☐ Broken ☐ Cracked ☐ Other (describe)
Cap present? ☒ Yes ☐ No
Well lock present? ☒ Yes ☐ No
Lock functioning properly? ☒ Yes ☐ No
Are bollards present and stable? ☒ Yes ☐ No
Well ID visible? ☒ Yes ☐ No

WELL INTEGRITY:
Bailer present? ☐ Yes ☒ No
Visual obstruction? ☐ Yes ☒ No
Is well open to completed depth? (complete when gauging) ☒ Yes ☐ No
Is silt present in well? (complete when gauging) ☐ Yes ☒ No
Is silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • September 2023

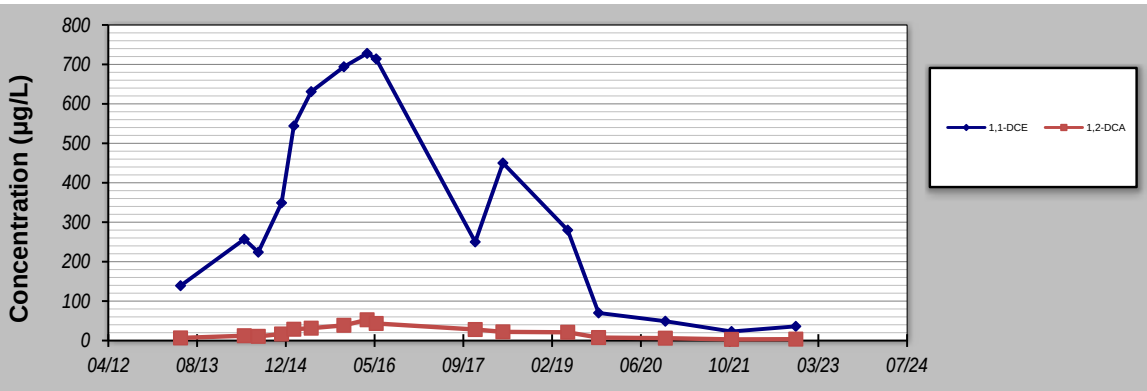
Appendix E

Mann-Kendall Trend Test Results

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	15-Feb-23	Job ID:	501032
Facility Name:	LHAAP-67	Constituent:	67WW01
Conducted By:	Rebecca Lenz	Concentration Units:	µg/L

Sampling Point ID:	1,1-DCE	1,2-DCA					
Sampling Event	Sampling Date	67WW01 CONCENTRATION (µg/L)					
1	13-May-13	139	6.7				
2	7-May-14	257	12				
3	25-Jul-14	224	11				
4	3-Dec-14	349	17				
5	10-Feb-15	544	29				
6	19-May-15	631	31				
7	19-Nov-15	694	39				
8	29-Mar-16	728	53				
9	19-May-16	714	43				
10	28-Nov-17	250	28				
11	3-May-18	450	22				
12	3-May-19	280	21				
13	24-Oct-19	70	7.6				
14	3-Nov-20	49	6.1				
15	11-Nov-21	23	3.0				
16	8-Nov-22	36	3.6				
17							
18							
19							
20							
Coefficient of Variation:		0.75	0.73				
Mann-Kendall Statistic (S):		-28	-24				
Confidence Factor:		88.6%	84.7%				
Concentration Trend:		Stable	Stable				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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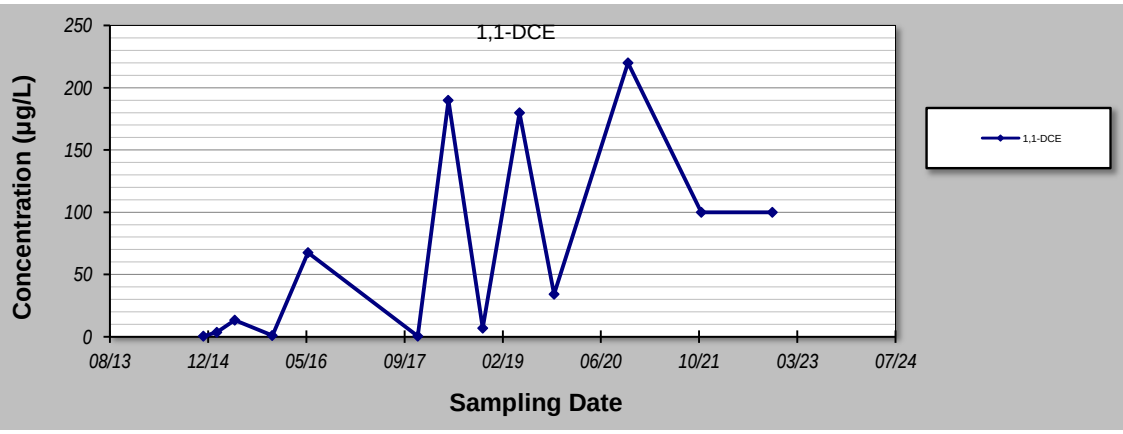
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **15-Feb-23**
Facility Name: **LHAAP-67**
Conducted By: **Rebecca Lenz**

Job ID: **501032**
Constituent: **67WW02**
Concentration Units: **µg/L**

Sampling Point ID: **1,1-DCE**

Sampling Event	Sampling Date	67WW02 CONCENTRATION (µg/L)
1	3-Dec-14	0.5
2	10-Feb-15	3.59
3	12-May-15	13.2
4	19-Nov-15	0.86
5	19-May-16	68
6	28-Nov-17	0.5
7	3-May-18	190
8	25-Oct-18	6.9
9	1-May-19	180
10	24-Oct-19	34
11	3-Nov-20	220
12	11-Nov-21	100
13	7-Nov-22	100
14		
15		
16		
17		
18		
19		
20		
Coefficient of Variation:		**1.14**
Mann-Kendall Statistic (S):		**38**
Confidence Factor:		**98.9%**
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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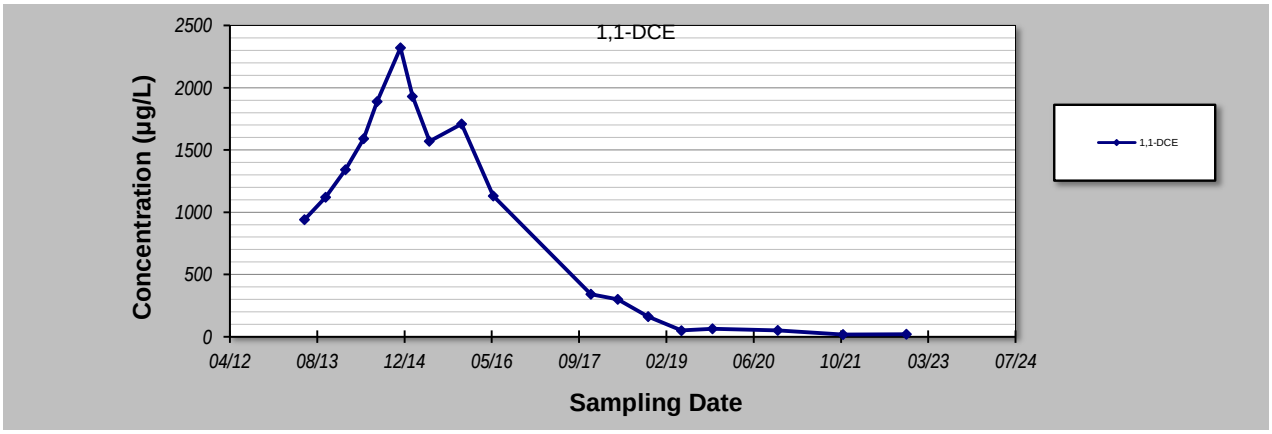
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	15-Feb-23	Job ID:	501032
Facility Name:	LHAAP-67	Constituent:	67WW08
Conducted By:	Rebecca Lenz	Concentration Units:	µg/L

Sampling Point ID: 1,1-DCE

Sampling Event	Sampling Date	67WW08 CONCENTRATION (µg/L)
1	3-Jun-13	940
2	2-Oct-13	1,120
3	23-Jan-14	1,340
4	7-May-14	1,590
5	24-Jul-14	1,890
6	4-Dec-14	2,320
7	11-Feb-15	1,930
8	19-May-15	1,570
9	19-Nov-15	1,710
10	19-May-16	1,130
11	28-Nov-17	340
12	1-May-18	300
13	23-Oct-18	160
14	1-May-19	49
15	27-Oct-19	63
16	3-Nov-20	50
17	11-Nov-21	18
18	9-Nov-22	19
19		
20		
Coefficient of Variation:		0.87
Mann-Kendall Statistic (S):		-87
Confidence Factor:		>99.9%
Concentration Trend:		Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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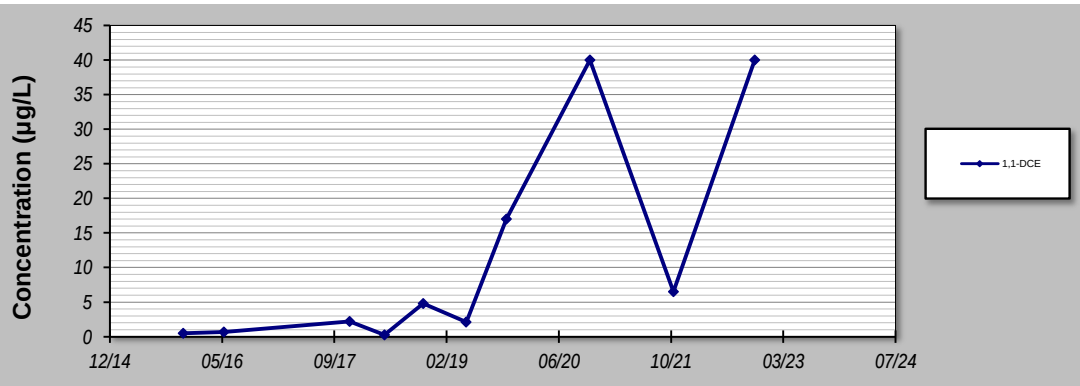
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **15-Feb-23**
Facility Name: **LHAAP-67**
Conducted By: **Rebecca Lenz**

Job ID: **501032**
Constituent: **67WW12**
Concentration Units: **µg/L**

Sampling Point ID: **1,1-DCE**

Sampling Event	Sampling Date	67WW12 CONCENTRATION (µg/L)
1	18-Nov-15	0.5
2	18-May-16	0.681
3	29-Nov-17	2.2
4	3-May-18	0.25
5	22-Oct-18	4.8
6	2-May-19	2.1
7	28-Oct-19	17
8	3-Nov-20	40
9	10-Nov-21	6.5
10	8-Nov-22	40
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
Coefficient of Variation:		**1.39**
Mann-Kendall Statistic (S):		**30**
Confidence Factor:		**99.7%**
Concentration Trend:		Increasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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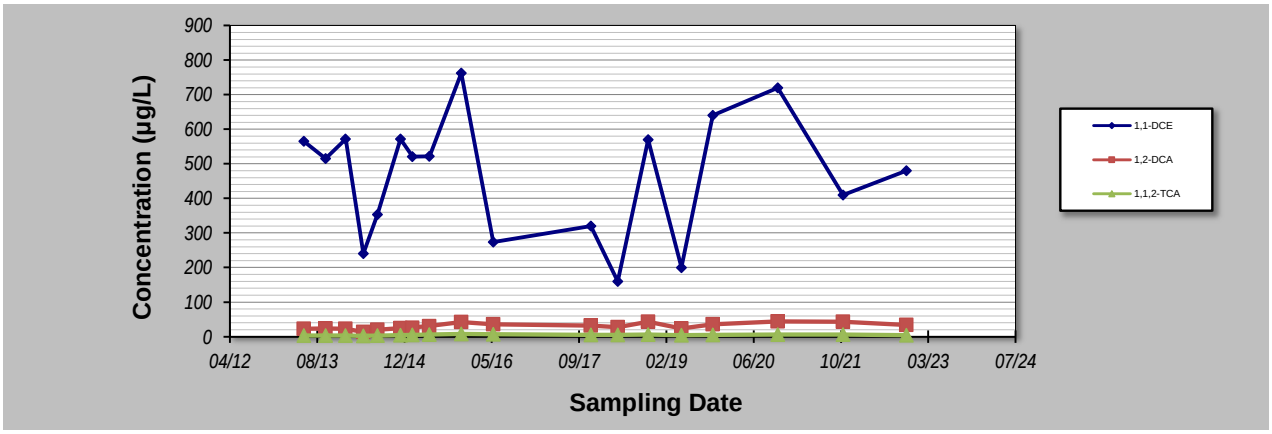
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	15-Feb-23	Job ID:	501032
Facility Name:	LHAAP-67	Constituent:	67WW13
Conducted By:	Rebecca Lenz	Concentration Units:	µg/L

Sampling Point ID:	1,1-DCE	1,2-DCA	1,1,2-TCA				
Sampling Event	Sampling Date	67WW13 CONCENTRATION (µg/L)						
1	31-May-13	565	23.1	2.91				
2	1-Oct-13	515	23.8	3.37				
3	24-Jan-14	572	22.9	2.99				
4	6-May-14	240	13.7	1.99				
5	25-Jul-14	353	19.8	3.48				
6	4-Dec-14	572	24.9	4.4				
7	11-Feb-15	521	26	4.87				
8	19-May-15	522	30.6	5.96				
9	18-Nov-15	762	42.6	7.66				
10	19-May-16	274	35.7	7				
11	28-Nov-17	320	32	5.1				
12	1-May-18	160	27	4.8				
13	23-Oct-18	570	43	6.1				
14	1-May-19	200	24	3.9				
15	28-Oct-19	640	36	5				
16	3-Nov-20	720	44	5.7				
17	11-Nov-21	410	43	5.9				
18	9-Nov-22	480	34	4.3				
19								
20								
Coefficient of Variation:		0.38	0.30	0.31				
Mann-Kendall Statistic (S):		-2	88	59				
Confidence Factor:		51.5%	>99.9%	98.7%				
Concentration Trend:		Stable	Increasing	Increasing				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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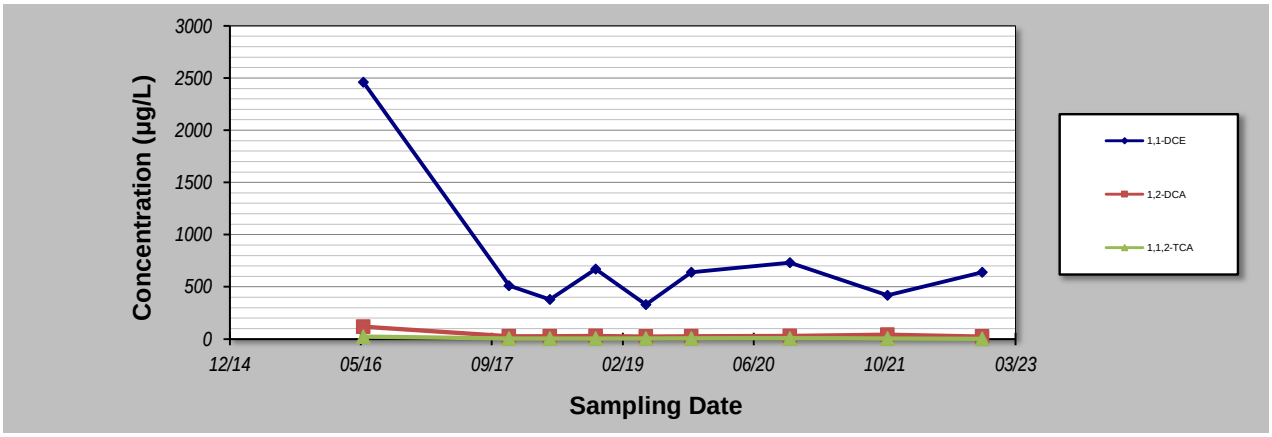
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	15-Feb-23	Job ID:	501032
Facility Name:	LHAAP-67	Constituent:	67WW15
Conducted By:	Rebecca Lenz	Concentration Units:	µg/L

Sampling Point ID:	1,1-DCE	1,2-DCA	1,1,2-TCA				
Sampling Event	Sampling Date	67WW15 CONCENTRATION (µg/L)						
1	19-May-16	2,460	117	22.7				
2	27-Nov-17	510	27	5.6				
3	2-May-18	380	26	5.6				
4	23-Oct-18	670	30	6.0				
5	3-May-19	330	22	5.4				
6	24-Oct-19	640	27	6.4				
7	3-Nov-20	730	29	6.4				
8	11-Nov-21	420	43	5.7				
9	8-Nov-22	640	24	3.2				
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.87	0.79	0.78				
Mann-Kendall Statistic (S):		-3	-5	-8				
Confidence Factor:		58.0%	65.7%	76.2%				
Concentration Trend:		Stable	Stable	Stable				



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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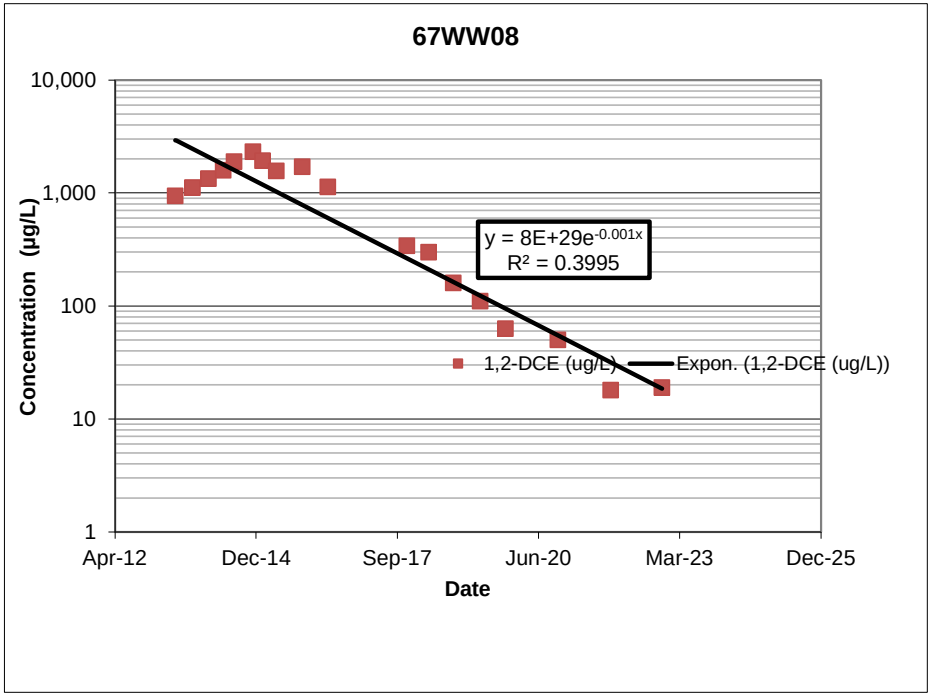
Appendix F

Regression Analysis

Time-Dependent Attenuation Rate Constant and Estimated Cleanup Time
67WW08

Date	1,1-DCE (µg/L)
3-Jun-13	940
2-Oct-13	1,120
23-Jan-14	1,340
7-May-14	1,590
24-Jul-14	1,890
4-Dec-14	2,320
11-Feb-15	1,930
19-May-15	1,570
19-Nov-15	1,710
19-May-16	1,130
28-Nov-17	340
1-May-18	300
23-Oct-18	160
1-May-19	110
27-Oct-19	63
3-Nov-20	50
11-Nov-21	18
9-Nov-22	19



Chemical	Attenuation Rate Constant (day^{-1})	Attenuation Half-life (days)	Attenuation Half-life (years)	Current Conc. (µg/L)	Target Concentration (µg/L)	Estimated Cleanup Time (years)
1,1-DCE	0.0010	693.1	1.9	19	7	2.7

Notes:
The estimated cleanup time was calculated as the time it would take the most recent detected COC concentration to reach the MCL using the site-specific attenuation rate, and assuming first order degradation kinetics.
µg/L - micrograms per liter
DCA - dichloroethane
DCE - dichloroethene
MCL - maximum contaminant level
NA - not applicable because the concentration is below the Target Concentration

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WorkOrder: HS22110553

LHAAP 67 November 2022

Aptim Environmental & Infrastucture, Inc.

Vicki Graves
10333 Richmond Ave Ste 1030
Houston TX 77042

29-Nov-2022

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HS22110553 LHAAP 67 November 2022 Final

ALS WO# HS22110553

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November 15, 2022

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22110553**

Laboratory Results for: **LHAAP 67 November 2022**

Dear Vicki Graves ,

ALS Environmental received 14 sample(s) on Nov 09, 2022 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Dane J. Wacasey

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Work Order: HS22110553

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22110553-01	67WW14-221107	GW		07-Nov-2022 08:55	09-Nov-2022 09:15	☐
HS22110553-02	67WW05-221107	GW		07-Nov-2022 09:35	09-Nov-2022 09:15	☐
HS22110553-03	67WW18-221107	GW		07-Nov-2022 10:25	09-Nov-2022 09:15	☐
HS22110553-04	67WW17-221107	GW		07-Nov-2022 11:10	09-Nov-2022 09:15	☐
HS22110553-05	67WW02-221107	GW		07-Nov-2022 12:10	09-Nov-2022 09:15	☐
HS22110553-06	67WW15-221108	GW		08-Nov-2022 07:00	09-Nov-2022 09:15	☐
HS22110553-07	67WW09-221108	GW		08-Nov-2022 07:45	09-Nov-2022 09:15	☐
HS22110553-08	67WW11-221108	GW		08-Nov-2022 08:30	09-Nov-2022 09:15	☐
HS22110553-09	67WW16I-221108	GW		08-Nov-2022 09:20	09-Nov-2022 09:15	☐
HS22110553-10	67WW16I-221108-FD	GW		08-Nov-2022 09:20	09-Nov-2022 09:15	☐
HS22110553-11	67WW01-221108	GW		08-Nov-2022 10:05	09-Nov-2022 09:15	☐
HS22110553-12	67WW12-221108	GW		08-Nov-2022 10:50	09-Nov-2022 09:15	☐
HS22110553-13	67WW07-221108	GW		08-Nov-2022 11:35	09-Nov-2022 09:15	☐
HS22110553-14	Trip Blank-221108	Water		08-Nov-2022 00:00	09-Nov-2022 09:15	☐

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 67 November 2022
Work Order: HS22110553

GCMS Volatiles by Method SW8260

Batch ID: R421680

Sample ID: 67WW05-221107 (HS22110553-02)

• Surrogate Dibromofluoromethane exceeded recovery limits. Sample is ND.

Sample ID: 67WW16I-221108-FD (HS22110553-10)

• Surrogate Dibromofluoromethane exceeded recovery limits. Sample is ND.

Sample ID: HS22110430-06MS

• MS and MSD are for an unrelated sample

Batch ID: R421783

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW14-221107
Collection Date: 07-Nov-2022 08:55

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,1-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 16:42
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:42
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 16:42
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 16:42
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:42
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 16:42
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW14-221107
Collection Date: 07-Nov-2022 08:55

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-01
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:42
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:42
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:42
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:42
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 16:42*
Surr: 4-Bromofluorobenzene	*99.8*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 16:42*
Surr: Dibromofluoromethane	*118*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 16:42*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 16:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW05-221107
Collection Date: 07-Nov-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:02
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 17:02
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 17:02
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:02
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 17:02
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW05-221107
Collection Date: 07-Nov-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-02
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:02
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:02
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:02
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:02
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 17:02*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 17:02*
Surr: Dibromofluoromethane	*119*	*S*		**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 17:02*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 17:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW18-221107
Collection Date: 07-Nov-2022 10:25

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:23
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 17:23
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 17:23
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:23
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 17:23
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW18-221107
Collection Date: 07-Nov-2022 10:25

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-03
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:23
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:23
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:23
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:23
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 17:23*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 17:23*
Surr: Dibromofluoromethane	*117*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 17:23*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 17:23*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW17-221107
Collection Date: 07-Nov-2022 11:10

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-04
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:43
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 17:43
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 17:43
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:43
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 17:43
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW17-221107
Collection Date: 07-Nov-2022 11:10

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-04
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 17:43
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 17:43
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 17:43
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 17:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 17:43
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 17:43*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 17:43*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 17:43*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 17:43*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW02-221107
Collection Date: 07-Nov-2022 12:10

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,1-Dichloroethane	**4.5**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:07
1,1-Dichloroethene	**100**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:07
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:07
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 20:07
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 20:07
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:07
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 20:07
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW02-221107
Collection Date: 07-Nov-2022 12:10

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-05
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:07
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:07
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:07
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:07
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 20:07*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 20:07*
Surr: Dibromofluoromethane	*114*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 20:07*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 20:07*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW15-221108
Collection Date: 08-Nov-2022 07:00

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-06
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,1,2-Trichloroethane	**3.2**		**0.30**	**1.0**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
1,1-Dichloroethane	**9.9**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
1,1-Dichloroethene	**640**		**2.0**	**5.0**	**10**	**ug/L**	10	14-Nov-2022 13:10
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,2-Dichloroethane	**24**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:47
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 20:47
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 20:47
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:47
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 20:47
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW15-221108 Lab ID:HS22110553-06
Collection Date: 08-Nov-2022 07:00 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
cis-1,2-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:47
Methylene chloride	**3.3**		**0.40**	**2.0**	**2.0**	**ug/L**	1	13-Nov-2022 20:47
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:47
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Trichloroethene	**1.4**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:47
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:47
Surr: 1,2-Dichloroethane-d4	*114*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*10*	*14-Nov-2022 13:10*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*10*	*14-Nov-2022 13:10*
Surr: Dibromofluoromethane	*112*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: Dibromofluoromethane	*118*			**0**	*80-119*	*%REC*	*10*	*14-Nov-2022 13:10*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 20:47*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*14-Nov-2022 13:10*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110553
Sample ID: 67WW09-221108 Lab ID:HS22110553-07
Collection Date: 08-Nov-2022 07:45 Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:04
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 18:04
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 18:04
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:04
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 18:04
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW09-221108
Collection Date: 08-Nov-2022 07:45

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-07
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:04
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:04
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:04
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:04
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 18:04*
Surr: 4-Bromofluorobenzene	*97.6*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 18:04*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 18:04*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 18:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW11-221108
Collection Date: 08-Nov-2022 08:30

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-08
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:24
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 18:24
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 18:24
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:24
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 18:24
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW11-221108
Collection Date: 08-Nov-2022 08:30

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-08
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:24
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:24
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:24
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:24
Surr: 1,2-Dichloroethane-d4	*109*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 18:24*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 18:24*
Surr: Dibromofluoromethane	*115*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 18:24*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 18:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW16I-221108
Collection Date: 08-Nov-2022 09:20

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-09
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:45
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 18:45
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 18:45
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:45
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 18:45
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW16I-221108
Collection Date: 08-Nov-2022 09:20

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-09
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 18:45
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 18:45
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 18:45
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 18:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 18:45
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 18:45*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 18:45*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 18:45*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 18:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW16I-221108-FD
Collection Date: 08-Nov-2022 09:20

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-10
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:05
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 19:05
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 19:05
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:05
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 19:05
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW16I-221108-FD
Collection Date: 08-Nov-2022 09:20

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-10
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:05
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:05
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:05
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:05
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 19:05*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 19:05*
Surr: Dibromofluoromethane	*122*	*S*		**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 19:05*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 19:05*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW01-221108
Collection Date: 08-Nov-2022 10:05

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-11
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,1-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 19:26
1,1-Dichloroethene	**36**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 19:26
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,2-Dichloroethane	**3.6**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 19:26
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:26
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 19:26
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 19:26
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:26
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 19:26
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW01-221108
Collection Date: 08-Nov-2022 10:05

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-11
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:26
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:26
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:26
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:26
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 19:26*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 19:26*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 19:26*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 19:26*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW12-221108
Collection Date: 08-Nov-2022 10:50

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-12
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,1-Dichloroethene	**40**		**0.20**	**0.50**	**1.0**	**ug/L**	1	13-Nov-2022 20:27
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:27
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 20:27
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 20:27
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:27
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 20:27
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW12-221108
Collection Date: 08-Nov-2022 10:50

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-12
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 20:27
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 20:27
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 20:27
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 20:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 20:27
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 20:27*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 20:27*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 20:27*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 20:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW07-221108
Collection Date: 08-Nov-2022 11:35

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-13
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:46
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 19:46
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 19:46
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:46
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 19:46
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW07-221108
Collection Date: 08-Nov-2022 11:35

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-13
Matrix:GW

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 19:46
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 19:46
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 19:46
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 19:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 19:46
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 19:46*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 19:46*
Surr: Dibromofluoromethane	*119*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 19:46*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 19:46*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: Trip Blank-221108
Collection Date: 08-Nov-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-14
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:01
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
2-Hexanone	2.0	U	1.0	2.0	2.0	ug/L	1	13-Nov-2022 16:01
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
4-Methyl-2-pentanone	2.0	U	0.70	2.0	2.0	ug/L	1	13-Nov-2022 16:01
Acetone	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:01
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Carbon disulfide	2.0	U	0.60	2.0	2.0	ug/L	1	13-Nov-2022 16:01
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: Trip Blank-221108
Collection Date: 08-Nov-2022 00:00

ANALYTICAL REPORT
WorkOrder:HS22110553
Lab ID:HS22110553-14
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
cis-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	13-Nov-2022 16:01
Methylene chloride	2.0	U	0.40	2.0	2.0	ug/L	1	13-Nov-2022 16:01
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	13-Nov-2022 16:01
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	13-Nov-2022 16:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	13-Nov-2022 16:01
Surr: 1,2-Dichloroethane-d4	*113*			**0**	*81-118*	*%REC*	*1*	*13-Nov-2022 16:01*
Surr: 4-Bromofluorobenzene	*98.8*			**0**	*85-114*	*%REC*	*1*	*13-Nov-2022 16:01*
Surr: Dibromofluoromethane	*118*			**0**	*80-119*	*%REC*	*1*	*13-Nov-2022 16:01*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*13-Nov-2022 16:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R421680 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22110553-14	Trip Blank-221108	08 Nov 2022 00:00			13 Nov 2022 16:01	1
Batch ID: R421680 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS22110553-01	67WW14-221107	07 Nov 2022 08:55			13 Nov 2022 16:42	1
HS22110553-02	67WW05-221107	07 Nov 2022 09:35			13 Nov 2022 17:02	1
HS22110553-03	67WW18-221107	07 Nov 2022 10:25			13 Nov 2022 17:23	1
HS22110553-04	67WW17-221107	07 Nov 2022 11:10			13 Nov 2022 17:43	1
HS22110553-05	67WW02-221107	07 Nov 2022 12:10			13 Nov 2022 20:07	1
HS22110553-06	67WW15-221108	08 Nov 2022 07:00			13 Nov 2022 20:47	1
HS22110553-07	67WW09-221108	08 Nov 2022 07:45			13 Nov 2022 18:04	1
HS22110553-08	67WW11-221108	08 Nov 2022 08:30			13 Nov 2022 18:24	1
HS22110553-09	67WW16I-221108	08 Nov 2022 09:20			13 Nov 2022 18:45	1
HS22110553-10	67WW16I-221108-FD	08 Nov 2022 09:20			13 Nov 2022 19:05	1
HS22110553-11	67WW01-221108	08 Nov 2022 10:05			13 Nov 2022 19:26	1
HS22110553-12	67WW12-221108	08 Nov 2022 10:50			13 Nov 2022 20:27	1
HS22110553-13	67WW07-221108	08 Nov 2022 11:35			13 Nov 2022 19:46	1
Batch ID: R421783 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** GW	
HS22110553-06	67WW15-221108	08 Nov 2022 07:00			14 Nov 2022 13:10	10

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 13:17**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	2.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	2.0	2.0								U
Acetone	2.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	1.0	1.0								U

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 13:17**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	1.0	1.0								U
Carbon disulfide	2.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	2.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*54.85*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49*	*1.0*	*50*	*0*	*98.0*	*85 - 114*				
Surr: Dibromofluoromethane	*56.53*	*1.0*	*50*	*0*	*113*	*80 - 119*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 13:17**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978296** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.11*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 12:36**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978295** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.57	1.0	20	0	92.9	78 - 124				
1,1,1-Trichloroethane	20	1.0	20	0	100	74 - 131				
1,1,2,2-Tetrachloroethane	19.76	1.0	20	0	98.8	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	17.16	1.0	20	0	85.8	70 - 136				
1,1,2-Trichloroethane	19.49	1.0	20	0	97.4	80 - 119				
1,1-Dichloroethane	24.53	1.0	20	0	123	77 - 125				
1,1-Dichloroethene	16.37	1.0	20	0	81.8	71 - 131				
1,1-Dichloropropene	20.52	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	19.76	1.0	20	0	98.8	69 - 129				
1,2,3-Trichloropropane	16.54	1.0	20	0	82.7	73 - 122				
1,2,4-Trichlorobenzene	19.86	1.0	20	0	99.3	69 - 130				
1,2,4-Trimethylbenzene	18.25	1.0	20	0	91.3	76 - 124				
1,2-Dibromo-3-chloropropane	18.06	1.0	20	0	90.3	62 - 128				
1,2-Dibromoethane	18.99	1.0	20	0	94.9	77 - 121				
1,2-Dichlorobenzene	19.97	1.0	20	0	99.8	80 - 119				
1,2-Dichloroethane	20.31	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	20.37	1.0	20	0	102	78 - 122				
1,3,5-Trimethylbenzene	18.25	1.0	20	0	91.2	75 - 124				
1,3-Dichlorobenzene	17.66	1.0	20	0	88.3	80 - 119				
1,3-Dichloropropane	19.94	1.0	20	0	99.7	80 - 119				
1,4-Dichlorobenzene	20.19	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	21.85	1.0	20	0	109	60 - 139				
2-Butanone	41.04	2.0	40	0	103	56 - 143				
2-Chlorotoluene	19.98	1.0	20	0	99.9	79 - 122				
2-Hexanone	40.34	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.77	1.0	20	0	93.8	78 - 122				
4-Isopropyltoluene	17.4	1.0	20	0	87.0	77 - 127				
4-Methyl-2-pentanone	37.85	2.0	40	0	94.6	67 - 130				
Acetone	28.42	2.0	40	0	71.0	39 - 160				
Benzene	20	1.0	20	0	100.0	79 - 120				
Bromobenzene	19.48	1.0	20	0	97.4	80 - 120				
Bromochloromethane	23.01	1.0	20	0	115	78 - 123				
Bromodichloromethane	19.67	1.0	20	0	98.3	79 - 125				
Bromoform	19.64	1.0	20	0	98.2	66 - 130				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 12:36**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978295** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	17.52	1.0	20	0	87.6	53 - 141				
Carbon disulfide	32.48	2.0	40	0	81.2	64 - 133				
Carbon tetrachloride	19.36	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.91	1.0	20	0	89.6	82 - 118				
Chloroethane	19.44	1.0	20	0	97.2	60 - 138				
Chloroform	20.27	1.0	20	0	101	79 - 124				
Chloromethane	20.9	1.0	20	0	104	50 - 139				
cis-1,2-Dichloroethene	21.45	1.0	20	0	107	78 - 123				
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	75 - 124				
Dibromochloromethane	18.83	1.0	20	0	94.1	74 - 126				
Dibromomethane	19.92	1.0	20	0	99.6	79 - 123				
Dichlorodifluoromethane	19.6	1.0	20	0	98.0	32 - 152				
Ethylbenzene	18.12	1.0	20	0	90.6	79 - 121				
Hexachlorobutadiene	23.48	1.0	20	0	117	66 - 134				
Isopropylbenzene	17.14	1.0	20	0	85.7	72 - 131				
m,p-Xylene	36.9	2.0	40	0	92.3	80 - 121				
Methylene chloride	16.36	2.0	20	0	81.8	74 - 124				
Naphthalene	18.5	1.0	20	0	92.5	61 - 128				
n-Butylbenzene	17.29	1.0	20	0	86.4	75 - 128				
n-Propylbenzene	18.47	1.0	20	0	92.3	76 - 126				
o-Xylene	18.8	1.0	20	0	94.0	78 - 122				
sec-Butylbenzene	16.97	1.0	20	0	84.9	77 - 126				
Styrene	17.97	1.0	20	0	89.9	78 - 123				
tert-Butylbenzene	16.99	1.0	20	0	84.9	78 - 124				
Tetrachloroethene	18.18	1.0	20	0	90.9	74 - 129				
Toluene	19.56	1.0	20	0	97.8	80 - 121				
trans-1,2-Dichloroethene	20.88	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	19.72	1.0	20	0	98.6	73 - 127				
Trichloroethene	19.74	1.0	20	0	98.7	79 - 123				
Trichlorofluoromethane	18.67	1.0	20	0	93.4	65 - 141				
Vinyl chloride	18.43	1.0	20	0	92.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.46*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.45*	*1.0*	*50*	*0*	*96.9*	*85 - 114*				
Surr: Dibromofluoromethane	*54.85*	*1.0*	*50*	*0*	*110*	*80 - 119*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221113** Units: **ug/L** Analysis Date: **13-Nov-2022 12:36**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978295** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.17*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110430-06MS** Units: **ug/L** Analysis Date: **13-Nov-2022 13:58**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978298** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	101.8	5.0	100	0	102	78 - 124				
1,1,1-Trichloroethane	122	5.0	100	0	122	74 - 131				
1,1,2,2-Tetrachloroethane	98.04	5.0	100	0	98.0	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	192.7	5.0	100	0	193	70 - 136				S
1,1,2-Trichloroethane	103.1	5.0	100	0	103	80 - 119				
1,1-Dichloroethane	85.89	5.0	100	0	85.9	77 - 125				
1,1-Dichloroethene	154.3	5.0	100	0	154	71 - 131				S
1,1-Dichloropropene	132.5	5.0	100	0	133	78 - 125				S
1,2,3-Trichlorobenzene	105.1	5.0	100	0	105	69 - 129				
1,2,3-Trichloropropane	87.69	5.0	100	0	87.7	73 - 122				
1,2,4-Trichlorobenzene	107.7	5.0	100	0	108	69 - 130				
1,2,4-Trimethylbenzene	107.9	5.0	100	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	89.85	5.0	100	0	89.8	62 - 128				
1,2-Dibromoethane	100.4	5.0	100	0	100	77 - 121				
1,2-Dichlorobenzene	106.4	5.0	100	0	106	80 - 119				
1,2-Dichloroethane	102.7	5.0	100	0	103	73 - 128				
1,2-Dichloropropane	105.3	5.0	100	0	105	78 - 122				
1,3,5-Trimethylbenzene	115.4	5.0	100	0	115	75 - 124				
1,3-Dichlorobenzene	101	5.0	100	0	101	80 - 119				
1,3-Dichloropropane	105.4	5.0	100	0	105	80 - 119				
1,4-Dichlorobenzene	111.2	5.0	100	0	111	79 - 118				
2,2-Dichloropropane	129.1	5.0	100	0	129	60 - 139				
2-Butanone	191	10	200	0	95.5	56 - 143				
2-Chlorotoluene	115.2	5.0	100	0	115	79 - 122				
2-Hexanone	199.7	10	200	0	99.9	57 - 139				
4-Chlorotoluene	109.4	5.0	100	0	109	78 - 122				
4-Isopropyltoluene	117.4	5.0	100	0	117	77 - 127				
4-Methyl-2-pentanone	189.8	10	200	0	94.9	67 - 130				
Acetone	243.5	10	200	0	122	39 - 160				
Benzene	112.2	5.0	100	0	112	79 - 120				
Bromobenzene	103.7	5.0	100	0	104	80 - 120				
Bromochloromethane	116	5.0	100	0	116	78 - 123				
Bromodichloromethane	107.2	5.0	100	0	107	79 - 125				
Bromoform	100.8	5.0	100	0	101	66 - 130				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110430-06MS** Units: **ug/L** Analysis Date: **13-Nov-2022 13:58**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978298** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	86.95	5.0	100	0	86.9	53 - 141				
Carbon disulfide	296.9	10	200	0	148	64 - 133				S
Carbon tetrachloride	131.2	5.0	100	0	131	72 - 136				
Chlorobenzene	105.5	5.0	100	0	105	82 - 118				
Chloroethane	118.8	5.0	100	0	119	60 - 138				
Chloroform	107.9	5.0	100	0	108	79 - 124				
Chloromethane	104.9	5.0	100	0	105	50 - 139				
cis-1,2-Dichloroethene	117.6	5.0	100	0	118	78 - 123				
cis-1,3-Dichloropropene	107.7	5.0	100	0	108	75 - 124				
Dibromochloromethane	100.4	5.0	100	0	100	74 - 126				
Dibromomethane	102.1	5.0	100	0	102	79 - 123				
Dichlorodifluoromethane	102.9	5.0	100	0	103	32 - 152				
Ethylbenzene	114.9	5.0	100	0	115	79 - 121				
Hexachlorobutadiene	149.1	5.0	100	0	149	66 - 134				S
Isopropylbenzene	115.9	5.0	100	0	116	72 - 131				
m,p-Xylene	233.4	10	200	0	117	80 - 121				
Methylene chloride	136.3	10	100	0	136	74 - 124				S
Naphthalene	91	5.0	100	0	91.0	61 - 128				
n-Butylbenzene	115.3	5.0	100	0	115	75 - 128				
n-Propylbenzene	121.3	5.0	100	0	121	76 - 126				
o-Xylene	111.8	5.0	100	0	112	78 - 122				
sec-Butylbenzene	117.5	5.0	100	0	118	77 - 126				
Styrene	107.1	5.0	100	0	107	78 - 123				
tert-Butylbenzene	114.7	5.0	100	0	115	78 - 124				
Tetrachloroethene	128.7	5.0	100	0	129	74 - 129				
Toluene	117.1	5.0	100	0	117	80 - 121				
trans-1,2-Dichloroethene	115.2	5.0	100	2.07	113	75 - 124				
trans-1,3-Dichloropropene	102.2	5.0	100	0	102	73 - 127				
Trichloroethene	442.2	5.0	100	355.5	86.7	79 - 123				
Trichlorofluoromethane	106.1	5.0	100	0	106	65 - 141				
Vinyl chloride	109.1	5.0	100	0	109	58 - 137				
Surr: 1,2-Dichloroethane-d4	*255.6*	*5.0*	*250*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*253.3*	*5.0*	*250*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*263.1*	*5.0*	*250*	*0*	*105*	*80 - 119*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110430-06MS** Units: **ug/L** Analysis Date: **13-Nov-2022 13:58**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978298** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*271.6*	*5.0*	*250*	*0*	*109*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110430-06MSD** Units: **ug/L** Analysis Date: **13-Nov-2022 14:18**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978299** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	99.76	5.0	100	0	99.8	78 - 124	101.8	1.99	20	
1,1,1-Trichloroethane	118.3	5.0	100	0	118	74 - 131	122	3.06	20	
1,1,2,2-Tetrachloroethane	100.2	5.0	100	0	100	71 - 121	98.04	2.17	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	185.1	5.0	100	0	185	70 - 136	192.7	4.03	20	S
1,1,2-Trichloroethane	102.8	5.0	100	0	103	80 - 119	103.1	0.247	20	
1,1-Dichloroethane	93.24	5.0	100	0	93.2	77 - 125	85.89	8.2	20	
1,1-Dichloroethene	146.4	5.0	100	0	146	71 - 131	154.3	5.27	20	S
1,1-Dichloropropene	127.1	5.0	100	0	127	78 - 125	132.5	4.16	20	S
1,2,3-Trichlorobenzene	103.4	5.0	100	0	103	69 - 129	105.1	1.6	20	
1,2,3-Trichloropropane	91.63	5.0	100	0	91.6	73 - 122	87.69	4.4	20	
1,2,4-Trichlorobenzene	106.4	5.0	100	0	106	69 - 130	107.7	1.28	20	
1,2,4-Trimethylbenzene	106.2	5.0	100	0	106	76 - 124	107.9	1.59	20	
1,2-Dibromo-3-chloropropane	95.32	5.0	100	0	95.3	62 - 128	89.85	5.91	20	
1,2-Dibromoethane	101.1	5.0	100	0	101	77 - 121	100.4	0.661	20	
1,2-Dichlorobenzene	105.4	5.0	100	0	105	80 - 119	106.4	0.964	20	
1,2-Dichloroethane	106.6	5.0	100	0	107	73 - 128	102.7	3.67	20	
1,2-Dichloropropane	109.7	5.0	100	0	110	78 - 122	105.3	4.09	20	
1,3,5-Trimethylbenzene	109.8	5.0	100	0	110	75 - 124	115.4	4.97	20	
1,3-Dichlorobenzene	97.16	5.0	100	0	97.2	80 - 119	101	3.86	20	
1,3-Dichloropropane	102.1	5.0	100	0	102	80 - 119	105.4	3.22	20	
1,4-Dichlorobenzene	108.2	5.0	100	0	108	79 - 118	111.2	2.7	20	
2,2-Dichloropropane	124	5.0	100	0	124	60 - 139	129.1	4	20	
2-Butanone	211.3	10	200	0	106	56 - 143	191	10.1	20	
2-Chlorotoluene	111.2	5.0	100	0	111	79 - 122	115.2	3.52	20	
2-Hexanone	195.9	10	200	0	97.9	57 - 139	199.7	1.94	20	
4-Chlorotoluene	105.5	5.0	100	0	106	78 - 122	109.4	3.62	20	
4-Isopropyltoluene	112	5.0	100	0	112	77 - 127	117.4	4.72	20	
4-Methyl-2-pentanone	185.6	10	200	0	92.8	67 - 130	189.8	2.27	20	
Acetone	260.2	10	200	0	130	39 - 160	243.5	6.6	20	
Benzene	110.6	5.0	100	0	111	79 - 120	112.2	1.47	20	
Bromobenzene	101.6	5.0	100	0	102	80 - 120	103.7	2.09	20	
Bromochloromethane	119.9	5.0	100	0	120	78 - 123	116	3.29	20	
Bromodichloromethane	104.8	5.0	100	0	105	79 - 125	107.2	2.23	20	
Bromoform	96.63	5.0	100	0	96.6	66 - 130	100.8	4.22	20	

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110430-06MSD** Units: **ug/L** Analysis Date: **13-Nov-2022 14:18**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978299** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	89.44	5.0	100	0	89.4	53 - 141	86.95	2.83	20	
Carbon disulfide	269.6	10	200	0	135	64 - 133	296.9	9.66	20	S
Carbon tetrachloride	121.9	5.0	100	0	122	72 - 136	131.2	7.38	20	
Chlorobenzene	99.87	5.0	100	0	99.9	82 - 118	105.5	5.47	20	
Chloroethane	110.9	5.0	100	0	111	60 - 138	118.8	6.81	20	
Chloroform	105.7	5.0	100	0	106	79 - 124	107.9	2.04	20	
Chloromethane	109.4	5.0	100	0	109	50 - 139	104.9	4.26	20	
cis-1,2-Dichloroethene	116.5	5.0	100	0	116	78 - 123	117.6	0.902	20	
cis-1,3-Dichloropropene	109.4	5.0	100	0	109	75 - 124	107.7	1.58	20	
Dibromochloromethane	98.07	5.0	100	0	98.1	74 - 126	100.4	2.38	20	
Dibromomethane	98.64	5.0	100	0	98.6	79 - 123	102.1	3.48	20	
Dichlorodifluoromethane	99.86	5.0	100	0	99.9	32 - 152	102.9	2.95	20	
Ethylbenzene	108.5	5.0	100	0	108	79 - 121	114.9	5.79	20	
Hexachlorobutadiene	146.6	5.0	100	0	147	66 - 134	149.1	1.69	20	S
Isopropylbenzene	109.7	5.0	100	0	110	72 - 131	115.9	5.42	20	
m,p-Xylene	216.8	10	200	0	108	80 - 121	233.4	7.38	20	
Methylene chloride	136.5	10	100	0	136	74 - 124	136.3	0.167	20	S
Naphthalene	92.31	5.0	100	0	92.3	61 - 128	91	1.43	20	
n-Butylbenzene	112.2	5.0	100	0	112	75 - 128	115.3	2.78	20	
n-Propylbenzene	114.8	5.0	100	0	115	76 - 126	121.3	5.52	20	
o-Xylene	107.3	5.0	100	0	107	78 - 122	111.8	4.06	20	
sec-Butylbenzene	113.3	5.0	100	0	113	77 - 126	117.5	3.67	20	
Styrene	102.5	5.0	100	0	102	78 - 123	107.1	4.37	20	
tert-Butylbenzene	109.9	5.0	100	0	110	78 - 124	114.7	4.27	20	
Tetrachloroethene	118.2	5.0	100	0	118	74 - 129	128.7	8.49	20	
Toluene	111	5.0	100	0	111	80 - 121	117.1	5.39	20	
trans-1,2-Dichloroethene	112.3	5.0	100	2.07	110	75 - 124	115.2	2.56	20	
trans-1,3-Dichloropropene	100.5	5.0	100	0	100	73 - 127	102.2	1.75	20	
Trichloroethene	429	5.0	100	355.5	73.4	79 - 123	442.2	3.04	20	S
Trichlorofluoromethane	119.6	5.0	100	0	120	65 - 141	106.1	12	20	
Vinyl chloride	109.6	5.0	100	0	110	58 - 137	109.1	0.373	20	
Surr: 1,2-Dichloroethane-d4	*266.3*	*5.0*	*250*	*0*	*107*	*81 - 118*	*255.6*	*4.1*	*20*	
Surr: 4-Bromofluorobenzene	*249.6*	*5.0*	*250*	*0*	*99.8*	*85 - 114*	*253.3*	*1.45*	*20*	
Surr: Dibromofluoromethane	*263*	*5.0*	*250*	*0*	*105*	*80 - 119*	*263.1*	*0.045*	*20*	

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421680 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110430-06MSD** Units: **ug/L** Analysis Date: **13-Nov-2022 14:18**
Client ID: Run ID: **VOA10_421680** SeqNo: **6978299** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*269.4*	*5.0*	*250*	*0*	*108*	*89 - 112*	*271.6*	*0.823*	*20*	

The following samples were analyzed in this batch:

HS22110553-01	HS22110553-02	HS22110553-03	HS22110553-04
HS22110553-05	HS22110553-06	HS22110553-07	HS22110553-08
HS22110553-09	HS22110553-10	HS22110553-11	HS22110553-12
HS22110553-13	HS22110553-14		

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421783 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221114** Units: **ug/L** Analysis Date: **14-Nov-2022 12:49**
Client ID: Run ID: **VOA10_421783** SeqNo: **6980435** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*57.91*	*1.0*	*50*	*0*	*116*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.11*	*1.0*	*50*	*0*	*98.2*	*85 - 114*				
Surr: Dibromofluoromethane	*59.03*	*1.0*	*50*	*0*	*118*	*80 - 119*				
Surr: Toluene-d8	*53.16*	*1.0*	*50*	*0*	*106*	*89 - 112*				

LCS Sample ID: **VLCSW-221114** Units: **ug/L** Analysis Date: **14-Nov-2022 12:08**
Client ID: Run ID: **VOA10_421783** SeqNo: **6980434** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	24.18	1.0	20	0	121	71 - 131				
Surr: 1,2-Dichloroethane-d4	*56.43*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.62*	*1.0*	*50*	*0*	*97.2*	*85 - 114*				
Surr: Dibromofluoromethane	*55.23*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*54.08*	*1.0*	*50*	*0*	*108*	*89 - 112*				

MS Sample ID: **HS22110553-06MS** Units: **ug/L** Analysis Date: **14-Nov-2022 13:30**
Client ID: **67WW15-221108** Run ID: **VOA10_421783** SeqNo: **6980437** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	843.5	10	200	644.9	99.3	71 - 131				
Surr: 1,2-Dichloroethane-d4	*519.9*	*10*	*500*	*0*	*104*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*497.2*	*10*	*500*	*0*	*99.4*	*85 - 114*				
Surr: Dibromofluoromethane	*532.5*	*10*	*500*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*542.5*	*10*	*500*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110553

QC BATCH REPORT

Batch ID: R421783 (0) **Instrument:** VOA10 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110553-06MSD** Units: **ug/L** Analysis Date: **14-Nov-2022 13:51**
Client ID: **67WW15-221108** Run ID: **VOA10_421783** SeqNo: **6980438** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1-Dichloroethene	840.4	10	200	644.9	97.7	71 - 131	843.5	0.367	20	
Surr: 1,2-Dichloroethane-d4	*509.4*	*10*	*500*	*0*	*102*	*81 - 118*	*519.9*	*2.05*	*20*	
Surr: 4-Bromofluorobenzene	*488.8*	*10*	*500*	*0*	*97.8*	*85 - 114*	*497.2*	*1.7*	*20*	
Surr: Dibromofluoromethane	*535.2*	*10*	*500*	*0*	*107*	*80 - 119*	*532.5*	*0.51*	*20*	
Surr: Toluene-d8	*552*	*10*	*500*	*0*	*110*	*89 - 112*	*542.5*	*1.74*	*20*	

The following samples were analyzed in this batch: HS22110553-06

ALS Houston, US Date: 15-Nov-22

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: **HS22110553**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2022	31-Dec-2022
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 15-Nov-22

Sample Receipt Checklist

Work Order ID: HS22110553 **Date/Time Received:** 09-Nov-2022 09:15

Client Name: CBI-Houston **Received by:** Nelson D. Dusara

Completed By: /S/ Ragen Giga (eSignature) 09-Nov-2022 16:02 (Date/Time) **Reviewed by:** /S/ Dane J. Wacasey (eSignature) 15-Nov-2022 11:05 (Date/Time)

Matrices: GW Carrier name: FedEx Priority Overnight

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:Client
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.1uc/1.6c		IR 31
Cooler(s)/Kit(s):	49303		
Date/Time sample(s) sent to storage:	11/09/2022 16:00		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 575-2190 ATTN: Dane Wacasey

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 67 November 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22110553
Aptim Environmental & Infrastucture, Inc.
LHAAP 67 November 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Remarks (Preservatives, etc.)	Lab I.D.#
67WW14-221107	W6	11/7/22 0855		3	X						
67WW05-221107	W6	11/7/22 0935		3	X						
67WW18-221107	W6	11/7/22 1025		3	X						
67WW17-221107	W6	11/7/22 1110		3	X						
67WW02-221107	W6	11/7/22 1210		3	X						
67WW15-221108	W6	11/8/22 0700		3	X						
67WW09-221108	W6	11/8/22 0745		3	X						
67WW11-221108	W6	11/8/22 0830		3	X						

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	11/8/22	1300	[illegible]	11/09/22	0715						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

49303 IR31
2.1

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 575-2190 ATTN: Dane Wacasey

Project: APTIM LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 67 November 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22110553

Aptim Environmental & Infrastucture, Inc.

LHAAP 67 November 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Remarks (Preservatives, etc.)	Lab I.D.#
67WW16I-221108	W6	11/8/22 0920		3	X						
67WW16I-221108-FD	W6	11/8/22 0920		3	X						
67WW01-221108	W6	11/8/22 1005		3	X						
67WW12-221108	W6	11/8/22 1050		3	X						
67WW07-221108	W6	11/8/22 1135		3	X						
TRIP BLANK-221108	W	11/8/22		2	X						

Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	11/8/22	1300	Nelson	11/09/22	9:15						

For Lab Use Only

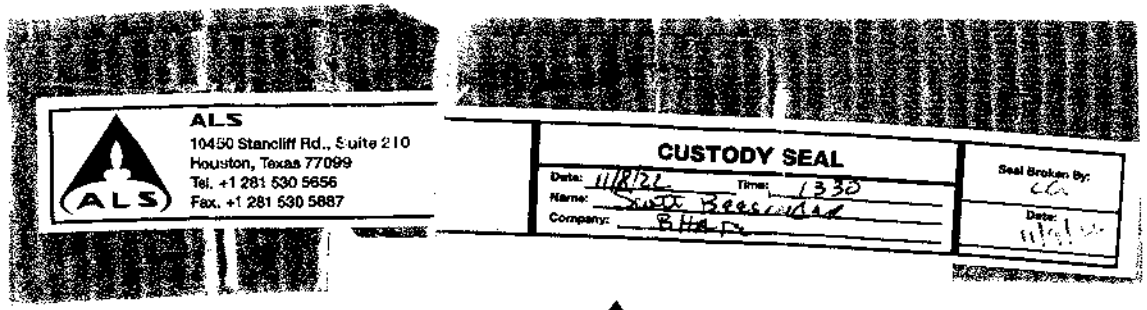
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
	11								

Remarks:

49303 IR31

2-1

(Word) S:\Forms\Chain of Custody - BiWeekly



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SEAL
Date: 11/8/22 Time: 1330
Name: Scott Beesinger
Company: BHE

Seal Broken By:
Date:

ALS

ORIGIN ID:SGRA (903) 930-6183
SCOTT BEESINGER
APTIM ENVIROMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 26OCT22
ACTWGT: 1.00 LB MAN
CAD: 0221247/CAFE3618
DIMS: 19x16x13 IN

TO SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5666
REF: LHAAP 67-BO 00651-DW
RMA:

FedEx Express

FedEx TRK# 0221 5789 2000 0100

WED - 09 NOV AA
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

HS22110553-MSVOA-SW8260

ALS WO# HS22110553

right solutions.
right partner.

Form 1

Organic Analysis Data Sheet

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-01	Collected	Received	Matrix	Basis
67WW14-221107	11/07/22 08:55	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1-Dichloroethene	ug/L	1.2		0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-01	Collected	Received	Matrix	Basis
67WW14-221107	11/07/22 08:55	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 16:42	VOA10_421680	V111317
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:42	VOA10_421680	V111317

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-02	Collected	Received	Matrix	Basis
67WW05-221107	11/07/22 09:35	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-02	Collected	Received	Matrix	Basis
67WW05-221107	11/07/22 09:35	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 17:02	VOA10_421680	V111318
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:02	VOA10_421680	V111318

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-03				Collected	Received	Matrix	Basis
67WW18-221107				11/07/22 10:25	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-03				Collected	Received	Matrix	Basis
67WW18-221107				11/07/22 10:25	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 17:23	VOA10_421680	V111319
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:23	VOA10_421680	V111319

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-04				Collected	Received	Matrix	Basis
67WW17-221107				11/07/22 11:10	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-04	Collected	Received	Matrix	Basis
67WW17-221107	11/07/22 11:10	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 17:43	VOA10_421680	V111320
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 17:43	VOA10_421680	V111320

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-05				Collected		Received		Matrix	Basis
67WW02-221107				11/07/22 12:10		11/09/22 09:15		GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1-Dichloroethane	ug/L	4.5		0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1-Dichloroethene	ug/L	100		0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-05	Collected	Received	Matrix	Basis
67WW02-221107	11/07/22 12:10	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 20:07	VOA10_421680	V111327
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:07	VOA10_421680	V111327

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-06	Collected	Received	Matrix	Basis
67WW15-221108	11/08/22 07:00	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,1,2-Trichloroethane	ug/L	3.2		0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,1-Dichloroethane	ug/L	9.9		0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,1-Dichloroethene	ug/L	640		2.0	10	10	10	11/14/22 13:10	VOA10_421783	V111408
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2-Dichloroethane	ug/L	24		0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-06	Collected	Received	Matrix	Basis
67WW15-221108	11/08/22 07:00	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
cis-1,2-Dichloroethene	ug/L	1.0		0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
Methylene chloride	ug/L	3.3		0.40	2.0	2.0	1	11/13/22 20:47	VOA10_421680	V111329
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Trichloroethene	ug/L	1.4		0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:47	VOA10_421680	V111329

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-07				Collected	Received	Matrix	Basis
67WW09-221108				11/08/22 07:45	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-07				Collected	Received	Matrix	Basis
67WW09-221108				11/08/22 07:45	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 18:04	VOA10_421680	V111321
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:04	VOA10_421680	V111321

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-08	Collected	Received	Matrix	Basis
67WW11-221108	11/08/22 08:30	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-08				Collected	Received	Matrix	Basis
67WW11-221108				11/08/22 08:30	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 18:24	VOA10_421680	V111322
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:24	VOA10_421680	V111322

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110553**

Volatiles by by EPA 8260

HS22110553-09	Collected	Received	Matrix	Basis
67WW16I-221108	11/08/22 09:20	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-09	Collected	Received	Matrix	Basis
67WW16I-221108	11/08/22 09:20	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 18:45	VOA10_421680	V111323
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 18:45	VOA10_421680	V111323

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110553**

Volatiles by by EPA 8260

HS22110553-10	Collected	Received	Matrix	Basis
67WW16I-221108-FD	11/08/22 09:20	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-10	Collected	Received	Matrix	Basis
67WW16I-221108-FD	11/08/22 09:20	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 19:05	VOA10_421680	V111324
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:05	VOA10_421680	V111324

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-11				Collected	Received	Matrix	Basis
67WW01-221108				11/08/22 10:05	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1-Dichloroethane	ug/L	1.3		0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1-Dichloroethene	ug/L	36		0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2-Dichloroethane	ug/L	3.6		0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-11	Collected	Received	Matrix	Basis
67WW01-221108	11/08/22 10:05	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 19:26	VOA10_421680	V111325
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:26	VOA10_421680	V111325

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110553**

Volatiles by by EPA 8260

HS22110553-12	Collected	Received	Matrix	Basis
67WW12-221108	11/08/22 10:50	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1-Dichloroethene	ug/L	40		0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-12	Collected	Received	Matrix	Basis
67WW12-221108	11/08/22 10:50	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 20:27	VOA10_421680	V111328
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 20:27	VOA10_421680	V111328

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110553**

Volatiles by by EPA 8260

HS22110553-13	Collected	Received	Matrix	Basis
67WW07-221108	11/08/22 11:35	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-13	Collected	Received	Matrix	Basis
67WW07-221108	11/08/22 11:35	11/09/22 09:15	GW	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 19:46	VOA10_421680	V111326
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 19:46	VOA10_421680	V111326

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-14	Collected	Received	Matrix	Basis
Trip Blank-221108	11/08/22 00:00	11/09/22 09:15	Water	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

HS22110553-14	Collected	Received	Matrix	Basis
Trip Blank-221108	11/08/22 00:00	11/09/22 09:15	Water	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 16:01	VOA10_421680	V111315
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 16:01	VOA10_421680	V111315

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

VBLKW-221113	Collected	Received	Matrix	Basis
VBLKW-221113	NA	NA	Aqueous	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

VBLKW-221113	Collected	Received	Matrix	Basis
VBLKW-221113	NA	NA	Aqueous	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/13/22 13:17	VOA10_421680	V111307
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/13/22 13:17	VOA10_421680	V111307

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

VBLKW-221114	Collected	Received	Matrix	Basis
VBLKW-221114	NA	NA	Aqueous	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/14/22 12:49	VOA10_421783	V111407

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Form 2

System Monitoring Compound Recovery

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

Volatiles by by EPA 8260

VSTD050	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	50.58	50	101	80-120	
4-Bromofluorobenzene	49.6	50	99.2	80-120	
Dibromofluoromethane	53.27	50	107	80-120	
Toluene-d8	55.04	50	110	80-120	

CCB	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	55.11	50	110	80-120	
4-Bromofluorobenzene	50.43	50	101	80-120	
Dibromofluoromethane	58.76	50	118	80-120	
Toluene-d8	52.81	50	106	80-120	

VLCSW-221113	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	53.46	50	107	81-118	
4-Bromofluorobenzene	48.45	50	96.9	85-114	
Dibromofluoromethane	54.85	50	110	80-119	
Toluene-d8	52.17	50	104	89-112	

VBLKW-221113	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	54.85	50	110	81-118	
4-Bromofluorobenzene	49	50	98.0	85-114	
Dibromofluoromethane	56.53	50	113	80-119	
Toluene-d8	52.11	50	104	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

Volatiles by by EPA 8260

HS22110430-06MS	Analyzed 11/13/22		Conc Units µg/L		DF 5
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	255.6	250	102	81-118	
4-Bromofluorobenzene	253.3	250	101	85-114	
Dibromofluoromethane	263.1	250	105	80-119	
Toluene-d8	271.6	250	109	89-112	

HS22110430-06MSD	Analyzed 11/13/22		Conc Units µg/L		DF 5
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	266.3	250	107	81-118	
4-Bromofluorobenzene	249.6	250	99.8	85-114	
Dibromofluoromethane	263	250	105	80-119	
Toluene-d8	269.4	250	108	89-112	

HS22110553-14	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57	50	113	81-118	
4-Bromofluorobenzene	49	50	98.8	85-114	
Dibromofluoromethane	59	50	118	80-119	
Toluene-d8	51	50	103	89-112	

HS22110553-01	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57	50	115	81-118	
4-Bromofluorobenzene	50	50	99.8	85-114	
Dibromofluoromethane	59	50	118	80-119	
Toluene-d8	51	50	102	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

Volatiles by by EPA 8260

HS22110553-02	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57	50	114	81-118	
4-Bromofluorobenzene	49	50	98.7	85-114	
Dibromofluoromethane	60	50	119	80-119	
Toluene-d8	51	50	102	89-112	

HS22110553-03	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	56	50	111	81-118	
4-Bromofluorobenzene	50	50	99.2	85-114	
Dibromofluoromethane	58	50	117	80-119	
Toluene-d8	52	50	103	89-112	

HS22110553-04	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57	50	113	81-118	
4-Bromofluorobenzene	50	50	99.7	85-114	
Dibromofluoromethane	59	50	119	80-119	
Toluene-d8	51	50	101	89-112	

HS22110553-07	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	58	50	115	81-118	
4-Bromofluorobenzene	49	50	97.6	85-114	
Dibromofluoromethane	56	50	113	80-119	
Toluene-d8	51	50	102	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

Volatiles by by EPA 8260

HS22110553-08	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	55	50	109	81-118	
4-Bromofluorobenzene	50	50	100	85-114	
Dibromofluoromethane	58	50	115	80-119	
Toluene-d8	52	50	104	89-112	

HS22110553-09	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	55	50	111	81-118	
4-Bromofluorobenzene	49	50	98.1	85-114	
Dibromofluoromethane	59	50	119	80-119	
Toluene-d8	52	50	103	89-112	

HS22110553-10	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	56	50	113	81-118	
4-Bromofluorobenzene	50	50	100	85-114	
Dibromofluoromethane	61	50	122	80-119	
Toluene-d8	52	50	104	89-112	

HS22110553-11	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	56	50	113	81-118	
4-Bromofluorobenzene	50	50	99.1	85-114	
Dibromofluoromethane	59	50	119	80-119	
Toluene-d8	51	50	102	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

Volatiles by by EPA 8260

HS22110553-13	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	56	50	112	81-118	
4-Bromofluorobenzene	49	50	97.5	85-114	
Dibromofluoromethane	59	50	119	80-119	
Toluene-d8	52	50	103	89-112	

HS22110553-05	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	56	50	112	81-118	
4-Bromofluorobenzene	50	50	99.1	85-114	
Dibromofluoromethane	57	50	114	80-119	
Toluene-d8	52	50	103	89-112	

HS22110553-12	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57	50	115	81-118	
4-Bromofluorobenzene	49	50	98.2	85-114	
Dibromofluoromethane	59	50	119	80-119	
Toluene-d8	51	50	102	89-112	

HS22110553-06	Analyzed 11/13/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57	50	114	81-118	
4-Bromofluorobenzene	49	50	99.0	85-114	
Dibromofluoromethane	56	50	112	80-119	
Toluene-d8	51	50	103	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421783

Volatiles by by EPA 8260

VSTD050	Analyzed 11/14/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	48.65	50	97.3	80-120	
4-Bromofluorobenzene	47.39	50	94.8	80-120	
Dibromofluoromethane	49.88	50	99.8	80-120	
Toluene-d8	55.18	50	110	80-120	

CCB	Analyzed 11/14/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	67.21	50	134	80-120	
4-Bromofluorobenzene	50.55	50	101	80-120	
Dibromofluoromethane	56.03	50	112	80-120	
Toluene-d8	53.36	50	107	80-120	

VLCSW-221114	Analyzed 11/14/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	56.43	50	113	81-118	
4-Bromofluorobenzene	48.62	50	97.2	85-114	
Dibromofluoromethane	55.23	50	110	80-119	
Toluene-d8	54.08	50	108	89-112	

VBLKW-221114	Analyzed 11/14/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	57.91	50	116	81-118	
4-Bromofluorobenzene	49.11	50	98.2	85-114	
Dibromofluoromethane	59.03	50	118	80-119	
Toluene-d8	53.16	50	106	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421783

Volatiles by by EPA 8260

HS22110553-06	Analyzed 11/14/22		Conc Units µg/L		DF 10
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	560	500	113	81-118	
4-Bromofluorobenzene	500	500	99.7	85-114	
Dibromofluoromethane	590	500	118	80-119	
Toluene-d8	510	500	102	89-112	

HS22110553-06MS	Analyzed 11/14/22		Conc Units µg/L		DF 10
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	519.9	500	104	81-118	
4-Bromofluorobenzene	497.2	500	99.4	85-114	
Dibromofluoromethane	532.5	500	106	80-119	
Toluene-d8	542.5	500	108	89-112	

HS22110553-06MSD	Analyzed 11/14/22		Conc Units µg/L		DF 10
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	509.4	500	102	81-118	
4-Bromofluorobenzene	488.8	500	97.8	85-114	
Dibromofluoromethane	535.2	500	107	80-119	
Toluene-d8	552	500	110	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

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Form 3A

Matrix Spike/Spike Duplicate Recovery

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110553**

		HS22110430-06		HS22110430-06MS				HS22110430-06MSD						
Sample Matrix	Aqueous	**Run Date**	11/13/22	11/13/22				11/13/22						
Units	µg/L	**Run Time**	13:37	13:58				14:18						
		Data File	V111308.D	V111309.D				V111310.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
1,1,1,2-Tetrachloroethane	78-124	5	0	101.8	100.0	102		99.76	100.0	100		20	2.00	
1,1,1-Trichloroethane	74-131	5	0	122.0	100.0	122		118.3	100.0	118		20	3.10	
1,1,2,2-Tetrachloroethane	71-121	5	0	98.04	100.0	98		100.2	100.0	100		20	2.20	
1,1,2-Trichlor-1,2,2-	70-136	5	0	192.7	100.0	193	*	185.1	100.0	185	*	20	4.00	
1,1,2-Trichloroethane	80-119	5	0	103.1	100.0	103		102.8	100.0	103		20	0.200	
1,1-Dichloroethane	77-125	5	0	85.89	100.0	86		93.24	100.0	93		20	8.20	
1,1-Dichloroethene	71-131	5	0	154.3	100.0	154	*	146.4	100.0	146	*	20	5.30	
1,1-Dichloropropene	78-125	5	0	132.5	100.0	133	*	127.1	100.0	127	*	20	4.20	
1,2,3-Trichlorobenzene	69-129	5	0	105.1	100.0	105		103.4	100.0	103		20	1.60	
1,2,3-Trichloropropane	73-122	5	0	87.69	100.0	88		91.63	100.0	92		20	4.40	
1,2,4-Trichlorobenzene	69-130	5	0	107.7	100.0	108		106.4	100.0	106		20	1.30	
1,2,4-Trimethylbenzene	76-124	5	0	107.9	100.0	108		106.2	100.0	106		20	1.60	
1,2-Dibromo-3-	62-128	5	0	89.85	100.0	90		95.32	100.0	95		20	5.90	
1,2-Dibromoethane	77-121	5	0	100.4	100.0	100		101.1	100.0	101		20	0.700	
1,2-Dichlorobenzene	80-119	5	0	106.4	100.0	106		105.4	100.0	105		20	1.00	
1,2-Dichloroethane	73-128	5	0	102.7	100.0	103		106.6	100.0	107		20	3.70	
1,2-Dichloropropane	78-122	5	0	105.3	100.0	105		109.7	100.0	110		20	4.10	
1,3,5-Trimethylbenzene	75-124	5	0	115.4	100.0	115		109.8	100.0	110		20	5.00	
1,3-Dichlorobenzene	80-119	5	0	101.0	100.0	101		97.16	100.0	97		20	3.90	
1,3-Dichloropropane	80-119	5	0	105.4	100.0	105		102.1	100.0	102		20	3.20	
1,4-Dichlorobenzene	79-118	5	0	111.2	100.0	111		108.2	100.0	108		20	2.70	
2,2-Dichloropropane	60-139	5	0	129.1	100.0	129		124	100.0	124		20	4.00	
2-Butanone	56-143	5	0	191.0	200.0	96		211.3	200.0	106		20	10.1	
2-Chlorotoluene	79-122	5	0	115.2	100.0	115		111.2	100.0	111		20	3.50	
2-Hexanone	57-139	5	0	199.7	200.0	100		195.9	200.0	98		20	1.90	
4-Chlorotoluene	78-122	5	0	109.4	100.0	109		105.5	100.0	106		20	3.60	
4-Isopropyltoluene	77-127	5	0	117.4	100.0	117		112	100.0	112		20	4.70	
4-Methyl-2-pentanone	67-130	5	0	189.8	200.0	95		185.6	200.0	93		20	2.30	
Acetone	39-160	5	0	243.5	200.0	122		260.2	200.0	130		20	6.60	
Benzene	79-120	5	0	112.2	100.0	112		110.6	100.0	111		20	1.50	
Bromobenzene	80-120	5	0	103.7	100.0	104		101.6	100.0	102		20	2.10	
Bromochloromethane	78-123	5	0	116.0	100.0	116		119.9	100.0	120		20	3.30	
Bromodichloromethane	79-125	5	0	107.2	100.0	107		104.8	100.0	105		20	2.20	
Bromoform	66-130	5	0	100.8	100.0	101		96.63	100.0	97		20	4.20	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110553**

		HS22110430-06		HS22110430-06MS				HS22110430-06MSD						
Sample Matrix	Aqueous	**Run Date**	11/13/22	11/13/22				11/13/22						
Units	µg/L	**Run Time**	13:37	13:58				14:18						
		Data File	V111308.D	V111309.D				V111310.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
Bromomethane	53-141	5	0	86.95	100.0	87		89.44	100.0	89		20	2.80	
Carbon disulfide	64-133	5	0	296.9	200.0	148	*	269.6	200.0	135	*	20	9.70	
Carbon tetrachloride	72-136	5	0	131.2	100.0	131		121.9	100.0	122		20	7.40	
Chlorobenzene	82-118	5	0	105.5	100.0	105		99.87	100.0	100		20	5.50	
Chloroethane	60-138	5	0	118.8	100.0	119		110.9	100.0	111		20	6.80	
Chloroform	79-124	5	0	107.9	100.0	108		105.7	100.0	106		20	2.00	
Chloromethane	50-139	5	0	104.9	100.0	105		109.4	100.0	109		20	4.30	
cis-1,2-Dichloroethene	78-123	5	0	117.6	100.0	118		116.5	100.0	116		20	0.900	
cis-1,3-Dichloropropene	75-124	5	0	107.7	100.0	108		109.4	100.0	109		20	1.60	
Dibromochloromethane	74-126	5	0	100.4	100.0	100		98.07	100.0	98		20	2.40	
Dibromomethane	79-123	5	0	102.1	100.0	102		98.64	100.0	99		20	3.50	
Dichlorodifluoromethane	32-152	5	0	102.9	100.0	103		99.86	100.0	100		20	3.00	
Ethylbenzene	79-121	5	0	114.9	100.0	115		108.5	100.0	108		20	5.80	
Hexachlorobutadiene	66-134	5	0	149.1	100.0	149	*	146.6	100.0	147	*	20	1.70	
Isopropylbenzene	72-131	5	0	115.9	100.0	116		109.7	100.0	110		20	5.40	
m,p-Xylene	80-121	5	0	233.4	200.0	117		216.8	200.0	108		20	7.40	
Methylene chloride	74-124	5	0	136.3	100.0	136	*	136.5	100.0	136	*	20	0.200	
n-Butylbenzene	75-128	5	0	115.3	100.0	115		112.2	100.0	112		20	2.80	
n-Propylbenzene	76-126	5	0	121.3	100.0	121		114.8	100.0	115		20	5.50	
Naphthalene	61-128	5	0	91.00	100.0	91		92.31	100.0	92		20	1.40	
o-Xylene	78-122	5	0	111.8	100.0	112		107.3	100.0	107		20	4.10	
sec-Butylbenzene	77-126	5	0	117.5	100.0	118		113.3	100.0	113		20	3.70	
Styrene	78-123	5	0	107.1	100.0	107		102.5	100.0	102		20	4.40	
tert-Butylbenzene	78-124	5	0	114.7	100.0	115		109.9	100.0	110		20	4.30	
Tetrachloroethene	74-129	5	0	128.7	100.0	129		118.2	100.0	118		20	8.50	
Toluene	80-121	5	0	117.1	100.0	117		111	100.0	111		20	5.40	
trans-1,2-Dichloroethene	75-124	5	2.070	115.2	100.0	113		112.3	100.0	110		20	2.60	
trans-1,3-Dichloropropene	73-127	5	0	102.2	100.0	102		100.5	100.0	100		20	1.70	
Trichloroethene	79-123	5	355.5	442.2	100.0	87		429	100.0	73	*	20	3.00	
Trichlorofluoromethane	65-141	5	0	106.1	100.0	106		119.6	100.0	120		20	12.0	
Vinyl chloride	58-137	5	0	109.1	100.0	109		109.6	100.0	110		20	0.400	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

67WW15-221108		HS22110553-06		HS22110553-06MS				HS22110553-06MSD						
Sample Matrix Aqueous		**Run Date**	11/14/22	11/14/22				11/14/22						
Units µg/L		**Run Time**	13:10	13:30				13:51						
		Data File	V111408.D	V111409.D				V111410.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
1,1-Dichloroethene	71-131	10	644.9	843.5	200.0	99		840.4	200.0	98		20	0.400	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

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Form 3B

Laboratory Control Sample Recovery

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 3B - Laboratory Control Sample Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

VOA10_421680		QC ID	VLCSW-221113			
QC Matrix Aqueous	Units	Run Date	11/13/22			
	ug/L	Run Time	12:36			
Analyte	%R Limits	Spike Added	LCS Result	%R	Q	
1,1,1,2-Tetrachloroethane	78-124	20	18.57	93		
1,1,1-Trichloroethane	74-131	20	20	100		
1,1,2,2-Tetrachloroethane	71-121	20	19.76	99		
1,1,2-Trichlor-1,2,2-trifluoroethane	70-136	20	17.16	86		
1,1,2-Trichloroethane	80-119	20	19.49	97		
1,1-Dichloroethane	77-125	20	24.53	123		
1,1-Dichloroethene	71-131	20	16.37	82		
1,1-Dichloropropene	78-125	20	20.52	103		
1,2,3-Trichlorobenzene	69-129	20	19.76	99		
1,2,3-Trichloropropane	73-122	20	16.54	83		
1,2,4-Trichlorobenzene	69-130	20	19.86	99		
1,2,4-Trimethylbenzene	76-124	20	18.25	91		
1,2-Dibromo-3-chloropropane	62-128	20	18.06	90		
1,2-Dibromoethane	77-121	20	18.99	95		
1,2-Dichlorobenzene	80-119	20	19.97	100		
1,2-Dichloroethane	73-128	20	20.31	102		
1,2-Dichloroethane-d4	81-118	50	53.46	107		
1,2-Dichloropropane	78-122	20	20.37	102		
1,3,5-Trimethylbenzene	75-124	20	18.25	91		
1,3-Dichlorobenzene	80-119	20	17.66	88		
1,3-Dichloropropane	80-119	20	19.94	100		
1,4-Dichlorobenzene	79-118	20	20.19	101		
2,2-Dichloropropane	60-139	20	21.85	109		
2-Butanone	56-143	40	41.04	103		
2-Chlorotoluene	79-122	20	19.98	100		
2-Hexanone	57-139	40	40.34	101		
4-Bromofluorobenzene	85-114	50	48.45	97		
4-Chlorotoluene	78-122	20	18.77	94		
4-Isopropyltoluene	77-127	20	17.4	87		
4-Methyl-2-pentanone	67-130	40	37.85	95		
Acetone	39-160	40	28.42	71		
Benzene	79-120	20	20	100		
Bromobenzene	80-120	20	19.48	97		
Bromochloromethane	78-123	20	23.01	115		
Bromodichloromethane	79-125	20	19.67	98		
Bromoform	66-130	20	19.64	98		

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits

Form 3B - Laboratory Control Sample Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

VOA10_421680		QC ID	VLCSW-221113			
QC Matrix Aqueous	Units	Run Date	11/13/22			
	ug/L	Run Time	12:36			
Analyte	%R Limits	Spike Added	LCS Result	%R	Q	
Bromomethane	53-141	20	17.52	88		
Carbon disulfide	64-133	40	32.48	81		
Carbon tetrachloride	72-136	20	19.36	97		
Chlorobenzene	82-118	20	17.91	90		
Chloroethane	60-138	20	19.44	97		
Chloroform	79-124	20	20.27	101		
Chloromethane	50-139	20	20.9	104		
cis-1,2-Dichloroethene	78-123	20	21.45	107		
cis-1,3-Dichloropropene	75-124	20	20.4	102		
Dibromochloromethane	74-126	20	18.83	94		
Dibromofluoromethane	80-119	50	54.85	110		
Dibromomethane	79-123	20	19.92	100		
Dichlorodifluoromethane	32-152	20	19.6	98		
Ethylbenzene	79-121	20	18.12	91		
Hexachlorobutadiene	66-134	20	23.48	117		
Isopropylbenzene	72-131	20	17.14	86		
m,p-Xylene	80-121	40	36.9	92		
Methylene chloride	74-124	20	16.36	82		
Naphthalene	61-128	20	18.5	92		
n-Butylbenzene	75-128	20	17.29	86		
n-Propylbenzene	76-126	20	18.47	92		
o-Xylene	78-122	20	18.8	94		
sec-Butylbenzene	77-126	20	16.97	85		
Styrene	78-123	20	17.97	90		
tert-Butylbenzene	78-124	20	16.99	85		
Tetrachloroethene	74-129	20	18.18	91		
Toluene	80-121	20	19.56	98		
Toluene-d8	89-112	50	52.17	104		
trans-1,2-Dichloroethene	75-124	20	20.88	104		
trans-1,3-Dichloropropene	73-127	20	19.72	99		
Trichloroethene	79-123	20	19.74	99		
Trichlorofluoromethane	65-141	20	18.67	93		
Vinyl chloride	58-137	20	18.43	92		

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits

Form 3B - Laboratory Control Sample Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

VOA10_421783		QC ID	VLCSW-221114			
QC Matrix Aqueous	Units	Run Date	11/14/22			
	ug/L	Run Time	12:08			
Analyte	%R Limits	Spike Added	LCS Result	%R	Q	
1,1-Dichloroethene	71-131	20	24.18	121		
1,2-Dichloroethane-d4	81-118	50	56.43	113		
4-Bromofluorobenzene	85-114	50	48.62	97		
Dibromofluoromethane	80-119	50	55.23	110		
Toluene-d8	89-112	50	54.08	108		

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits

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Form 4

Method Blank Summary

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 4 - Method Blank Summary

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

Client Sample ID	Type	Lab Sample ID	File ID	Date Analyzed	Run ID
METHOD BLANK	MBLK	VBLKW-221113	V111307.D	11/13/22 13:17	VOA10_421680
VLCSW-221113	LCS	VLCSW-221113	V111305.D	11/13/22 12:36	VOA10_421680
BatchQC	MS	HS22110430-06MS	V111309.D	11/13/22 13:58	VOA10_421680
BatchQC	MSD	HS22110430-06MSD	V111310.D	11/13/22 14:18	VOA10_421680
Trip Blank-221108	SAMP	HS22110553-14	V111315.D	11/13/22 16:01	VOA10_421680
67WW14-221107	SAMP	HS22110553-01	V111317.D	11/13/22 16:42	VOA10_421680
67WW05-221107	SAMP	HS22110553-02	V111318.D	11/13/22 17:02	VOA10_421680
67WW18-221107	SAMP	HS22110553-03	V111319.D	11/13/22 17:23	VOA10_421680
67WW17-221107	SAMP	HS22110553-04	V111320.D	11/13/22 17:43	VOA10_421680
67WW09-221108	SAMP	HS22110553-07	V111321.D	11/13/22 18:04	VOA10_421680
67WW11-221108	SAMP	HS22110553-08	V111322.D	11/13/22 18:24	VOA10_421680
67WW16I-221108	SAMP	HS22110553-09	V111323.D	11/13/22 18:45	VOA10_421680
67WW16I-221108-FD	SAMP	HS22110553-10	V111324.D	11/13/22 19:05	VOA10_421680
67WW01-221108	SAMP	HS22110553-11	V111325.D	11/13/22 19:26	VOA10_421680
67WW07-221108	SAMP	HS22110553-13	V111326.D	11/13/22 19:46	VOA10_421680
67WW02-221107	SAMP	HS22110553-05	V111327.D	11/13/22 20:07	VOA10_421680
67WW12-221108	SAMP	HS22110553-12	V111328.D	11/13/22 20:27	VOA10_421680
67WW15-221108	SAMP	HS22110553-06	V111329.D	11/13/22 20:47	VOA10_421680

Form 4 - Method Blank Summary

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

Client Sample ID	Type	Lab Sample ID	File ID	Date Analyzed	Run ID
METHOD BLANK	MBLK	VBLKW-221114	V111407.D	11/14/22 12:49	VOA10_421783
VLCSW-221114	LCS	VLCSW-221114	V111405.D	11/14/22 12:08	VOA10_421783
67WW15-221108	SAMP	HS22110553-06	V111408.D	11/14/22 13:10	VOA10_421783
67WW15-221108	MS	HS22110553-06MS	V111409.D	11/14/22 13:30	VOA10_421783
67WW15-221108	MSD	HS22110553-06MSD	V111410.D	11/14/22 13:51	VOA10_421783

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Form 5

Instrument Performance Check

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 5 - Instrument Performance Check

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421606

Tune File X111001.D 11/10/22 12:54

m / e	Ion Abundance Criterion	%RA
50	15.0 - 40.0% of mass 95	20.6 (20.6)
75	30.0 - 60.0% of mass 95	47 (47)
95	Base peak, 100% RA	100 (100)
96	5.0 - 9.0% of mass 95	6.7 (6.73)
173	Less than 2.0% of mass 174	1.4 (1.6) 1
174	50.0 - 120.0% of mass 95	89 (89)
175	4.0 - 9.0% of mass 174	7.2 (8.06) 1
176	93.0 - 101.0% of mass 174	85.2 (95.7) 1
177	5.0 - 9.0% of mass 176	6.6 (7.74) 2

Value is % of mass 1) 174 2) 176 RA - Relative Abundance

This check applies to the following analyses

	Type	Date Analyzed	Lab File ID	Sample ID
1	ICAL1	11/10/22 13:14	X111002	VSTD000.25
2	ICAL2	11/10/22 13:34	X111003	VSTD000.5
3	ICAL3	11/10/22 14:15	X111004	VSTD001
4	ICAL4	11/10/22 14:35	X111005	VSTD002
5	ICAL5	11/10/22 14:56	X111006	VSTD005
6	ICAL6	11/10/22 15:16	X111007	VSTD020
7	ICAL7	11/10/22 15:37	X111008	VSTD050
8	ICAL8	11/10/22 15:57	X111009	VSTD100
9	ICAL9	11/10/22 16:17	X111010	VSTD150
10	ICAL	11/10/22 16:38	X111011	VSTD200
11	ICV	11/10/22 17:39	X111014	VSTD050

Form 5 - Instrument Performance Check

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

Tune File V111301.D 11/13/22 11:15

m / e	Ion Abundance Criterion	%RA
50	15.0 - 40.0% of mass 95	22.6 (22.6)
75	30.0 - 60.0% of mass 95	50 (50)
95	Base peak, 100% RA	100 (100)
96	5.0 - 9.0% of mass 95	6.8 (6.78)
173	Less than 2.0% of mass 174	0 (0) 1
174	50.0 - 120.0% of mass 95	94.8 (94.8)
175	4.0 - 9.0% of mass 174	8.3 (8.75) 1
176	93.0 - 101.0% of mass 174	92.7 (97.7) 1
177	5.0 - 9.0% of mass 176	5.9 (6.39) 2

Value is % of mass 1) 174 2) 176 RA - Relative Abundance

This check applies to the following analyses

	Type	Date Analyzed	Lab File ID	Sample ID
1	CCV	11/13/22 11:55	V111303	VSTD050
2	CCB	11/13/22 12:16	V111304	CCB
3	LCS	11/13/22 12:36	V111305	VLCSW-221113
4	MBLK	11/13/22 13:17	V111307	VBLKW-221113
5	MS	11/13/22 13:58	V111309	ZZZZZZMS
6	MSD	11/13/22 14:18	V111310	ZZZZZZMSD
7	SAMP	11/13/22 16:01	V111315	Trip Blank-221108
8	SAMP	11/13/22 16:42	V111317	67WW14-221107
9	SAMP	11/13/22 17:02	V111318	67WW05-221107
10	SAMP	11/13/22 17:23	V111319	67WW18-221107
11	SAMP	11/13/22 17:43	V111320	67WW17-221107
12	SAMP	11/13/22 18:04	V111321	67WW09-221108
13	SAMP	11/13/22 18:24	V111322	67WW11-221108
14	SAMP	11/13/22 18:45	V111323	67WW16I-221108
15	SAMP	11/13/22 19:05	V111324	67WW16I-221108-FD
16	SAMP	11/13/22 19:26	V111325	67WW01-221108
17	SAMP	11/13/22 19:46	V111326	67WW07-221108
18	SAMP	11/13/22 20:07	V111327	67WW02-221107
19	SAMP	11/13/22 20:27	V111328	67WW12-221108
20	SAMP	11/13/22 20:47	V111329	67WW15-221108
21	CCV_EN	11/13/22 21:08	V111330	VSTD050-END

Form 5 - Instrument Performance Check

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421783

Tune File V111401.D 11/14/22 10:39

m / e	Ion Abundance Criterion	%RA
50	15.0 - 40.0% of mass 95	21.6 (21.6)
75	30.0 - 60.0% of mass 95	47.9 (47.9)
95	Base peak, 100% RA	100 (100)
96	5.0 - 9.0% of mass 95	7.7 (7.74)
173	Less than 2.0% of mass 174	0 (0) 1
174	50.0 - 120.0% of mass 95	92.7 (92.7)
175	4.0 - 9.0% of mass 174	7.6 (8.16) 1
176	93.0 - 101.0% of mass 174	89.1 (96.2) 1
177	5.0 - 9.0% of mass 176	6.3 (7.05) 2

Value is % of mass 1) 174 2) 176 RA - Relative Abundance

This check applies to the following analyses

	Type	Date Analyzed	Lab File ID	Sample ID
1	CCV	11/14/22 11:20	V111403	VSTD050
2	CCB	11/14/22 11:40	V111404	CCB
3	LCS	11/14/22 12:08	V111405	VLCSW-221114
4	MBLK	11/14/22 12:49	V111407	VBLKW-221114
5	SAMP	11/14/22 13:10	V111408	67WW15-221108
6	MS	11/14/22 13:30	V111409	HS22110553-06MS
7	MSD	11/14/22 13:51	V111410	HS22110553-06MSD
8	CCV_EN	11/14/22 14:11	V111411	VSTD050-END

right solutions.
right partner.

Form 6

Initial Calibration Data

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314
ICAL End Date 10-NOV-2022 1638

Calibration Files

Level 1 ..voa10.i\V221110.b\X111002.D
Level 2 ..voa10.i\V221110.b\X111003.D
Level 3 ..voa10.i\V221110.b\X111004.D
Level 4 ..voa10.i\V221110.b\X111005.D
Level 5 ..voa10.i\V221110.b\X111006.D
Level 6 ..voa10.i\V221110.b\X111007.D
Level 7 ..voa10.i\V221110.b\X111008.D
Level 8 ..voa10.i\V221110.b\X111009.D
Level 9 ..voa10.i\V221110.b\X111010.D
Level 10 ..voa10.i\V221110.b\X111011.D

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Dichlorodifluoromethane	NE 0.33168	0.41707 0.49375	0.42991 0.50927	0.41946 0.45567	0.41303	0.38310	AVRG		0.42810		12.63524	
Chloromethane	NE 0.38387	0.48108 0.48764	0.49530 0.48063	0.48081 0.48253	0.46535	0.44806	AVRG		0.46725		7.30236	
Propionitrile	NE 0.07282	0.06286 0.06995	0.08624 0.06960	0.08292 0.07179	0.08322	0.05500	AVRG		0.07271		13.98188	
Vinyl Chloride	NE 0.38086	0.46536 0.51077	0.47402 0.53607	0.43823 0.49074	0.44009	0.44020	AVRG		0.46404		9.90844	
Bromomethane	NE 0.16970	0.20665 0.24665	0.22767 0.22403	0.21934 0.18610	0.20763	0.19722	AVRG		0.20944		11.08523	
Chloroethane	NE 0.20548	0.27842 0.25906	0.27248 0.32024	0.24917 0.30716	0.26486	0.24873	AVRG		0.26729		12.62623	
Trichlorofluoromethane	NE 0.42575	0.67777 0.69268	0.59201 0.68259	0.62711 0.65843	0.60649	0.52520	AVRG		0.60978		14.29797	
Acrolein	NE 24619	183 39803	293 58475	599 98180	1818	7569	QUAD	-0.03614	51.14531	-17.86988	0.99516	*
Acetone	NE 218941	3505 427642	4443 606017	11188 877600	24899	83173	LINR	-0.10883	0.19414		0.99673	
1,1-Dichloroethene	NE 144416	1548 370701	2441 NE	6127 NE	16202	67448	QUAD	-0.02285	3.77555	-1.40717	0.99778	

NE - Not Evaluated, AVRG - Averaged, LINR - Linear Regression, WLIN - Weighted Linear, QUAD - Quadratic, * - Curve Fit Outside Limits

Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Isobutyl Alcohol	NE 0.07557	0.07751 0.08077	0.07564 0.08384	0.07736 0.08830	0.07172	0.07094	AVRG		0.07796		7.16022	
Acetonitrile	NE 0.06575	0.07571 0.05526	0.08762 0.06668	0.07239 0.06701	0.07409	0.06497	AVRG		0.06994		12.85115	
Allyl Chloride	NE 0.97885	1.23991 0.94195	1.24526 1.01028	1.07679 1.10563	1.05897	0.96067	AVRG		1.06870		10.52589	
Iodomethane	NE 355942	1488 858110	2870 1351419	8375 2149405	22802	112670	QUAD	0.08584	2.50623	-0.10475	0.99890	
Acrylonitrile	NE 0.18724	0.16856 0.18829	0.19359 0.15848	0.19243 0.17575	0.19677	0.19854	AVRG		0.18441		7.48156	
Methylene Chloride	NE 200956	2905 325588	3710 491109	9066 904304	21548	81339	QUAD	-0.07477	3.46762	-0.52540	0.99355	
Methyl tert-butyl ether	NE 1.35120	1.06671 1.31696	1.39559 1.16898	1.23534 1.32572	1.33798	1.29729	AVRG		1.27731		8.08388	
Carbon Disulfide	NE 878513	11091 1659683	13923 3203085	39423 4808317	82677	385826	QUAD	-0.02018	1.21212	-0.03233	0.99548	
trans-1,2-Dichloroethene	NE 0.35477	0.37255 0.39916	0.48838 0.34057	0.36076 0.36993	0.36426	0.39174	AVRG		0.38246		11.38330	
Vinyl Acetate	NE 1.00834	0.92639 1.02021	1.02589 1.05402	0.95598 1.03606	1.03034	1.06944	AVRG		1.01408		4.50313	
1,1-Dichloroethane	NE 336253	2831 740355	3616 NE	14716 NE	35092	151831	QUAD	-0.01207	1.52107	-0.10844	0.99891	
Chloroprene	NE 0.51430	0.50412 0.68410	0.63059 0.69052	0.58027 0.69990	0.60336	0.64668	AVRG		0.61709		11.83499	

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Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
2-Butanone	NE 0.25017	0.24032 0.24902	0.30569 0.25183	0.25821 0.24293	0.30162	0.23368	AVRG		0.25928		10.08888	
Methacrylonitrile	NE 0.43854	0.37919 0.42280	0.39392 0.44655	0.42014 0.42138	0.41249	0.41458	AVRG		0.41662		4.93849	
2,2-Dichloropropane	NE 0.48979	0.66758 0.61770	0.61675 0.60102	0.61628 0.59495	0.65472	0.58780	AVRG		0.60518		8.36444	
cis-1,2-Dichloroethene	NE 0.42155	0.45450 0.45377	0.54305 0.42092	0.48909 0.41231	0.47055	0.42550	AVRG		0.45458		9.24499	
Chloroform	NE 0.73469	0.88708 0.76757	0.96188 0.73057	0.90792 0.73735	0.90275	0.76290	AVRG		0.82141		11.16659	
Bromochloromethane	NE 0.23046	0.21219 0.21918	0.23805 0.20675	0.24645 0.19998	0.25536	0.23851	AVRG		0.22744		8.32452	
1,1,1-Trichloroethane	NE 0.50785	0.65584 0.64244	0.76310 0.64024	0.74727 0.64989	0.71230	0.62049	AVRG		0.65994		11.55404	
1,1-Dichloropropene	NE 0.30985	0.40692 0.40180	0.38644 0.39437	0.39378 0.40261	0.37292	0.39912	AVRG		0.38531		7.80295	
1,2-Dichloroethane	NE 0.42236	0.49689 0.43850	0.48514 0.42354	0.50409 0.43728	0.50264	0.44802	AVRG		0.46205		7.49168	
Carbon Tetrachloride	NE 0.25746	0.35064 0.36458	0.31649 0.36586	0.31484 0.38480	0.32831	0.31747	AVRG		0.33338		11.44250	
Benzene	NE 1.13821	1.35438 1.23412	1.29023 1.20317	1.39735 1.21261	1.37869	1.24662	AVRG		1.27282		6.94163	
Trichloroethene	NE 0.28460	0.32719 0.32443	0.34745 0.31674	0.34621 0.31211	0.33994	0.33291	AVRG		0.32573		6.04985	

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Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Bromodichloromethane	NE 0.36527	0.40920 0.38291	0.41741 0.37844	0.42299 0.38299	0.42904	0.38504	AVRG		0.39703		5.74153	
Methyl Methacrylate	NE 0.48559	0.51364 0.50846	0.49841 0.52751	0.50338 0.54351	0.46083	0.44694	AVRG		0.49870		6.12464	
2-Chloroethylvinyl ether	NE 0.13376	0.14974 0.13870	0.13373 0.13834	0.13878 0.14287	0.11555	0.12310	AVRG		0.13495		7.59894	
1,2-Dichloropropane	NE 0.33074	0.41503 0.33915	0.35336 0.32665	0.39078 0.33063	0.36656	0.34793	AVRG		0.35565		8.49572	
2-Nitropropane	NE 0.30043	0.36657 0.30983	0.26400 0.31292	0.33105 0.31855	0.33641	0.27284	AVRG		0.31251		10.08978	
Dibromomethane	NE 0.18581	0.24020 0.18975	0.22982 0.18688	0.21578 0.18526	0.20782	0.19107	AVRG		0.20360		10.23613	
4-Methyl-2-Pentanone	NE 530824	8770 1115061	9918 1734551	29360 2694851	57554	210057	LINR	0.05766	0.46985		0.99795	
cis-1,3-Dichloropropene	NE 0.51734	0.50357 0.52970	0.55789 0.52458	0.58113 0.51894	0.52217	0.52031	AVRG		0.53063		4.49615	
Ethyl Methacrylate	NE 0.22069	0.20368 0.23203	0.15150 0.24245	0.21852 0.25019	0.20576	0.20064	AVRG		0.21394		13.59550	
Toluene	NE 1.37902	1.49733 1.51167	1.40938 1.45537	1.52364 1.54813	1.48846	1.45024	AVRG		1.47369		3.73512	
trans-1,3-Dichloropropene	NE 0.43715	0.49036 0.46307	0.48314 0.46539	0.50665 0.46801	0.44665	0.43619	AVRG		0.46629		5.16902	
2-Hexanone	NE 382051	6299 794391	7919 1204655	21835 1898739	46018	158977	LINR	0.03433	0.32916		0.99775	

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Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
1,1,2-Trichloroethane	NE	0.28774	0.31154	0.32822	0.31578	0.28460						
	0.27713	0.28317	0.27797	0.28807			AVRG		0.29491		6.30612	
1,3-Dichloropropane	NE	0.64251	0.62452	0.65492	0.61612	0.59377						
	0.57185	0.58068	0.56796	0.59993			AVRG		0.60581		5.09200	
Dibromochloromethane	NE	0.40642	0.41399	0.42122	0.36167	0.35286						
	0.35691	0.37621	0.37719	0.39691			AVRG		0.38482		6.66155	
Tetrachloroethene	NE	0.34035	0.25425	0.31396	0.31827	0.29962						
	0.25448	0.32219	0.31986	0.32999			AVRG		0.30588		10.20561	
1,2-Dibromoethane	NE	0.37061	0.34457	0.43299	0.38005	0.34655						
	0.34389	0.34890	0.33497	0.34692			AVRG		0.36105		8.44164	
1-Chlorohexane	NE	0.27929	0.27727	0.27462	0.27117	0.24029						
	0.21748	0.30276	0.30801	0.30648			AVRG		0.27527		11.05071	
Chlorobenzene	NE	1.18963	1.08775	1.10888	0.97949	0.92378						
	0.89267	0.94776	0.93413	0.98806			AVRG		1.00579		9.95291	
1,1,1,2-Tetrachloroethane	NE	0.34795	0.40942	0.39920	0.34488	0.34151						
	0.33125	0.35019	0.34852	0.37042			AVRG		0.36037		7.50806	
Ethylbenzene	NE	0.58531	0.47752	0.49404	0.49365	0.46929						
	0.42021	0.49019	0.48124	0.52236			AVRG		0.49265		8.97200	
m,p-Xylenes	0.50941	0.69574	0.64560	0.64428	0.60757	0.58693						
	0.53083	0.59828	0.59987	0.64659			AVRG		0.60651		9.22512	
o-Xylene	NE	0.68877	0.59810	0.66747	0.59768	0.56964						
	0.53746	0.58063	0.58636	0.62583			AVRG		0.60577		7.87438	
Styrene	NE	1.21624	1.10553	1.19379	1.06799	1.02978						
	0.99824	1.06502	1.07212	1.15333			AVRG		1.10023		6.70178	

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Initial Calibration Data

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Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Bromoform	NE 164151	2377 364147	3052 577658	8918 NE	16993	66465	LINR	0.02321	0.29841		0.99802	
Isopropylbenzene	NE 1.20914	1.72946 1.49764	1.45862 1.53982	1.57035 1.68019	1.44520	1.39757	AVRG		1.50311		10.28993	
1,1,2,2-Tetrachloroethane	NE 322468	4805 665348	8355 1017292	19087 1597328	36143	132209	LINR	-0.00350	0.81764		0.99987	
1,2,3-Trichloropropane	NE 0.93298	1.20844 0.97425	1.14478 0.96201	1.32106 0.98467	1.08187	0.95569	AVRG		1.06286		12.77207	
trans-1,4-Dichloro-2-butene	NE 0.16146	0.22056 0.17189	0.19408 0.17285	0.19002 0.18942	0.17860	0.16375	AVRG		0.18251		10.06936	
n-Propylbenzene	NE 2.28211	3.25275 2.81428	2.13162 2.86804	2.83478 2.97851	2.75453	2.62961	AVRG		2.72736		12.57798	
Bromobenzene	NE 0.70615	0.88906 0.72439	0.64231 0.72451	0.93300 0.74074	0.77972	0.72820	AVRG		0.76312		12.04133	
1,3,5-Trimethylbenzene	NE 1.76838	2.56207 2.08638	1.60064 2.10962	2.07697 2.18247	1.99643	1.94731	AVRG		2.03670		13.20240	
2-Chlorotoluene	NE 635892	8907 1413135	10447 2200194	33419 3544893	67567	273531	LINR	0.02811	1.80443		0.99868	
4-Chlorotoluene	NE 1.87404	2.67752 2.07204	1.73252 2.08390	2.41045 2.15790	2.14367	2.01483	AVRG		2.12965		13.08939	
tert-Butylbenzene	NE 1.40692	2.27748 1.75680	1.56032 1.80779	1.78515 1.84230	1.74564	1.62764	AVRG		1.75667		13.64508	
1,2,4-Trimethylbenzene	NE 1.89799	2.59812 2.19093	2.27827 2.20106	2.29946 2.29405	2.10835	2.05067	AVRG		2.21321		8.80466	

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Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
sec-Butylbenzene	NE 1.88315	2.95379 2.56915	2.44404 2.61696	2.44508 2.67158	2.37963	2.25826	AVRG		2.46907		12.02141	
p-Isopropyltoluene	NE 1.80623	2.64475 2.34617	2.13034 2.35834	2.20866 2.45081	2.16734	2.10067	AVRG		2.24592		10.66607	
1,3-Dichlorobenzene	NE 1.28217	1.89408 1.38962	1.77066 1.38546	1.77642 1.42362	1.48540	1.33614	AVRG		1.52706		14.71637	
1,4-Dichlorobenzene	NE 548142	8982 1165737	15449 1798647	30465 2882615	62817	228364	LINR	0.01155	1.46611		0.99926	
n-Butylbenzene	NE 1.65143	2.63996 2.23499	2.12880 2.25788	2.10540 2.31451	2.04628	2.00298	AVRG		2.15358		12.38645	
1,2-Dichlorobenzene	NE 540647	8824 1127669	15233 1745661	27258 2713582	60205	225895	LINR	-0.00020	1.39378		0.99988	
1,2-Dibromo-3-Chloropropane	NE 0.14868	0.14797 0.15145	0.16385 0.15250	0.17747 0.14853	0.16569	0.13500	AVRG		0.15457		8.07325	
1,2,4-Trichlorobenzene	NE 388008	6080 886028	10119 1345565	21248 2033627	45748	170245	LINR	0.00094	1.05967		0.99907	
Hexachlorobutadiene	NE 158258	2181 444581	4764 NE	8250 NE	20241	80136	QUAD	-0.02985	2.81842	-0.87871	0.99598	
Naphthalene	NE 2.55791	2.78138 2.67994	3.53515 2.67765	3.21556 2.62968	2.64804	2.58481	AVRG		2.81224		11.91710	
1,2,3-Trichlorobenzene	NE 365195	5222 812095	10414 1242539	21009 1863854	42719	160233	LINR	-0.00521	0.97221		0.99917	
Ethyl Acetate	NE 0.60006	NE 0.60347	NE 0.61105	0.63517 0.63085	0.62185	0.47723	AVRG		0.59710		9.12539	*

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Initial Calibration Data

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Project LHAAP 67 November 2022

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Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Methyl Acrylate	NE 0.47225	NE 0.44510	NE 0.48833	NE 0.50157	0.46902	0.40154	AVRG		0.46297		7.69703	*
n-Butanol	NE 0.01304	0.02529 0.01384	0.03477 0.01439	0.02421 0.01529	0.01626	0.01300	AVRG		0.01890		39.94797	*
1,4-Dioxane	405 56661	690 116961	1329 177525	2541 289484	6196	22828	LINR	0.27734	0.00611		0.99835	
n-Hexane	NE 0.31590	0.40467 0.56772	0.86120 0.58126	0.45427 0.57688	0.43847	0.50622	AVRG		0.52295		29.60213	*
Freon TF	NE 125676	1399 373490	1766 NE	5610 NE	14418	56211	QUAD	-0.02460	4.51495	-2.41236	0.99819	
Methyl Acetate	NE 0.43272	0.42615 0.32183	0.40672 0.42144	0.43091 0.42047	0.41859	0.40761	AVRG		0.40961		8.33167	
Methylcyclohexane	NE 0.42911	0.48254 0.45218	0.43022 0.45055	0.52162 0.49581	0.40715	0.45441	AVRG		0.45818		7.85920	
Isopropyl alcohol	NE 0.03438	0.06703 0.02559	0.08993 0.03351	0.04618 0.03388	0.03423	0.03289	AVRG		0.04418		47.39322	*
4-Methyl-2-pentanol	NE 0.07484	0.14895 0.07942	0.11400 0.08865	0.11737 0.09818	0.09882	0.09334	AVRG		0.10151		22.32370	*
Tert-butyl alcohol	NE 0.04496	0.07344 0.04496	0.14271 0.04028	0.07557 0.04496	0.05229	0.04455	AVRG		0.06263		52.24499	*
Diethyl ether	NE 0.37351	0.25006 0.36156	0.44357 0.37658	0.36292 0.36904	0.29972	0.35489	AVRG		0.35465		15.12609	
1,3-Butadiene	NE 0.31928	0.35837 0.46853	0.63491 0.48353	0.38169 0.42720	0.38608	0.39675	AVRG		0.42848		21.68751	*

NE - Not Evaluated, AVRG - Averaged, LINR - Linear Regression, WLIN - Weighted Linear, QUAD - Quadratic, * - Curve Fit Outside Limits

Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Cyclohexane	NE 218836	2342 682169	3454 NE	8459 NE	21996	96410	QUAD	-0.01969	2.60145	-0.82086	0.99851	
Tetrahydrofuran	NE 0.10801	NE 0.09412	NE 0.09212	0.12305 0.10421	0.09906	0.09758	AVRG		0.10259		10.29890	*
Diisopropyl ether	NE 1.62304	NE 1.82406	2.19572 1.85127	1.61340 1.85254	1.55991	1.69257	AVRG		1.77657		11.52551	*
Dichlorofluoromethane	NE 0.57558	NE 0.69657	NE 0.71885	NE 0.73571	0.68459	0.57044	AVRG		0.66362		10.90882	*
2-Methylnaphthalene	NE 1.42913	2.45898 1.63440	1.81894 1.65362	1.62421 1.62989	1.45589	1.45419	AVRG		1.68436		18.75655	
1,2,3-Trimethylbenzene	NE 2.13561	2.31807 2.13618	2.01220 2.17542	2.18454 2.32426	2.07894	2.12109	AVRG		2.16515		4.72313	
Ethanol	NE 0.00565	NE 0.00576	NE 0.00635	0.01117 0.00593	0.00757	0.00584	AVRG		0.00690		28.97035	*
1,3,5-Trichlorobenzene	NE 0.90421	2.07406 1.00207	1.39750 0.99132	1.33018 0.96041	1.09432	0.98830	AVRG		1.19360		31.11127	*
3,3-Dimethyl-1-butanol	NE 0.04260	NE 0.04454	NE 0.04885	NE 0.05421	0.04796	0.04721	AVRG		0.04756		8.40432	*
tert-Amyl methyl ether	NE 1.39418	1.04234 1.46268	1.30736 1.49492	1.14898 1.54851	1.22134	1.27659	AVRG		1.32188		12.73637	
tert-Butyl ethyl ether	NE 1.45320	0.73026 1.57722	0.78542 1.54097	1.25769 1.50099	1.34315	1.27912	AVRG		1.27422		24.60369	*
tert-Amyl alcohol	NE 0.03056	NE 0.03322	0.08507 0.03494	0.07030 0.03893	0.04113	0.03047	AVRG		0.04558		45.07265	*

NE - Not Evaluated, AVRG - Averaged, LINR - Linear Regression, WLIN - Weighted Linear, QUAD - Quadratic, * - Curve Fit Outside Limits

Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

ICAL Start Date 10-NOV-2022 1314 **ICAL End Date** 10-NOV-2022 1638

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
1-Methylnaphthalene	NE 1.25821	2.25757 1.39434	1.62273 1.39249	1.55222 1.37787	1.33388	1.27895	AVRG		1.49647		20.65266	*
1,2-Dichloroethylene (total)	NE 0.38816	0.41353 0.42646	0.51571 0.38074	0.42493 0.39112	0.41741	0.40862	AVRG		0.41852		9.54801	
Xylenes (total)	NE 0.45291	0.62202 0.50872	0.58414 0.51766	0.58393 0.53886	0.51523	0.49939	AVRG		0.53587		9.73684	
Dibromofluoromethane	NE 0.38521	0.42017 0.41222	0.46520 0.40128	0.44418 0.38012	0.46897	0.42470	AVRG		0.42245		7.58137	
1,2-Dichloroethane-d4	NE 0.49038	0.61619 0.51025	0.58388 0.50357	0.53122 0.47720	0.58689	0.52884	AVRG		0.53649		8.99700	
Toluene-d8	NE 698101	11710 1660983	10487 2448194	30061 3513848	74726	328150	LINR	0.00554	1.26717		0.99863	
4-Bromofluorobenzene	NE 274831	4486 619939	5536 958342	15006 1437920	33924	125568	LINR	0.01883	0.50703		0.99878	

NE - Not Evaluated, AVRG - Averaged, LINR - Linear Regression, WLIN - Weighted Linear, QUAD - Quadratic, * - Curve Fit Outside Limits

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Form 6I

Initial Calibration Verification (ICV)

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Initial Calibration Verification (ICV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

Instrument ID voa10.i ICAL Date 10-NOV-2022
Lab File ID X111014.D ICAL Time 1537
?VAL? ?VAL? Conc Units ug/L
Analysis Type VOA Level LOW

Compound	Amount Added	Amount Recovered	% Recovered	Limits	Q
1,1,1,2-Tetrachlor	50.00	45.70	91.42	80-120	
1,1,1-Trichloroeth	50.00	41.38	82.76	80-120	
1,1,2,2-Tetrachlor	50.00	49.27	98.55	80-120	
Freon TF	50.00	45.57	91.16	80-120	
Methyl Acetate	50.00	40.09	80.19	80-120	
Cyclohexane	50.00	53.64	107.30	80-120	
Methylcyclohexane	50.00	44.59	89.19	80-120	
Carbon Disulfide	100.00	86.87	86.88	80-120	
2-Hexanone	100.00	96.80	96.80	80-120	
1,1,2-Trichloroeth	50.00	47.42	94.85	80-120	
1,1-Dichloroethane	50.00	44.52	89.05	80-120	
1,1-Dichloroethene	50.00	43.00	86.01	80-120	
1,1-Dichloropropen	50.00	43.05	86.12	80-120	
1,2,3-Trichloroben	50.00	47.39	94.80	80-120	
1,2,3-Trichloropro	50.00	44.73	89.48	80-120	
1,2,4-Trichloroben	50.00	47.97	95.95	80-120	
1,2,4-Trimethylben	50.00	44.53	89.07	80-120	
1,2-Dibromo-3-Chlo	50.00	46.26	92.54	80-120	
1,2-Dibromoethane	50.00	46.44	92.88	80-120	
Acrolein	100.00	95.35	95.36	80-120	
Acrylonitrile	100.00	82.51	82.52	80-120	
1,2-Dichlorobenzen	50.00	47.75	95.51	80-120	
1,2-Dichloroethane	50.00	44.33	88.66	80-120	
1,2-Dichloropropan	50.00	45.38	90.76	80-120	
1,3,5-Trimethylben	50.00	44.93	89.87	80-120	
1,3-Dichlorobenzen	50.00	42.98	85.97	80-120	
1,3-Dichloropropan	50.00	47.81	95.64	80-120	
1,4-Dichlorobenzen	50.00	47.48	94.97	80-120	
1-Chlorohexane	50.00	40.27	80.55	80-120	
2,2-Dichloropropan	50.00	44.13	88.26	80-120	
2-Butanone	100.00	95.80	95.80	80-120	
2-Chlorotoluene	50.00	45.54	91.09	80-120	
4-Chlorotoluene	50.00	45.62	91.25	80-120	
p-Isopropyltoluene	50.00	42.02	84.04	80-120	

Initial Calibration Verification (ICV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

Instrument ID voa10.i ICAL Date 10-NOV-2022
Lab File ID X111014.D ICAL Time 1537
?VAL? ?VAL? Conc Units ug/L
Analysis Type VOA Level LOW

Compound	Amount Added	Amount Recovered	% Recovered	Limits	Q
4-Methyl-2-Pentano	100.00	92.15	92.15	80-120	
Acetone	100.00	86.88	86.89	80-120	
Benzene	50.00	44.36	88.72	80-120	
Bromobenzene	50.00	45.93	91.88	80-120	
Bromochloromethane	50.00	50.00	100.01	80-120	
Bromodichlorometha	50.00	45.52	91.06	80-120	
Bromoform	50.00	47.66	95.34	80-120	
Bromomethane	50.00	54.69	109.39	80-120	
Carbon Tetrachlori	50.00	41.57	83.14	80-120	
Chlorobenzene	50.00	43.47	86.94	80-120	
Chloroethane	50.00	46.71	93.44	80-120	
Chloroform	50.00	43.96	87.93	80-120	
Chloromethane	50.00	47.37	94.75	80-120	
cis-1,2-Dichloroet	50.00	43.89	87.79	80-120	
cis-1,3-Dichloropr	50.00	48.19	96.40	80-120	
Dibromochlorometha	50.00	47.26	94.54	80-120	
Dibromomethane	50.00	44.88	89.77	80-120	
Dichlorodifluorome	50.00	44.37	88.74	80-120	
Ethylbenzene	50.00	44.50	89.00	80-120	
Hexachlorobutadien	50.00	48.34	96.69	80-120	
Isopropylbenzene	50.00	41.92	83.85	80-120	
m,p-Xylenes	100.00	89.88	89.88	80-120	
Methyl tert-butyl	50.00	46.56	93.12	80-120	
Methylene Chloride	50.00	48.46	96.92	80-120	
n-Butylbenzene	50.00	40.47	80.95	80-120	
n-Propylbenzene	50.00	43.55	87.11	80-120	
Naphthalene	50.00	46.30	92.61	80-120	
o-Xylene	50.00	44.49	88.99	80-120	
sec-Butylbenzene	50.00	40.15	80.30	80-120	
Styrene	50.00	45.45	90.90	80-120	
tert-Butylbenzene	50.00	41.25	82.51	80-120	
Tetrachloroethene	50.00	44.68	89.37	80-120	
Toluene	50.00	47.52	95.04	80-120	
trans-1,2-Dichloro	50.00	40.55	81.10	80-120	

Initial Calibration Verification (ICV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421606

Volatiles Organics by Method 8260C

Instrument ID voa10.i ICAL Date 10-NOV-2022
Lab File ID X111014.D ICAL Time 1537
?VAL? ?VAL? Conc Units ug/L
Analysis Type VOA Level LOW

Compound	Amount Added	Amount Recovered	% Recovered	Limits	Q
trans-1,3-Dichloro	50.00	47.35	94.72	80-120	
Trichloroethene	50.00	43.96	87.94	80-120	
Trichlorofluoromet	50.00	43.47	86.96	80-120	
Vinyl Chloride	50.00	47.01	94.03	80-120	
1,2-Dichloroethyle	50.00	84.44	168.89*	80-120	
Xylenes (total)	150.00	134.37	89.58	80-120	
1,4-Dioxane	1000.00	966.31	96.63	80-120	
Dibromofluorometha	50.00	52.28	104.57	70-130	
1,2-Dichloroethane	50.00	49.50	99.02	70-130	
Toluene-d8	50.00	55.18	110.37	70-130	
4-Bromofluorobenze	50.00	50.99	102.00	70-130	

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Form 7

Continuing Calibration Verification (CCV)

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421680

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 13-NOV-2022 1155
Lab File ID V111303.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050 Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
Dichlorodifluoromethane	0.42810	0.47921	0.47921	0.100	-11.93714	20.0	Averaged	
Chloromethane	0.46725	0.48945	0.48945	0.100	-4.74962	20.0	Averaged	
Vinyl Chloride	0.46404	0.49125	0.49125	0.100	-5.86515	20.0	Averaged	
Bromomethane	0.20944	0.22162	0.22162	0.100	-5.81359	20.0	Averaged	
Chloroethane	0.26729	0.28761	0.28761	0.100	-7.60307	20.0	Averaged	
Trichlorofluoromethane	0.60978	0.55896	0.55896	0.100	8.33378	20.0	Averaged	
Acrolein	100	104	0.02108	0.020	-4.43330	20.0	Quadratic	
Acetone	100	102	0.20866	0.100	-2.03860	20.0	Linear	
1,1-Dichloroethene	50.0	58.73409	0.36752	0.100	-17.46817	20.0	Quadratic	
Iodomethane	100	100	0.39334	0.100	0.36935	20.0	Quadratic	
Acrylonitrile	0.18441	0.17020	0.17020	0.050	7.70532	20.0	Averaged	
Methylene Chloride	50.0	59.80376	0.38947	0.100	-19.60752	20.0	Quadratic	
Methyl tert-butyl ether	1.27731	1.34451	1.34451	0.100	-5.26092	20.0	Averaged	
Carbon Disulfide	100	119	1.05261	0.100	-19.41617	20.0	Quadratic	
trans-1,2-Dichloroethene	0.38246	0.39539	0.39539	0.100	-3.38027	20.0	Averaged	
Vinyl Acetate	1.01408	1.07959	1.07959	0.010	-6.46103	20.0	Averaged	
1,1-Dichloroethane	50.0	55.72017	0.78445	0.200	-11.44034	20.0	Quadratic	
2-Butanone	0.25928	0.25730	0.25730	0.100	0.76090	20.0	Averaged	
2,2-Dichloropropane	0.60518	0.63521	0.63521	0.100	-4.96355	20.0	Averaged	
cis-1,2-Dichloroethene	0.45458	0.47137	0.47137	0.100	-3.69243	20.0	Averaged	
Chloroform	0.82141	0.78840	0.78840	0.200	4.01826	20.0	Averaged	
Bromochloromethane	0.22744	0.23201	0.23201	0.100	-2.00894	20.0	Averaged	
Dibromofluoromethane	0.42245	0.45011	0.45011	0.100	-6.54741	20.0	Averaged	
1,1,1-Trichloroethane	0.65994	0.62582	0.62582	0.100	5.16948	20.0	Averaged	
1,1-Dichloropropene	0.38531	0.38734	0.38734	0.100	-0.52544	20.0	Averaged	
1,2-Dichloroethane	0.46205	0.43256	0.43256	0.100	6.38324	20.0	Averaged	
Carbon Tetrachloride	0.33338	0.32930	0.32930	0.100	1.22457	20.0	Averaged	
1,2-Dichloroethane-d4	0.53649	0.54270	0.54270	0.100	-1.15649	20.0	Averaged	
Benzene	1.27282	1.23736	1.23736	0.500	2.78609	20.0	Averaged	
Trichloroethene	0.32573	0.31664	0.31664	0.200	2.79158	20.0	Averaged	
Bromodichloromethane	0.39703	0.38665	0.38665	0.200	2.61369	20.0	Averaged	
2-Chloroethylvinyl ether	0.13495	0.13750	0.13750	0.001	-1.88994	20.0	Averaged	
1,2-Dichloropropane	0.35565	0.34942	0.34942	0.100	1.74984	20.0	Averaged	
Dibromomethane	0.20360	0.18750	0.18750	0.100	7.90882	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421680

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 13-NOV-2022 1155
Lab File ID V111303.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050 Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
4-Methyl-2-Pentanone	100	93.84670	0.42739	0.100	6.15330	20.0	Linear	
cis-1,3-Dichloropropene	0.53063	0.53565	0.53565	0.200	-0.94674	20.0	Averaged	
Toluene-d8	50.0	55.03982	1.38787	0.100	-10.07965	20.0	Linear	
Toluene	1.47369	1.48941	1.48941	0.400	-1.06652	20.0	Averaged	
trans-1,3-Dichloropropene	0.46629	0.45564	0.45564	0.100	2.28429	20.0	Averaged	
2-Hexanone	100	92.62961	0.29925	0.100	7.37039	20.0	Linear	
1,1,2-Trichloroethane	0.29491	0.28264	0.28264	0.100	4.16112	20.0	Averaged	
1,3-Dichloropropane	0.60581	0.58252	0.58252	0.100	3.84406	20.0	Averaged	
Dibromochloromethane	0.38482	0.36352	0.36352	0.100	5.53602	20.0	Averaged	
Tetrachloroethene	0.30588	0.29022	0.29022	0.200	5.12038	20.0	Averaged	
1,2-Dibromoethane	0.36105	0.34364	0.34364	0.100	4.82257	20.0	Averaged	
1-Chlorohexane	0.27527	0.24890	0.24890	0.100	9.57737	20.0	Averaged	
Chlorobenzene	1.00579	0.91252	0.91252	0.500	9.27381	20.0	Averaged	
1,1,1,2-Tetrachloroethane	0.36037	0.34353	0.34353	0.100	4.67296	20.0	Averaged	
Ethylbenzene	0.49265	0.44630	0.44630	0.100	9.40827	20.0	Averaged	
m,p-Xylenes	0.60651	0.55264	0.55264	0.100	8.88212	20.0	Averaged	
o-Xylene	0.60577	0.55479	0.55479	0.300	8.41623	20.0	Averaged	
Styrene	1.10023	0.99819	0.99819	0.300	9.27438	20.0	Averaged	
Bromoform	50.0	46.05077	0.26791	0.100	7.89845	20.0	Linear	
Isopropylbenzene	1.50311	1.28038	1.28038	0.100	14.81778	20.0	Averaged	
1,1,2,2-Tetrachloroethane	50.0	48.56991	0.79712	0.300	2.86018	20.0	Linear	
4-Bromofluorobenzene	50.0	49.59664	0.49340	0.100	0.80672	20.0	Linear	
1,2,3-Trichloropropane	1.06286	0.95837	0.95837	0.100	9.83128	20.0	Averaged	
n-Propylbenzene	2.72736	2.51079	2.51079	0.100	7.94060	20.0	Averaged	
Bromobenzene	0.76312	0.72339	0.72339	0.100	5.20654	20.0	Averaged	
1,3,5-Trimethylbenzene	2.03670	1.87421	1.87421	0.100	7.97819	20.0	Averaged	
2-Chlorotoluene	50.0	47.17512	1.65176	0.100	5.64976	20.0	Linear	
4-Chlorotoluene	2.12965	1.97527	1.97527	0.100	7.24939	20.0	Averaged	
tert-Butylbenzene	1.75667	1.52915	1.52915	0.100	12.95205	20.0	Averaged	
1,2,4-Trimethylbenzene	2.21321	2.00879	2.00879	0.100	9.23629	20.0	Averaged	
sec-Butylbenzene	2.46907	2.11646	2.11646	0.100	14.28124	20.0	Averaged	
p-Isopropyltoluene	2.24592	1.97137	1.97137	0.100	12.22469	20.0	Averaged	
1,3-Dichlorobenzene	1.52706	1.33681	1.33681	0.600	12.45843	20.0	Averaged	
1,4-Dichlorobenzene	50.0	48.53690	1.40627	0.400	2.92619	20.0	Linear	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421680

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 13-NOV-2022 1155
Lab File ID V111303.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050 Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
n-Butylbenzene	2.15358	1.87825	1.87825	0.500	12.78462	20.0	Averaged	
1,2-Dichlorobenzene	50.0	48.86659	1.36246	0.400	2.26681	20.0	Linear	
1,2-Dibromo-3-Chloropropane	0.15457	0.14848	0.14848	0.050	3.94229	20.0	Averaged	
1,2,4-Trichlorobenzene	50.0	49.49327	1.04794	0.200	1.01346	20.0	Linear	
Hexachlorobutadiene	50.0	56.42973	0.48409	0.100	-12.85947	20.0	Quadratic	
Naphthalene	2.81224	2.65720	2.65720	0.200	5.51278	20.0	Averaged	
1,2,3-Trichlorobenzene	50.0	50.70087	0.99090	0.100	-1.40174	20.0	Linear	
1,2-Dichloroethylene (total	0.41852	0.43338	0.43338	0.200	-3.54980	20.0	Averaged	
Xylenes (total)	0.53587	0.46043	0.46043	0.100	14.07816	20.0	Averaged	
1,4-Dioxane	1000	803	0.00482	0.001	19.73786	20.0	Linear	
Cyclohexane	50.0	62.03167	0.59689	0.100	-24.06334	20.0	Quadratic	<-
Freon TF	50.0	59.18222	0.32354	0.100	-18.36443	20.0	Quadratic	
Methylcyclohexane	0.45818	0.36687	0.36687	0.100	19.92755	20.0	Averaged	
Methyl Acetate	0.40961	0.44024	0.44024	0.100	-7.47868	20.0	Averaged	
Tert-butyl alcohol	0.06263	0.04045	0.04045	0.005	35.41467	20.0	Averaged	<-
Isopropyl alcohol	0.04418	0.03155	0.03155	0.005	28.59455	20.0	Averaged	<-
trans-1,4-Dichloro-2-butene	0.18251	0.15820	0.15820	0.050	13.32361	20.0	Averaged	
Isobutyl Alcohol	0.07796	0.07466	0.07466	0.005	4.23727	20.0	Averaged	
Acetonitrile	0.06994	0.06394	0.06394	0.005	8.58617	20.0	Averaged	
Allyl Chloride	1.06870	1.44603	1.44603	0.100	-35.30691	20.0	Averaged	<-
Methacrylonitrile	0.41662	0.42729	0.42729	0.100	-2.55954	20.0	Averaged	
Methyl Methacrylate	0.49870	0.47955	0.47955	0.100	3.83994	20.0	Averaged	
Propionitrile	0.07271	0.07404	0.07404	0.010	-1.82555	20.0	Averaged	
Chloroprene	0.61709	0.68682	0.68682	0.100	-11.29995	20.0	Averaged	
Ethyl Methacrylate	0.21394	0.21847	0.21847	0.100	-2.11818	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421680

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 13-NOV-2022 2108
Lab File ID V111330.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
Dichlorodifluoromethane	0.42810	0.39866	0.39866	0.100	6.87798	50.0	Averaged	
Chloromethane	0.46725	0.45512	0.45512	0.100	2.59676	50.0	Averaged	
Vinyl Chloride	0.46404	0.45198	0.45198	0.100	2.59887	50.0	Averaged	
Bromomethane	0.20944	0.19745	0.19745	0.100	5.72759	50.0	Averaged	
Chloroethane	0.26729	0.26144	0.26144	0.100	2.18548	50.0	Averaged	
Trichlorofluoromethane	0.60978	0.56384	0.56384	0.100	7.53425	50.0	Averaged	
Acrolein	100	136	0.02748	0.020	-36.02269	50.0	Quadratic	
Acetone	100	82.22112	0.17019	0.100	17.77888	50.0	Linear	
1,1-Dichloroethene	50.0	51.37929	0.31526	0.100	-2.75858	50.0	Quadratic	
Iodomethane	100	90.70113	0.35533	0.100	9.29887	50.0	Quadratic	
Acrylonitrile	0.18441	0.19610	0.19610	0.050	-6.33964	50.0	Averaged	
Methylene Chloride	50.0	64.27202	0.41884	0.100	-28.54403	50.0	Quadratic	
Methyl tert-butyl ether	1.27731	1.34390	1.34390	0.100	-5.21320	50.0	Averaged	
Carbon Disulfide	100	116	1.01962	0.100	-15.85872	50.0	Quadratic	
trans-1,2-Dichloroethene	0.38246	0.37460	0.37460	0.100	2.05547	50.0	Averaged	
Vinyl Acetate	1.01408	0.76722	0.76722	0.010	24.34278	50.0	Averaged	
1,1-Dichloroethane	50.0	52.77685	0.74103	0.200	-5.55369	50.0	Quadratic	
2-Butanone	0.25928	0.25015	0.25015	0.100	3.51943	50.0	Averaged	
2,2-Dichloropropane	0.60518	0.51930	0.51930	0.100	14.19057	50.0	Averaged	
cis-1,2-Dichloroethene	0.45458	0.45091	0.45091	0.100	0.80715	50.0	Averaged	
Chloroform	0.82141	0.79618	0.79618	0.200	3.07118	50.0	Averaged	
Bromochloromethane	0.22744	0.24902	0.24902	0.100	-9.48875	50.0	Averaged	
Dibromofluoromethane	0.42245	0.46305	0.46305	0.100	-9.60943	50.0	Averaged	
1,1,1-Trichloroethane	0.65994	0.61288	0.61288	0.100	7.13021	50.0	Averaged	
1,1-Dichloropropene	0.38531	0.35713	0.35713	0.100	7.31558	50.0	Averaged	
1,2-Dichloroethane	0.46205	0.43820	0.43820	0.100	5.16193	50.0	Averaged	
Carbon Tetrachloride	0.33338	0.29829	0.29829	0.100	10.52674	50.0	Averaged	
1,2-Dichloroethane-d4	0.53649	0.55770	0.55770	0.100	-3.95328	50.0	Averaged	
Benzene	1.27282	1.21208	1.21208	0.500	4.77205	50.0	Averaged	
Trichloroethene	0.32573	0.30570	0.30570	0.200	6.15003	50.0	Averaged	
Bromodichloromethane	0.39703	0.37177	0.37177	0.200	6.36377	50.0	Averaged	
2-Chloroethylvinyl ether	0.13495	0.13580	0.13580	0.001	-0.62728	50.0	Averaged	
1,2-Dichloropropane	0.35565	0.33667	0.33667	0.100	5.33465	50.0	Averaged	
Dibromomethane	0.20360	0.18854	0.18854	0.100	7.39509	50.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421680

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 13-NOV-2022 2108
Lab File ID V111330.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
4-Methyl-2-Pentanone	100	91.50056	0.41637	0.100	8.49944	50.0	Linear	
cis-1,3-Dichloropropene	0.53063	0.51651	0.51651	0.200	2.65986	50.0	Averaged	
Toluene-d8	50.0	52.60426	1.32615	0.100	-5.20851	50.0	Linear	
Toluene	1.47369	1.38849	1.38849	0.400	5.78187	50.0	Averaged	
trans-1,3-Dichloropropene	0.46629	0.44517	0.44517	0.100	4.52948	50.0	Averaged	
2-Hexanone	100	90.94915	0.29372	0.100	9.05085	50.0	Linear	
1,1,2-Trichloroethane	0.29491	0.27753	0.27753	0.100	5.89460	50.0	Averaged	
1,3-Dichloropropane	0.60581	0.57858	0.57858	0.100	4.49418	50.0	Averaged	
Dibromochloromethane	0.38482	0.35363	0.35363	0.100	8.10567	50.0	Averaged	
Tetrachloroethene	0.30588	0.27095	0.27095	0.200	11.42100	50.0	Averaged	
1,2-Dibromoethane	0.36105	0.33695	0.33695	0.100	6.67442	50.0	Averaged	
1-Chlorohexane	0.27527	0.23097	0.23097	0.100	16.09074	50.0	Averaged	
Chlorobenzene	1.00579	0.88934	0.88934	0.500	11.57825	50.0	Averaged	
1,1,1,2-Tetrachloroethane	0.36037	0.33468	0.33468	0.100	7.12931	50.0	Averaged	
Ethylbenzene	0.49265	0.43437	0.43437	0.100	11.82824	50.0	Averaged	
m,p-Xylenes	0.60651	0.54289	0.54289	0.100	10.48983	50.0	Averaged	
o-Xylene	0.60577	0.53918	0.53918	0.300	10.99297	50.0	Averaged	
Styrene	1.10023	0.99576	0.99576	0.300	9.49518	50.0	Averaged	
Bromoform	50.0	46.04213	0.26786	0.100	7.91574	50.0	Linear	
Isopropylbenzene	1.50311	1.24143	1.24143	0.100	17.40956	50.0	Averaged	
1,1,2,2-Tetrachloroethane	50.0	46.10979	0.75689	0.300	7.78041	50.0	Linear	
4-Bromofluorobenzene	50.0	49.10171	0.48838	0.100	1.79657	50.0	Linear	
1,2,3-Trichloropropane	1.06286	0.93512	0.93512	0.100	12.01867	50.0	Averaged	
n-Propylbenzene	2.72736	2.33888	2.33888	0.100	14.24380	50.0	Averaged	
Bromobenzene	0.76312	0.69356	0.69356	0.100	9.11514	50.0	Averaged	
1,3,5-Trimethylbenzene	2.03670	1.77025	1.77025	0.100	13.08219	50.0	Averaged	
2-Chlorotoluene	50.0	45.44555	1.58934	0.100	9.10889	50.0	Linear	
4-Chlorotoluene	2.12965	1.89195	1.89195	0.100	11.16135	50.0	Averaged	
tert-Butylbenzene	1.75667	1.42113	1.42113	0.100	19.10122	50.0	Averaged	
1,2,4-Trimethylbenzene	2.21321	1.94036	1.94036	0.100	12.32837	50.0	Averaged	
sec-Butylbenzene	2.46907	1.96090	1.96090	0.100	20.58158	50.0	Averaged	
p-Isopropyltoluene	2.24592	1.82708	1.82708	0.100	18.64888	50.0	Averaged	
1,3-Dichlorobenzene	1.52706	1.29738	1.29738	0.600	15.04077	50.0	Averaged	
1,4-Dichlorobenzene	50.0	46.64119	1.35068	0.400	6.71761	50.0	Linear	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421680

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 13-NOV-2022 2108
Lab File ID V111330.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
n-Butylbenzene	2.15358	1.69247	1.69247	0.500	21.41151	50.0	Averaged	
1,2-Dichlorobenzene	50.0	48.08169	1.34058	0.400	3.83662	50.0	Linear	
1,2-Dibromo-3-Chloropropane	0.15457	0.14610	0.14610	0.050	5.48278	50.0	Averaged	
1,2,4-Trichlorobenzene	50.0	46.76199	0.99005	0.200	6.47602	50.0	Linear	
Hexachlorobutadiene	50.0	47.49204	0.39666	0.100	5.01592	50.0	Quadratic	
Naphthalene	2.81224	2.55194	2.55194	0.200	9.25571	50.0	Averaged	
1,2,3-Trichlorobenzene	50.0	48.12711	0.94086	0.100	3.74577	50.0	Linear	
1,2-Dichloroethylene (total	0.41852	0.41275	0.41275	0.200	1.37753	50.0	Averaged	
Xylenes (total)	0.53587	0.47252	0.47252	0.100	11.82221	50.0	Averaged	
1,4-Dioxane	1000	798	0.00479	0.001	20.22287	50.0	Linear	
Cyclohexane	50.0	56.72272	0.53345	0.100	-13.44545	50.0	Quadratic	
Freon TF	50.0	51.22107	0.27182	0.100	-2.44215	50.0	Quadratic	
Methylcyclohexane	0.45818	0.35511	0.35511	0.100	22.49454	50.0	Averaged	
Methyl Acetate	0.40961	0.44197	0.44197	0.100	-7.90116	50.0	Averaged	
Tert-butyl alcohol	0.06263	0.04319	0.04319	0.005	31.04133	50.0	Averaged	
Isopropyl alcohol	0.04418	0.03207	0.03207	0.005	27.40673	50.0	Averaged	
trans-1,4-Dichloro-2-butene	0.18251	0.15792	0.15792	0.050	13.47293	50.0	Averaged	
Isobutyl Alcohol	0.07796	0.07733	0.07733	0.005	0.80701	50.0	Averaged	
Acetonitrile	0.06994	0.06832	0.06832	0.005	2.31978	50.0	Averaged	
Allyl Chloride	1.06870	1.50523	1.50523	0.100	-40.84677	50.0	Averaged	
Methacrylonitrile	0.41662	0.45711	0.45711	0.100	-9.71712	50.0	Averaged	
Methyl Methacrylate	0.49870	0.47829	0.47829	0.100	4.09149	50.0	Averaged	
Propionitrile	0.07271	0.07966	0.07966	0.010	-9.55613	50.0	Averaged	
Chloroprene	0.61709	0.63902	0.63902	0.100	-3.55395	50.0	Averaged	
Ethyl Methacrylate	0.21394	0.21379	0.21379	0.100	0.06829	50.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421783

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 14-NOV-2022 1120
Lab File ID V111403.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050 Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
Dichlorodifluoromethane	0.42810	0.41111	0.41111	0.100	3.97017	20.0	Averaged	
Chloromethane	0.46725	0.44872	0.44872	0.100	3.96531	20.0	Averaged	
Vinyl Chloride	0.46404	0.45734	0.45734	0.100	1.44376	20.0	Averaged	
Bromomethane	0.20944	0.21622	0.21622	0.100	-3.23839	20.0	Averaged	
Chloroethane	0.26729	0.28618	0.28618	0.100	-7.06724	20.0	Averaged	
Trichlorofluoromethane	0.60978	0.57894	0.57894	0.100	5.05808	20.0	Averaged	
Acrolein	100	92.42908	0.01867	0.020	7.57092	20.0	Quadratic	<-
Acetone	100	81.65105	0.16908	0.100	18.34895	20.0	Linear	
1,1-Dichloroethene	50.0	56.90178	0.35425	0.100	-13.80355	20.0	Quadratic	
Iodomethane	100	96.26608	0.37899	0.100	3.73392	20.0	Quadratic	
Acrylonitrile	0.18441	0.15683	0.15683	0.050	14.95259	20.0	Averaged	
Methylene Chloride	50.0	59.21249	0.38561	0.100	-18.42498	20.0	Quadratic	
Methyl tert-butyl ether	1.27731	1.19590	1.19590	0.100	6.37297	20.0	Averaged	
Carbon Disulfide	100	112	0.98064	0.100	-11.63841	20.0	Quadratic	
trans-1,2-Dichloroethene	0.38246	0.33369	0.33369	0.100	12.75218	20.0	Averaged	
Vinyl Acetate	1.01408	1.20535	1.20535	0.010	-18.86233	20.0	Averaged	
1,1-Dichloroethane	50.0	54.00648	0.75913	0.200	-8.01295	20.0	Quadratic	
2-Butanone	0.25928	0.25938	0.25938	0.100	-0.04035	20.0	Averaged	
2,2-Dichloropropane	0.60518	0.60072	0.60072	0.100	0.73564	20.0	Averaged	
cis-1,2-Dichloroethene	0.45458	0.44410	0.44410	0.100	2.30691	20.0	Averaged	
Chloroform	0.82141	0.74462	0.74462	0.200	9.34887	20.0	Averaged	
Bromochloromethane	0.22744	0.21898	0.21898	0.100	3.71832	20.0	Averaged	
Dibromofluoromethane	0.42245	0.42145	0.42145	0.100	0.23614	20.0	Averaged	
1,1,1-Trichloroethane	0.65994	0.59978	0.59978	0.100	9.11564	20.0	Averaged	
1,1-Dichloropropene	0.38531	0.37254	0.37254	0.100	3.31597	20.0	Averaged	
1,2-Dichloroethane	0.46205	0.41684	0.41684	0.100	9.78574	20.0	Averaged	
Carbon Tetrachloride	0.33338	0.31476	0.31476	0.100	5.58741	20.0	Averaged	
1,2-Dichloroethane-d4	0.53649	0.52195	0.52195	0.100	2.70986	20.0	Averaged	
Benzene	1.27282	1.18458	1.18458	0.500	6.93239	20.0	Averaged	
Trichloroethene	0.32573	0.30194	0.30194	0.200	7.30388	20.0	Averaged	
Bromodichloromethane	0.39703	0.36022	0.36022	0.200	9.27231	20.0	Averaged	
2-Chloroethylvinyl ether	0.13495	0.12971	0.12971	0.001	3.88054	20.0	Averaged	
1,2-Dichloropropane	0.35565	0.33597	0.33597	0.100	5.53222	20.0	Averaged	
Dibromomethane	0.20360	0.17315	0.17315	0.100	14.95357	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421783

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 14-NOV-2022 1120
Lab File ID V111403.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050 Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
4-Methyl-2-Pentanone	100	98.03550	0.44707	0.100	1.96450	20.0	Linear	
cis-1,3-Dichloropropene	0.53063	0.51387	0.51387	0.200	3.15767	20.0	Averaged	
Toluene-d8	50.0	55.17848	1.39139	0.100	-10.35696	20.0	Linear	
Toluene	1.47369	1.51204	1.51204	0.400	-2.60217	20.0	Averaged	
trans-1,3-Dichloropropene	0.46629	0.42542	0.42542	0.100	8.76439	20.0	Averaged	
2-Hexanone	100	94.81862	0.30646	0.100	5.18138	20.0	Linear	
1,1,2-Trichloroethane	0.29491	0.28074	0.28074	0.100	4.80599	20.0	Averaged	
1,3-Dichloropropane	0.60581	0.58842	0.58842	0.100	2.87051	20.0	Averaged	
Dibromochloromethane	0.38482	0.35508	0.35508	0.100	7.72742	20.0	Averaged	
Tetrachloroethene	0.30588	0.30870	0.30870	0.200	-0.91970	20.0	Averaged	
1,2-Dibromoethane	0.36105	0.33980	0.33980	0.100	5.88674	20.0	Averaged	
1-Chlorohexane	0.27527	0.25922	0.25922	0.100	5.82804	20.0	Averaged	
Chlorobenzene	1.00579	0.88272	0.88272	0.500	12.23694	20.0	Averaged	
1,1,1,2-Tetrachloroethane	0.36037	0.33635	0.33635	0.100	6.66548	20.0	Averaged	
Ethylbenzene	0.49265	0.46482	0.46482	0.100	5.64910	20.0	Averaged	
m,p-Xylenes	0.60651	0.56159	0.56159	0.100	7.40559	20.0	Averaged	
o-Xylene	0.60577	0.54232	0.54232	0.300	10.47522	20.0	Averaged	
Styrene	1.10023	0.96843	0.96843	0.300	11.97898	20.0	Averaged	
Bromoform	50.0	44.48504	0.25857	0.100	11.02991	20.0	Linear	
Isopropylbenzene	1.50311	1.32721	1.32721	0.100	11.70226	20.0	Averaged	
1,1,2,2-Tetrachloroethane	50.0	48.11539	0.78968	0.300	3.76922	20.0	Linear	
4-Bromofluorobenzene	50.0	47.39430	0.47106	0.100	5.21141	20.0	Linear	
1,2,3-Trichloropropane	1.06286	0.90376	0.90376	0.100	14.96957	20.0	Averaged	
n-Propylbenzene	2.72736	2.61261	2.61261	0.100	4.20731	20.0	Averaged	
Bromobenzene	0.76312	0.69271	0.69271	0.100	9.22583	20.0	Averaged	
1,3,5-Trimethylbenzene	2.03670	1.91754	1.91754	0.100	5.85069	20.0	Averaged	
2-Chlorotoluene	50.0	46.79755	1.63813	0.100	6.40489	20.0	Linear	
4-Chlorotoluene	2.12965	1.96684	1.96684	0.100	7.64504	20.0	Averaged	
tert-Butylbenzene	1.75667	1.56442	1.56442	0.100	10.94429	20.0	Averaged	
1,2,4-Trimethylbenzene	2.21321	1.99541	1.99541	0.100	9.84078	20.0	Averaged	
sec-Butylbenzene	2.46907	2.19183	2.19183	0.100	11.22864	20.0	Averaged	
p-Isopropyltoluene	2.24592	2.05798	2.05798	0.100	8.36831	20.0	Averaged	
1,3-Dichlorobenzene	1.52706	1.30220	1.30220	0.600	14.72517	20.0	Averaged	
1,4-Dichlorobenzene	50.0	47.20388	1.36718	0.400	5.59223	20.0	Linear	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421783

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 14-NOV-2022 1120
Lab File ID V111403.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050 Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
n-Butylbenzene	2.15358	1.97906	1.97906	0.500	8.10368	20.0	Averaged	
1,2-Dichlorobenzene	50.0	47.67975	1.32937	0.400	4.64051	20.0	Linear	
1,2-Dibromo-3-Chloropropane	0.15457	0.14688	0.14688	0.050	4.97352	20.0	Averaged	
1,2,4-Trichlorobenzene	50.0	48.51781	1.02726	0.200	2.96438	20.0	Linear	
Hexachlorobutadiene	50.0	55.13544	0.47101	0.100	-10.27088	20.0	Quadratic	
Naphthalene	2.81224	2.54646	2.54646	0.200	9.45066	20.0	Averaged	
1,2,3-Trichlorobenzene	50.0	48.35479	0.94528	0.100	3.29042	20.0	Linear	
1,2-Dichloroethylene (total	0.41852	0.38889	0.38889	0.200	7.07953	20.0	Averaged	
Xylenes (total)	0.53587	0.43859	0.43859	0.100	18.15314	20.0	Averaged	
1,4-Dioxane	1000	783	0.00470	0.001	21.70281	20.0	Linear	<-
Cyclohexane	50.0	61.98786	0.59635	0.100	-23.97573	20.0	Quadratic	<-
Freon TF	50.0	63.30477	0.35212	0.100	-26.60955	20.0	Quadratic	<-
Methylcyclohexane	0.45818	0.42860	0.42860	0.100	6.45486	20.0	Averaged	
Methyl Acetate	0.40961	0.43913	0.43913	0.100	-7.20820	20.0	Averaged	
Tert-butyl alcohol	0.06263	0.04423	0.04423	0.005	29.38859	20.0	Averaged	<-
Isopropyl alcohol	0.04418	0.03331	0.03331	0.005	24.60447	20.0	Averaged	<-
trans-1,4-Dichloro-2-butene	0.18251	0.15255	0.15255	0.050	16.41795	20.0	Averaged	
Isobutyl Alcohol	0.07796	0.07686	0.07686	0.005	1.41027	20.0	Averaged	
Acetonitrile	0.06994	0.06847	0.06847	0.005	2.09990	20.0	Averaged	
Allyl Chloride	1.06870	1.48382	1.48382	0.100	-38.84311	20.0	Averaged	<-
Methacrylonitrile	0.41662	0.42544	0.42544	0.100	-2.11640	20.0	Averaged	
Methyl Methacrylate	0.49870	0.49244	0.49244	0.100	1.25401	20.0	Averaged	
Propionitrile	0.07271	0.07182	0.07182	0.010	1.22267	20.0	Averaged	
Chloroprene	0.61709	0.67143	0.67143	0.100	-8.80535	20.0	Averaged	
Ethyl Methacrylate	0.21394	0.21880	0.21880	0.100	-2.26923	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421783

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 14-NOV-2022 1411
Lab File ID V111411.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
Dichlorodifluoromethane	0.42810	0.47206	0.47206	0.100	-10.26636	20.0	Averaged	
Chloromethane	0.46725	0.52722	0.52722	0.100	-12.83427	20.0	Averaged	
Vinyl Chloride	0.46404	0.50796	0.50796	0.100	-9.46451	20.0	Averaged	
Bromomethane	0.20944	0.21586	0.21586	0.100	-3.06276	20.0	Averaged	
Chloroethane	0.26729	0.30998	0.30998	0.100	-15.97359	20.0	Averaged	
Trichlorofluoromethane	0.60978	0.66706	0.66706	0.100	-9.39421	20.0	Averaged	
Acrolein	100	112	0.02262	0.020	-12.04926	20.0	Quadratic	
Acetone	100	88.42017	0.18222	0.100	11.57983	20.0	Linear	
1,1-Dichloroethene	50.0	48.77317	0.29737	0.100	2.45366	20.0	Quadratic	
Iodomethane	100	110	0.43732	0.100	-9.88662	20.0	Quadratic	
Acrylonitrile	0.18441	0.21168	0.21168	0.050	-14.79324	20.0	Averaged	
Methylene Chloride	50.0	66.31485	0.43237	0.100	-32.62971	20.0	Quadratic	<-
Methyl tert-butyl ether	1.27731	1.40174	1.40174	0.100	-9.74200	20.0	Averaged	
Carbon Disulfide	100	125	1.10888	0.100	-25.45011	20.0	Quadratic	<-
trans-1,2-Dichloroethene	0.38246	0.41248	0.41248	0.100	-7.85088	20.0	Averaged	
Vinyl Acetate	1.01408	1.13084	1.13084	0.010	-11.51429	20.0	Averaged	
1,1-Dichloroethane	50.0	56.48764	0.79582	0.200	-12.97529	20.0	Quadratic	
2-Butanone	0.25928	0.23973	0.23973	0.100	7.53975	20.0	Averaged	
2,2-Dichloropropane	0.60518	0.62204	0.62204	0.100	-2.78686	20.0	Averaged	
cis-1,2-Dichloroethene	0.45458	0.46108	0.46108	0.100	-1.43045	20.0	Averaged	
Chloroform	0.82141	0.81596	0.81596	0.200	0.66315	20.0	Averaged	
Bromochloromethane	0.22744	0.23995	0.23995	0.100	-5.50373	20.0	Averaged	
Dibromofluoromethane	0.42245	0.45480	0.45480	0.100	-7.65856	20.0	Averaged	
1,1,1-Trichloroethane	0.65994	0.66366	0.66366	0.100	-0.56348	20.0	Averaged	
1,1-Dichloropropene	0.38531	0.40396	0.40396	0.100	-4.83977	20.0	Averaged	
1,2-Dichloroethane	0.46205	0.43754	0.43754	0.100	5.30379	20.0	Averaged	
Carbon Tetrachloride	0.33338	0.33951	0.33951	0.100	-1.83819	20.0	Averaged	
1,2-Dichloroethane-d4	0.53649	0.57018	0.57018	0.100	-6.28011	20.0	Averaged	
Benzene	1.27282	1.23339	1.23339	0.500	3.09811	20.0	Averaged	
Trichloroethene	0.32573	0.32597	0.32597	0.200	-0.07257	20.0	Averaged	
Bromodichloromethane	0.39703	0.39103	0.39103	0.200	1.51116	20.0	Averaged	
2-Chloroethylvinyl ether	0.13495	0.13611	0.13611	0.001	-0.86067	20.0	Averaged	
1,2-Dichloropropane	0.35565	0.35074	0.35074	0.100	1.37851	20.0	Averaged	
Dibromomethane	0.20360	0.18972	0.18972	0.100	6.81595	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421783

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 14-NOV-2022 1411
Lab File ID V111411.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
4-Methyl-2-Pentanone	100	90.30995	0.41077	0.100	9.69005	20.0	Linear	
cis-1,3-Dichloropropene	0.53063	0.53633	0.53633	0.200	-1.07474	20.0	Averaged	
Toluene-d8	50.0	53.33413	1.34465	0.100	-6.66826	20.0	Linear	
Toluene	1.47369	1.45544	1.45544	0.400	1.23866	20.0	Averaged	
trans-1,3-Dichloropropene	0.46629	0.44688	0.44688	0.100	4.16234	20.0	Averaged	
2-Hexanone	100	89.26563	0.28818	0.100	10.73437	20.0	Linear	
1,1,2-Trichloroethane	0.29491	0.28182	0.28182	0.100	4.43947	20.0	Averaged	
1,3-Dichloropropane	0.60581	0.58793	0.58793	0.100	2.95040	20.0	Averaged	
Dibromochloromethane	0.38482	0.36417	0.36417	0.100	5.36553	20.0	Averaged	
Tetrachloroethene	0.30588	0.29792	0.29792	0.200	2.60238	20.0	Averaged	
1,2-Dibromoethane	0.36105	0.34033	0.34033	0.100	5.73905	20.0	Averaged	
1-Chlorohexane	0.27527	0.26021	0.26021	0.100	5.46892	20.0	Averaged	
Chlorobenzene	1.00579	0.90999	0.90999	0.500	9.52549	20.0	Averaged	
1,1,1,2-Tetrachloroethane	0.36037	0.34430	0.34430	0.100	4.45983	20.0	Averaged	
Ethylbenzene	0.49265	0.45507	0.45507	0.100	7.62677	20.0	Averaged	
m,p-Xylenes	0.60651	0.56449	0.56449	0.100	6.92844	20.0	Averaged	
o-Xylene	0.60577	0.55050	0.55050	0.300	9.12378	20.0	Averaged	
Styrene	1.10023	1.00454	1.00454	0.300	8.69699	20.0	Averaged	
Bromoform	50.0	46.01113	0.26767	0.100	7.97773	20.0	Linear	
Isopropylbenzene	1.50311	1.34541	1.34541	0.100	10.49148	20.0	Averaged	
1,1,2,2-Tetrachloroethane	50.0	47.76305	0.78392	0.300	4.47390	20.0	Linear	
4-Bromofluorobenzene	50.0	50.00292	0.49752	0.100	-0.00583	20.0	Linear	
1,2,3-Trichloropropane	1.06286	0.91296	0.91296	0.100	14.10339	20.0	Averaged	
n-Propylbenzene	2.72736	2.49593	2.49593	0.100	8.48534	20.0	Averaged	
Bromobenzene	0.76312	0.68487	0.68487	0.100	10.25431	20.0	Averaged	
1,3,5-Trimethylbenzene	2.03670	1.88608	1.88608	0.100	7.39542	20.0	Averaged	
2-Chlorotoluene	50.0	46.88426	1.64126	0.100	6.23148	20.0	Linear	
4-Chlorotoluene	2.12965	1.90998	1.90998	0.100	10.31490	20.0	Averaged	
tert-Butylbenzene	1.75667	1.54028	1.54028	0.100	12.31808	20.0	Averaged	
1,2,4-Trimethylbenzene	2.21321	1.97416	1.97416	0.100	10.80095	20.0	Averaged	
sec-Butylbenzene	2.46907	2.15187	2.15187	0.100	12.84714	20.0	Averaged	
p-Isopropyltoluene	2.24592	1.99227	1.99227	0.100	11.29398	20.0	Averaged	
1,3-Dichlorobenzene	1.52706	1.28251	1.28251	0.600	16.01485	20.0	Averaged	
1,4-Dichlorobenzene	50.0	46.76736	1.35438	0.400	6.46527	20.0	Linear	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110553

RunID VOA10_421783

Volatiles Organics by Method 8260C

Instrument ID voa10.i Injection Date 14-NOV-2022 1411
Lab File ID V111411.D ICAL Date(s) 10-NOV-2022 10-NOV-2022
Analysis Type WATER ICAL Times 1314 1638
Lab Sample ID VSTD050-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
n-Butylbenzene	2.15358	1.87595	1.87595	0.500	12.89149	20.0	Averaged	
1,2-Dichlorobenzene	50.0	46.87758	1.30701	0.400	6.24483	20.0	Linear	
1,2-Dibromo-3-Chloropropane	0.15457	0.13892	0.13892	0.050	10.12823	20.0	Averaged	
1,2,4-Trichlorobenzene	50.0	46.17772	0.97767	0.200	7.64455	20.0	Linear	
Hexachlorobutadiene	50.0	50.60819	0.42640	0.100	-1.21638	20.0	Quadratic	
Naphthalene	2.81224	2.46692	2.46692	0.200	12.27920	20.0	Averaged	
1,2,3-Trichlorobenzene	50.0	46.29603	0.90525	0.100	7.40794	20.0	Linear	
1,2-Dichloroethylene (total	0.41852	0.43678	0.43678	0.200	-4.36405	20.0	Averaged	
Xylenes (total)	0.53587	0.47062	0.47062	0.100	12.17761	20.0	Averaged	
1,4-Dioxane	1000	840	0.00505	0.001	16.00773	20.0	Linear	
Cyclohexane	50.0	64.85245	0.63232	0.100	-29.70490	20.0	Quadratic	<-
Freon TF	50.0	54.14742	0.29035	0.100	-8.29483	20.0	Quadratic	
Methylcyclohexane	0.45818	0.36764	0.36764	0.100	19.75929	20.0	Averaged	
Methyl Acetate	0.40961	0.43668	0.43668	0.100	-6.60958	20.0	Averaged	
Tert-butyl alcohol	0.06263	0.04206	0.04206	0.005	32.84895	20.0	Averaged	<-
Isopropyl alcohol	0.04418	0.03143	0.03143	0.005	28.86521	20.0	Averaged	<-
trans-1,4-Dichloro-2-butene	0.18251	0.16210	0.16210	0.050	11.18751	20.0	Averaged	
Isobutyl Alcohol	0.07796	0.07508	0.07508	0.005	3.68895	20.0	Averaged	
Acetonitrile	0.06994	0.06626	0.06626	0.005	5.26844	20.0	Averaged	
Allyl Chloride	1.06870	0.98386	0.98386	0.100	7.93912	20.0	Averaged	
Methacrylonitrile	0.41662	0.43479	0.43479	0.100	-4.36001	20.0	Averaged	
Methyl Methacrylate	0.49870	0.48024	0.48024	0.100	3.70172	20.0	Averaged	
Propionitrile	0.07271	0.07367	0.07367	0.010	-1.31946	20.0	Averaged	
Chloroprene	0.61709	0.70377	0.70377	0.100	-14.04681	20.0	Averaged	
Ethyl Methacrylate	0.21394	0.20500	0.20500	0.100	4.17872	20.0	Averaged	

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Form 8

Internal Standard Area and RT Summary

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 8 - Internal Standard Area and RT Summary

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421680

		IS1				IS2				IS3				IS4			
Sample ID	File ID	Area		RT		Area		RT		Area		RT		Area		RT	
12-HOUR STD (CCV)	V111303	504297	#	4.92	#	755397	#	5.64	#	628544	#	8.27	#	384414	#	10.25	#
CCB	V111304	482087		4.92		730334		5.64		626042		8.27		400143		10.25	
VLCSW-221113	V111305	474019		4.92		732654		5.64		627550		8.27		393141		10.25	
VBLKW-221113	V111307	495557		4.91		757916		5.64		647379		8.27		406221		10.25	
ZZZZZZMS	V111309	513101		4.92		768253		5.64		639016		8.27		414741		10.25	
ZZZZZZMSD	V111310	505260		4.91		759875		5.64		645008		8.27		415382		10.25	
HS22110553-14	V111315	467386		4.92		717865		5.64		636976		8.27		400173		10.25	
HS22110553-01	V111317	456203		4.91		701483		5.64		636455		8.27		406522		10.25	
HS22110553-02	V111318	459932		4.91		715815		5.64		637256		8.27		418599		10.25	
HS22110553-03	V111319	478672		4.92		703529		5.64		636362		8.27		404827		10.25	
HS22110553-04	V111320	462925		4.91		688468		5.65		643334		8.27		412281		10.25	
HS22110553-07	V111321	441431		4.91		675050		5.64		616796		8.27		373251		10.26	
HS22110553-08	V111322	460226		4.92		685050		5.64		605995		8.27		386593		10.25	
HS22110553-09	V111323	470829		4.91		711616		5.64		625245		8.27		399819		10.25	
HS22110553-10	V111324	458787		4.92		691917		5.64		615161		8.27		402691		10.25	
HS22110553-11	V111325	468865		4.92		709778		5.64		633593		8.27		423848		10.25	
HS22110553-13	V111326	462950		4.92		682124		5.65		621676		8.27		389207		10.25	
HS22110553-05	V111327	471637		4.92		707166		5.64		627202		8.27		405860		10.25	
HS22110553-12	V111328	454185		4.91		684900		5.64		627397		8.27		398091		10.25	
HS22110553-06	V111329	467919		4.92		703338		5.64		631212		8.27		411700		10.25	
VSTD050-END	V111330	445004		4.92		683508		5.65		596271		8.27		377907		10.25	

IS1 - Pentafluorobenzene IS2 - 1,4-Difluorobenzene IS3 - Chlorobenzene-d5 IS4 - 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of 12H STD IS Area
AREA LOWER LIMIT = - 50% of 12H STD IS Area
RT - Retention Time IS - Internal Standard

RT UPPER LIMIT = + 0.50 of 12H STD IS RT
RT LOWER LIMIT = - 0.50 of 12H STD IS RT
CCV - Continuing Calibration Verification

- Area or RT Limit Flag
* - Value Outside Area or RT limits
H - Hour STD - Standard

Form 8 - Internal Standard Area and RT Summary

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RunID
VOA10_421783

		IS1				IS2				IS3				IS4			
Sample ID	File ID	Area		RT		Area		RT		Area		RT		Area		RT	
12-HOUR STD (CCV)	V111403	528961	#	4.92	#	795146	#	5.64	#	628182	#	8.27	#	378108	#	10.25	#
CCB	V111404	392534		4.92		717826		5.64		606278		8.27		384988		10.25	
VLCSW-221114	V111405	466568		4.91		742505		5.64		608026		8.27		390264		10.25	
VBLKW-221114	V111407	450182		4.92		685634		5.64		583710		8.27		370789		10.25	
HS22110553-06	V111408	455309		4.92		688482		5.65		621981		8.27		398151		10.25	
HS22110553-06MS	V111409	491535		4.91		731182		5.64		622267		8.27		404903		10.25	
HS22110553-06MSD	V111410	473620		4.91		727439		5.64		606205		8.27		377283		10.25	
VSTD050-END	V111411	458866		4.92		711560		5.65		598170		8.27		386931		10.25	

IS1 - Pentafluorobenzene IS2 - 1,4-Difluorobenzene IS3 - Chlorobenzene-d5 IS4 - 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of 12H STD IS Area
AREA LOWER LIMIT = - 50% of 12H STD IS Area
RT - Retention Time IS - Internal Standard

RT UPPER LIMIT = + 0.50 of 12H STD IS RT
RT LOWER LIMIT = - 0.50 of 12H STD IS RT
CCV - Continuing Calibration Verification

- Area or RT Limit Flag
* - Value Outside Area or RT limits
H - Hour STD - Standard

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Analysis Run Log

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

MSVOA10 -Logbook

Batch: 51985 **Analyst:** Presenta Cabascango

Date: 11-10-2022 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-10-2022 12:54 pm	1.00	50 mL	50 mL	X111001.D	Liquid	Y	NA
2	VSTD000.25	ICAL1	11-10-2022 01:14 pm	1.00	50 mL	50 mL	X111002.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	11-10-2022 01:34 pm	1.00	50 mL	50 mL	X111003.D	Liquid	Y	NA
4	VSTD001	ICAL3	11-10-2022 02:15 pm	1.00	50 mL	50 mL	X111004.D	Liquid	Y	NA
5	VSTD002	ICAL4	11-10-2022 02:35 pm	1.00	50 mL	50 mL	X111005.D	Liquid	Y	NA
6	VSTD005	ICAL5	11-10-2022 02:56 pm	1.00	50 mL	50 mL	X111006.D	Liquid	Y	NA
7	VSTD020	ICAL6	11-10-2022 03:16 pm	1.00	50 mL	50 mL	X111007.D	Liquid	Y	NA
8	VSTD050	ICAL7	11-10-2022 03:37 pm	1.00	50 mL	50 mL	X111008.D	Liquid	Y	NA
9	VSTD100	ICAL8	11-10-2022 03:57 pm	1.00	50 mL	50 mL	X111009.D	Liquid	Y	NA
10	VSTD150	ICAL9	11-10-2022 04:17 pm	1.00	50 mL	50 mL	X111010.D	Liquid	Y	NA
11	VSTD200	ICAL	11-10-2022 04:38 pm	1.00	50 mL	50 mL	X111011.D	Liquid	Y	NA
12	BLANK	SAMP	11-10-2022 04:58 pm	1.00	50 mL	50 mL	X111012.D	Liquid	Y	NA
13	BLANK	SAMP	11-10-2022 05:18 pm	1.00	50 mL	50 mL	X111013.D	Liquid	Y	NA
14	VSTD050	CCV	11-10-2022 05:39 pm	1.00	50 mL	50 mL	X111014.D	Liquid	Y	NA
15	BFB	TUNE	11-10-2022 05:59 pm	1.00	50 mL	50 mL	Z111001.D	Liquid	Y	NA
16	VSTD050	CCV	11-10-2022 06:20 pm	1.00	50 mL	50 mL	Z111002.D	Liquid	Y	NA
17	BLANK	SAMP	11-10-2022 06:40 pm	1.00	50 mL	50 mL	Z111003.D	Liquid	Y	NA
18	CCB	SAMP	11-10-2022 07:00 pm	1.00	50 mL	50 mL	Z111004.D	Liquid	Y	NA
19	VLCSW-221110	LCS	11-10-2022 07:21 pm	1.00	50 mL	50 mL	Z111005.D	Liquid	Y	NA
20	BLANK	SAMP	11-10-2022 07:41 pm	1.00	50 mL	50 mL	Z111006.D	Liquid	Y	NA
21	VBLKW-221110	MBLK	11-10-2022 08:02 pm	1.00	50 mL	50 mL	Z111007.D	Liquid	Y	NA
22	HS22110430-17	SAMP	11-10-2022 08:22 pm	1.00	50 mL	50 mL	Z111008.D	Liquid	Y	NA
23	HS22110430-18	SAMP	11-10-2022 08:43 pm	1.00	50 mL	50 mL	Z111009.D	Liquid	Y	NA
24	HS22110430-19	SAMP	11-10-2022 09:03 pm	1.00	50 mL	50 mL	Z111010.D	Liquid	Y	NA
25	HS22110430-20	SAMP	11-10-2022 09:24 pm	1.00	50 mL	50 mL	Z111011.D	Liquid	Y	NA
26	HS22110430-22	SAMP	11-10-2022 09:44 pm	1.00	50 mL	50 mL	Z111012.D	Liquid	Y	NA
27	HS22110430-23	SAMP	11-10-2022 10:05 pm	1.00	50 mL	50 mL	Z111013.D	Liquid	Y	NA
28	HS22110430-50	SAMP	11-10-2022 10:25 pm	1.00	50 mL	50 mL	Z111014.D	Liquid	Y	NA
29	HS22110430-34	SAMP	11-10-2022 10:46 pm	1.00	50 mL	50 mL	Z111015.D	Liquid	Y	NA
30	HS22110430-40	SAMP	11-10-2022 11:06 pm	1.00	50 mL	50 mL	Z111016.D	Liquid	Y	NA
31	HS22110430-42	SAMP	11-10-2022 11:27 pm	1.00	50 mL	50 mL	Z111017.D	Liquid	Y	NA
32	HS22110430-49	SAMP	11-10-2022 11:47 pm	1.00	50 mL	50 mL	Z111018.D	Liquid	Y	NA
33	HS22110430-35	SAMP	11-11-2022 12:08 am	5.00	10 mL	50 mL	Z111019.D	Liquid	Y	NA
34	HS22110430-35	SAMP	11-11-2022 12:28 am	25.00	2 mL	50 mL	Z111020.D	Liquid	Y	NA
35	HS22110430-35MS	MS	11-11-2022 12:49 am	25.00	2 mL	50 mL	Z111021.D	Liquid	Y	NA
36	HS22110430-35MSD	MSD	11-11-2022 01:09 am	25.00	2 mL	50 mL	Z111022.D	Liquid	Y	NA
37	BLANK	SAMP	11-11-2022 01:30 am	1.00	50 mL	50 mL	Z111023.D	Liquid	Y	NA
38	HS22110430-43	SAMP	11-11-2022 01:50 am	5.00	10 mL	50 mL	Z111024.D	Liquid	Y	NA
39	HS22110430-43n/r	SAMP	11-11-2022 02:11 am	25.00	2 mL	50 mL	Z111025.D	Liquid	Y	NA
40	HS22110430-47	SAMP	11-11-2022 02:31 am	5.00	10 mL	50 mL	Z111026.D	Liquid	Y	NA
41	HS22110430-47n/r	SAMP	11-11-2022 02:51 am	50.00	1 mL	50 mL	Z111027.D	Liquid	Y	NA

MSVOA10 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
42	HS22110430-45	SAMP	11-11-2022 03:12 am	5.00	10 mL	50 mL	Z111028.D	Liquid	Y	NA
43	HS22110430-46	SAMP	11-11-2022 03:32 am	5.00	10 mL	50 mL	Z111029.D	Liquid	Y	NA
44	HS22110430-44	SAMP	11-11-2022 03:53 am	5.00	10 mL	50 mL	Z111030.D	Liquid	Y	NA
45	VSTD050-END	CCV	11-11-2022 04:13 am	1.00	50 mL	50 mL	Z111031.D	Liquid	Y	NA
46	BLANK	SAMP	11-11-2022 10:04 am	1.00	50 mL	50 mL	Z111035.D	Liquid	Y	NA

Form 13 - Analysis Run Log

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

RUNID
VOA10_421680

Volatiles by by EPA 8260

Run ID VOA10_421680 **Start Date** 11/13/22 **EndDate** 11/13/22 **Matrix** Aqueous

Client Sample ID	Type	Lab Sample ID	File ID	Analysis Date	DF
VSTD050	CCV	VSTD050	V111303.D	11/13/22 11:55	1
CCB	CCB	CCB	V111304.D	11/13/22 12:16	1
VLCSW-221113	LCS	VLCSW-221113	V111305.D	11/13/22 12:36	1
VBLKW-221113	MBLK	VBLKW-221113	V111307.D	11/13/22 13:17	1
BatchQC	MS	HS22110430-06MS	V111309.D	11/13/22 13:58	5
BatchQC	MSD	HS22110430-06MSD	V111310.D	11/13/22 14:18	5
Trip Blank-221108	SAMP	HS22110553-14	V111315.D	11/13/22 16:01	1
67WW14-221107	SAMP	HS22110553-01	V111317.D	11/13/22 16:42	1
67WW05-221107	SAMP	HS22110553-02	V111318.D	11/13/22 17:02	1
67WW18-221107	SAMP	HS22110553-03	V111319.D	11/13/22 17:23	1
67WW17-221107	SAMP	HS22110553-04	V111320.D	11/13/22 17:43	1
67WW09-221108	SAMP	HS22110553-07	V111321.D	11/13/22 18:04	1
67WW11-221108	SAMP	HS22110553-08	V111322.D	11/13/22 18:24	1
67WW16I-221108	SAMP	HS22110553-09	V111323.D	11/13/22 18:45	1
67WW16I-221108-FD	SAMP	HS22110553-10	V111324.D	11/13/22 19:05	1
67WW01-221108	SAMP	HS22110553-11	V111325.D	11/13/22 19:26	1
67WW07-221108	SAMP	HS22110553-13	V111326.D	11/13/22 19:46	1
67WW02-221107	SAMP	HS22110553-05	V111327.D	11/13/22 20:07	1
67WW12-221108	SAMP	HS22110553-12	V111328.D	11/13/22 20:27	1
67WW15-221108	SAMP	HS22110553-06	V111329.D	11/13/22 20:47	1

Form 13 - Analysis Run Log

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110553

Volatiles by by EPA 8260

RUNID
VOA10_421783

Run ID VOA10_421783 **Start Date** 11/14/22 **EndDate** 11/14/22 **Matrix** Aqueous

Client Sample ID	Type	Lab Sample ID	File ID	Analysis Date	DF
VSTD050	CCV	VSTD050	V111403.D	11/14/22 11:20	1
CCB	CCB	CCB	V111404.D	11/14/22 11:40	1
VLCSW-221114	LCS	VLCSW-221114	V111405.D	11/14/22 12:08	1
VBLKW-221114	MBLK	VBLKW-221114	V111407.D	11/14/22 12:49	1
67WW15-221108	SAMP	HS22110553-06	V111408.D	11/14/22 13:10	10
67WW15-221108	MS	HS22110553-06MS	V111409.D	11/14/22 13:30	10
67WW15-221108	MSD	HS22110553-06MSD	V111410.D	11/14/22 13:51	10

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Raw Data VOA10 421606

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111001.D Page 1
Report Date: 10-Nov-2022 13:15

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111001.D
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 10-NOV-2022 12:54
Operator : FT Inst ID: voa10.i
Smp Info : BFB;BFB;3;;BFB
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\bfb.m
Meth Date : 27-Sep-2022 15:19 Linh.Pham Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 4.14 Sample Matrix: WATER
Processing Host: NAHSTW7051

Concentration Formula: Amt * DF * Uf * Vf * Vi * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	2.000	Injection Volume
Cpnd Variable		Local Compound Variable

					CONCENTRATIONS ON-COL (ug/L)	FINAL (ug/l)		
RT	EXP RT	REL RT	MASS	RESPONSE			TARGET RANGE	RATIO
1 bfb						CAS #: 460-00-4		
9.276	9.276	(0.000)	95	106224			0.00- 100.00	100.00
9.276	9.276	(0.000)	50	21888			15.00- 40.00	20.61
9.276	9.276	(0.000)	75	49912			30.00- 60.00	46.99
9.276	9.276	(0.000)	96	7146			5.00- 9.00	6.73
9.276	9.276	(0.000)	173	1514			0.00- 2.00	1.60
9.276	9.276	(0.000)	174	94544			50.00- 0.00	89.00
9.276	9.276	(0.000)	175	7622			5.00- 9.00	8.06
9.276	9.276	(0.000)	176	90464			95.00- 101.00	95.68
9.276	9.276	(0.000)	177	7000			5.00- 9.00	7.74

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	20.61
75	30.00 - 60.00% of mass 95	46.99
96	5.00 - 9.00% of mass 95	6.73
173	Less than 2.00% of mass 174	1.43 (1.60)
174	Greater than 50.00% of mass 95	89.00
175	5.00 - 9.00% of mass 174	7.18 (8.06)
176	95.00 - 101.00% of mass 174	85.16 (95.68)
177	5.00 - 9.00% of mass 176	6.59 (7.74)

Data File: X111001.D
Spectrum: Scan 2316 (9.27)
Location of Maximum: 95.10
Number of points: 77

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	1543	62.10	4636	87.00	5382	131.00	357
37.10	8189	63.10	4008	87.90	3783	135.00	254
38.10	6153	64.00	582	90.80	468	140.70	1059
39.10	3296	65.10	378	92.10	2511	142.90	1453
40.00	769	67.20	424	93.10	4442	146.00	152
44.00	1237	68.10	12632	94.10	11379	147.80	247
45.10	1104	69.00	11564	95.10	106224	155.00	420
47.10	1942	69.90	667	96.10	7146	157.20	343
47.90	692	72.10	891	97.10	343	169.50	153
49.10	5234	73.00	5398	104.00	533	171.50	332
50.10	21888	74.10	18304	104.70	220	172.10	405
51.10	7654	75.10	49912	105.80	504	172.90	1514
51.90	334	76.10	5401	110.90	163	174.00	94544
54.80	255	76.90	877	115.50	199	175.00	7622
55.40	348	77.70	315	115.90	286	175.90	90464
56.10	1538	78.20	363	116.80	499	176.90	7000
57.00	3079	79.00	2904	118.10	533	178.10	293
58.30	219	80.20	926	118.90	682		
60.10	1673	80.90	3002	127.80	466		
61.00	4824	82.00	740	130.10	481		

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111001.D Page 1

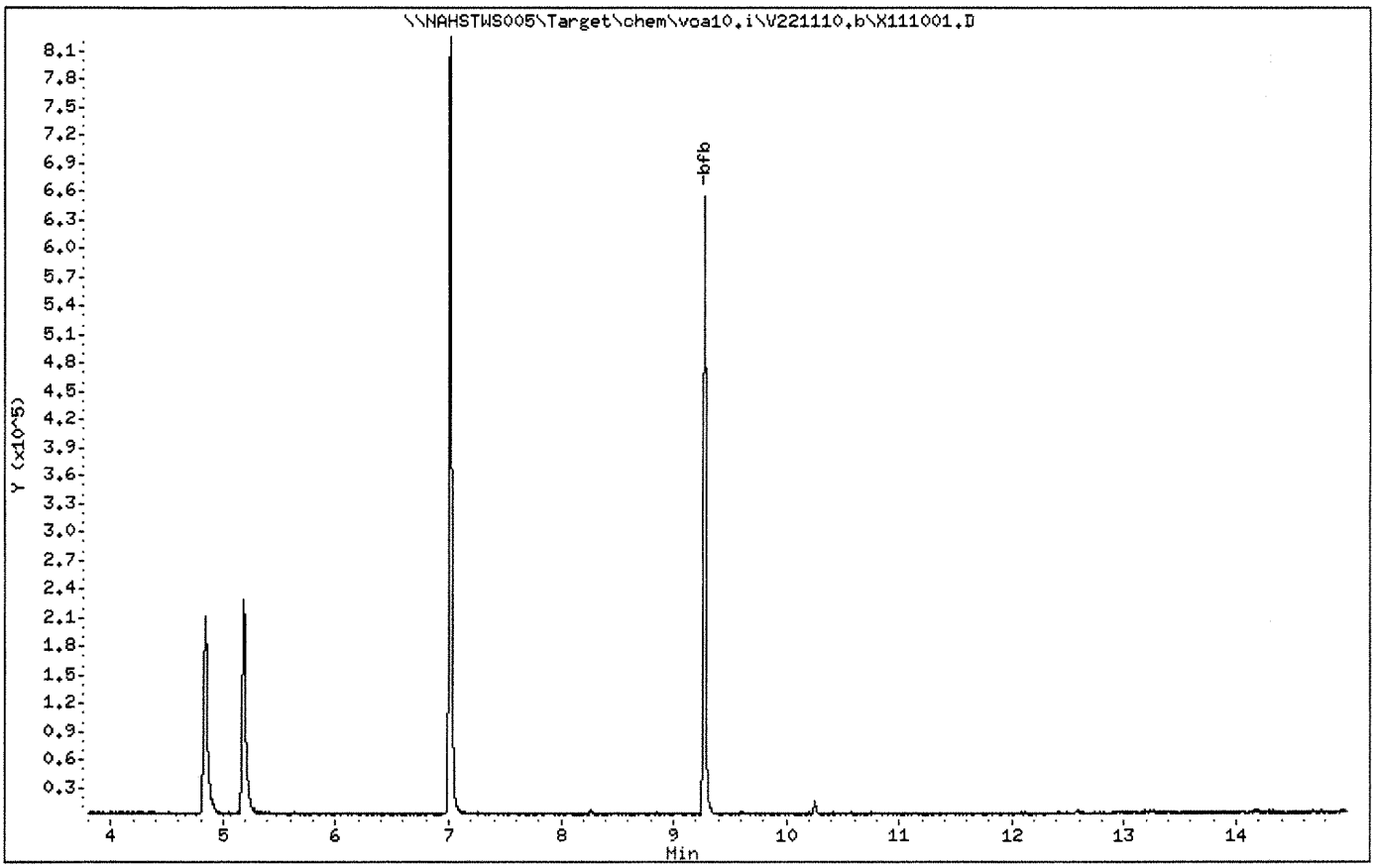
Date : 10-NOV-2022 12:54

Client ID: BFB Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: FT

Column phase: DB624 Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111001.D Page 2

Date : 10-NOV-2022 12:54

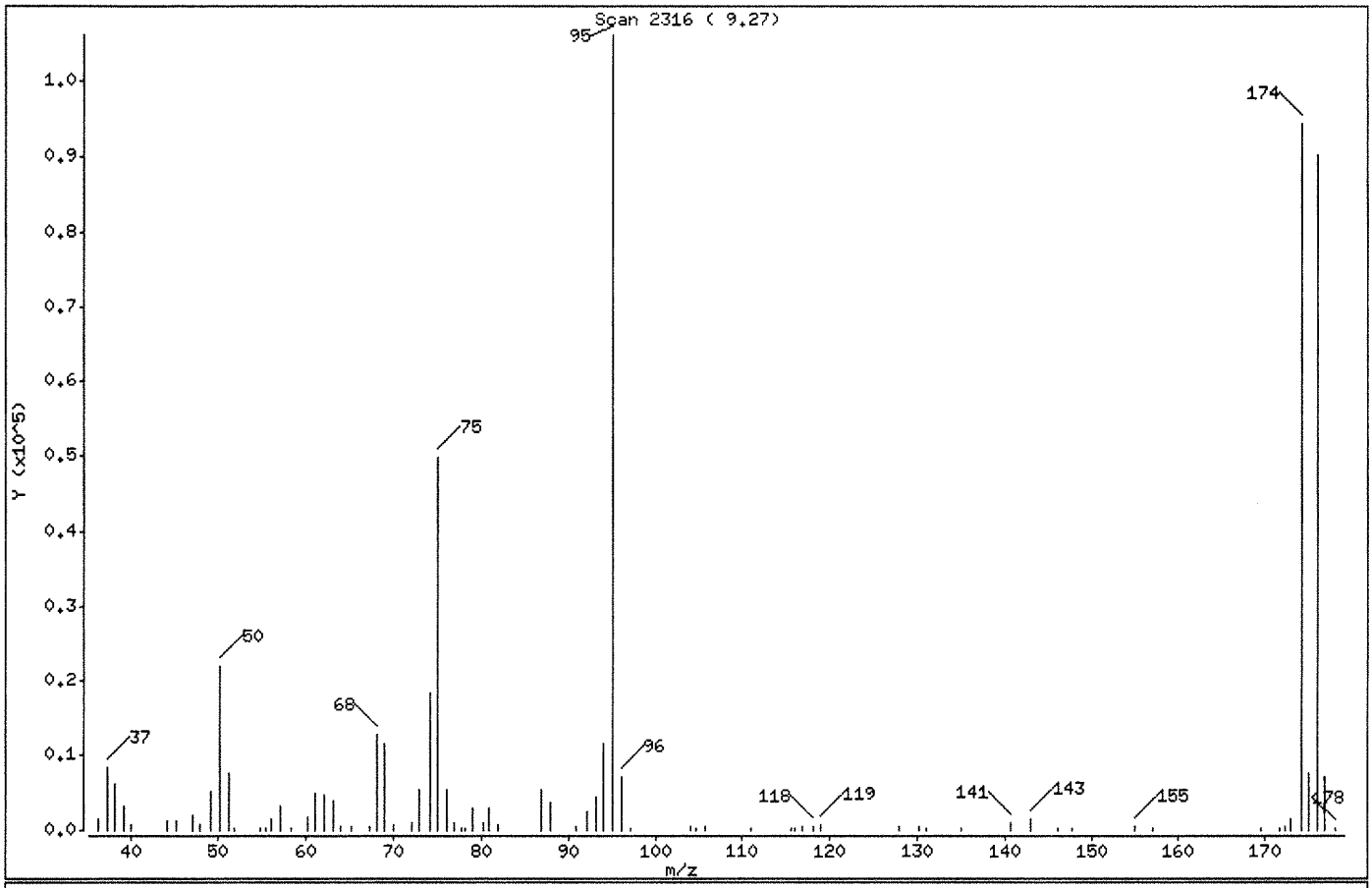
Client ID: BFB Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: FT

Column phase: DB624 Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	20.61
75	30.00 - 60.00% of mass 95	46.99
96	5.00 - 9.00% of mass 95	6.73
173	Less than 2.00% of mass 174	1.43 (1.60)
174	Greater than 50.00% of mass 95	89.00
175	5.00 - 9.00% of mass 174	7.18 (8.06)
176	95.00 - 101.00% of mass 174	85.16 (95.68)
177	5.00 - 9.00% of mass 176	6.59 (7.74)

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111001.D

Date : 10-NOV-2022 12:54

Client ID: BFB Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: FT

Column phase: DB624 Column diameter: 0.25

Data File: X111001.D
Spectrum: Scan 2316 (9.27)
Location of Maximum: 95.10
Number of points: 77

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	1543	62.10	4636	87.00	5382	131.00	357
37.10	8189	63.10	4008	87.90	3783	135.00	254
38.10	6153	64.00	582	90.80	468	140.70	1059
39.10	3296	65.10	378	92.10	2511	142.90	1453
40.00	769	67.20	424	93.10	4442	146.00	152
44.00	1237	68.10	12632	94.10	11379	147.80	247
45.10	1104	69.00	11564	95.10	106224	155.00	420
47.10	1942	69.90	667	96.10	7146	157.20	343
47.90	692	72.10	891	97.10	343	169.50	153
49.10	5234	73.00	5398	104.00	533	171.50	332
50.10	21888	74.10	18304	104.70	220	172.10	405
51.10	7654	75.10	49912	105.80	504	172.90	1514
51.90	334	76.10	5401	110.90	163	174.00	94544
54.80	255	76.90	877	115.50	199	175.00	7622
55.40	348	77.70	315	115.90	286	175.90	90464
56.10	1538	78.20	363	116.80	499	176.90	7000
57.00	3079	79.00	2904	118.10	533	178.10	293
58.30	219	80.20	926	118.90	682		
60.10	1673	80.90	3002	127.80	466		
61.00	4824	82.00	740	130.10	481		

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111002.D Page 1
Report Date: 17-Nov-2022 14:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111002.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 10-NOV-2022 13:14
Operator : FT Inst ID: voa10.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:02 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
*	1 Pentafluorobenzene	168	4.916	4.916	(1.000)	507296	50.0000	
	2 Dichlorodifluoromethane	85	1.227	1.227	(0.250)	684	0.25000	0.15
	3 Chloromethane	50	1.374	1.374	(0.279)	1057	0.25000	0.22
	5 Vinyl Chloride	62	1.449	1.449	(0.295)	854	0.25000	0.18
	6 Bromomethane	94	1.707	1.707	(0.347)	621	0.25000	0.29
	8 Trichlorofluoromethane	101	1.992	1.992	(0.405)	742	0.25000	0.11
	10 Acetone	43	2.491	2.491	(0.507)	4401	0.50000	
	12 Isobutyl Alcohol	43	5.385	5.385	(1.095)	3348	5.00000	4.23(T)
	13 Acetonitrile	39	2.779	2.779	(0.565)	2386	2.50000	3.36
	17 Methylene Chloride	84	2.888	2.888	(0.588)	1800	0.25000	(M)
	18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	1633	0.25000	0.12
	19 Carbon Disulfide	76	2.637	2.637	(0.536)	5199	0.50000	(M)
	20 trans-1,2-Dichloroethene	96	3.169	3.169	(0.645)	1013	0.25000	0.26(T)
	22 1,1-Dichloroethane	63	3.615	3.615	(0.735)	2152	0.25000	(M)
	27 cis-1,2-Dichloroethene	96	4.313	4.313	(0.877)	1490	0.25000	0.32(M)
	28 Chloroform	83	4.665	4.665	(0.949)	2018	0.25000	0.24
	29 Bromochloromethane	128	4.571	4.571	(0.930)	733	0.25000	0.31(M)
$	30 Dibromofluoromethane	113	4.837	4.837	(0.984)	1427	0.25000	0.33
	31 1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	1582	0.25000	0.23(M)
	32 1,1-Dichloropropene	75	5.043	5.043	(0.894)	973	0.25000	0.16

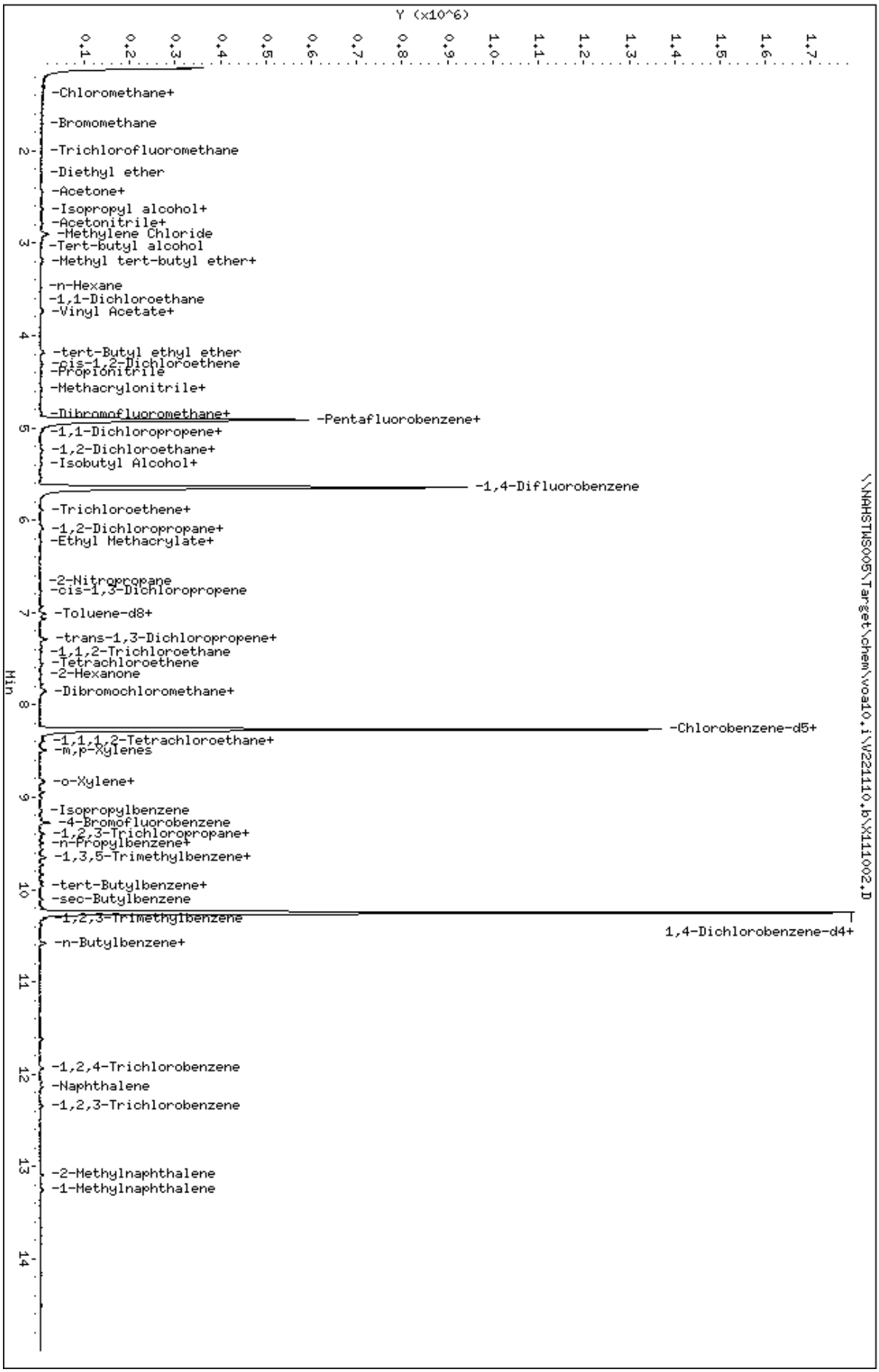
33 1,2-Dichloroethane	62	5.257	5.257 (0.932)	1860	0.25000	0.25
34 Carbon Tetrachloride	117	5.025	5.025 (0.890)	1328	0.25000	0.25(M)

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111002.D Page 2
Report Date: 17-Nov-2022 14:02

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
$	35 1,2-Dichloroethane-d4	65	5.190	5.190	(1.056)	2111	0.25000	0.38(T)
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	784031	50.0000	
	37 Benzene	78	5.238	5.238	(0.928)	4686	0.25000	0.23
	38 Trichloroethene	130	5.883	5.883	(1.043)	848	0.25000	0.16
	42 1,2-Dichloropropane	63	6.101	6.101	(1.081)	1548	0.25000	0.27
	46 cis-1,3-Dichloropropene	75	6.775	6.775	(1.201)	1853	0.25000	0.22
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	691971	50.0000	
$	48 Toluene-d8	98	7.012	7.012	(0.848)	7104	0.25000	0.68(T)
	50 Toluene	91	7.064	7.064	(0.854)	4541	0.25000	0.22
	51 trans-1,3-Dichloropropene	75	7.266	7.266	(1.288)	1586	0.25000	0.21
	52 2-Hexanone	43	7.664	7.664	(0.927)	2678	0.50000	2.30
	53 1,1,2-Trichloroethane	83	7.424	7.424	(0.898)	1132	0.25000	0.27
	55 Dibromochloromethane	129	7.765	7.765	(0.939)	987	0.25000	0.18
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	1284	0.25000	0.30
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	1175	0.25000	0.23
	59 Chlorobenzene	112	8.294	8.294	(1.003)	3344	0.25000	0.24
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	817	0.25000	0.16
	61 Ethylbenzene	106	8.391	8.391	(1.015)	1642	0.25000	0.24
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	3525	0.50000	0.41
	63 o-Xylene	106	8.830	8.830	(1.068)	1725	0.25000	0.20
	64 Styrene	104	8.841	8.841	(1.069)	2551	0.25000	0.16
	67 Isopropylbenzene	105	9.152	9.152	(1.107)	3811	0.25000	0.18
	68 1,1,2,2-Tetrachloroethane	83	9.392	9.392	(0.916)	2053	0.25000	0.11(M)
$	69 4-Bromofluorobenzene	95	9.276	9.276	(1.122)	5368	0.25000	1.70
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	435268	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.643	9.643	(0.941)	3383	0.25000	0.19
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	2681	0.25000	0.17
	79 1,2,4-Trimethylbenzene	105	9.954	9.954	(0.971)	3315	0.25000	0.17
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	3697	0.25000	0.17
	87 n-Butylbenzene	91	10.573	10.573	(1.031)	3186	0.25000	0.16
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	4565	0.25000	0.19
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	2294	0.25000	0.24
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	2751	0.25000	0.20
	84 1,4-Dichlorobenzene	146	10.265	10.265	(1.001)	3585	0.25000	0.85
	88 1,2-Dichlorobenzene	146	10.588	10.588	(1.033)	2738	0.25000	0.21
	90 1,2,4-Trichlorobenzene	180	11.933	11.933	(1.164)	2510	0.25000	0.31(M)
	92 Naphthalene	128	12.143	12.143	(1.185)	5418	0.25000	0.22
	136 n-Hexane	57	3.473	3.473	(0.706)	685	0.25000	0.12(T)
	147 Methylcyclohexane	55	6.071	6.071	(1.076)	813	0.25000	0.11
	141 Cyclohexane	56	4.901	4.901	(0.997)	1525	0.25000	(M)
	138 Freon TF	101	2.449	2.449	(0.498)	528	0.25000	(M)
	21 Vinyl Acetate	43	3.709	3.709	(0.754)	4935	0.50000	0.47(M)
	74 Bromobenzene	156	9.403	9.403	(0.917)	1689	0.25000	0.25
	76 2-Chlorotoluene	91	9.564	9.564	(0.933)	3035	0.25000	1.59
	77 4-Chlorotoluene	91	9.654	9.654	(0.942)	4152	0.25000	0.22
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	3824	0.25000	0.19
	93 1,2,3-Trichlorobenzene	180	12.342	12.342	(1.204)	2350	0.25000	0.01
	148 tert-Butyl Alcohol	59	3.042	3.042	(0.619)	1924	5.00000	3.02
M	94 1,2-Dichloroethylene (total)	96				2503	0.50000	
M	95 Xylenes (total)	106				5250	0.75000	

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.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1.6
1.7
Min
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11
12
13
14
-Chloromethane+
-Bromomethane
-Trichlorofluoromethane
-Diethyl ether
-Acetone+
-Isopropyl alcohol+
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Methyl tert-butyl ether+
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-Vinyl Acetate+
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-cis-1,2-Dichloroethene
-Propionitrile
-Methacrylonitrile+
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
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Instrument: voa10,i
Operator: FT
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Page 1

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Inj Date : 10-NOV-2022 13:14
InstruID : voa10.i
LabSampID : VSTD000.25

Methylene Chloride (75-09-2)

Reason Code:

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17-Nov-2022
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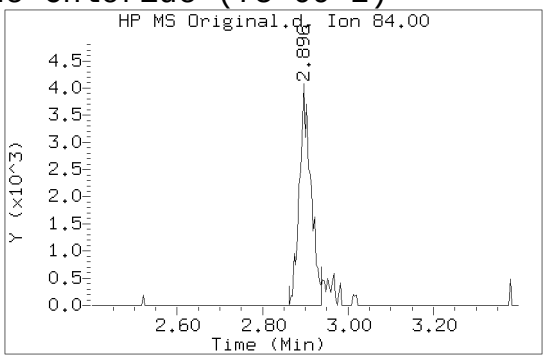

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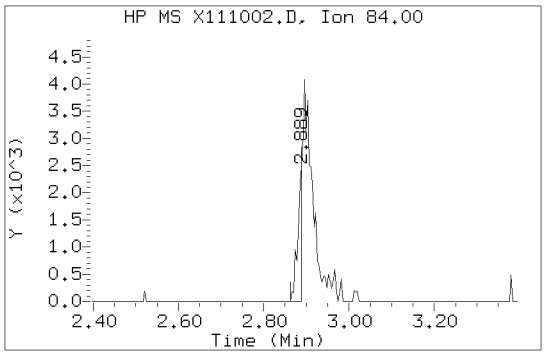

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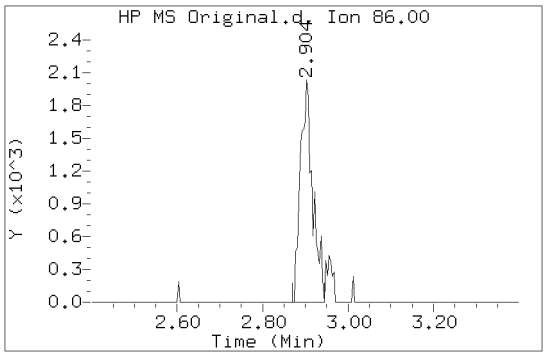

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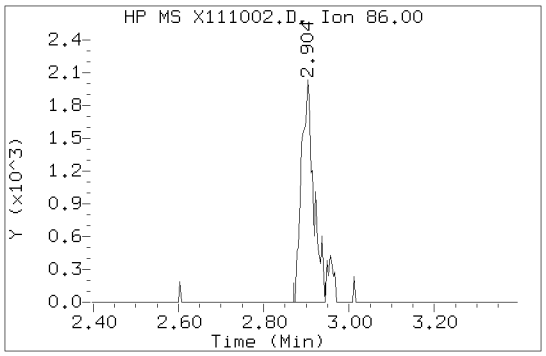

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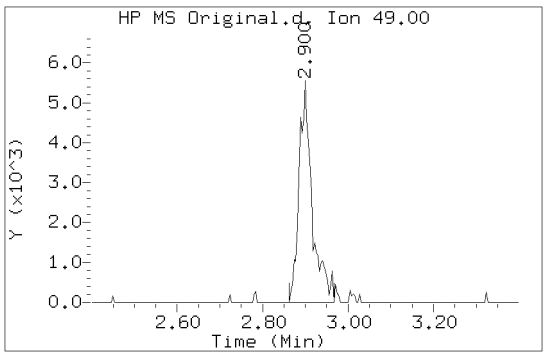

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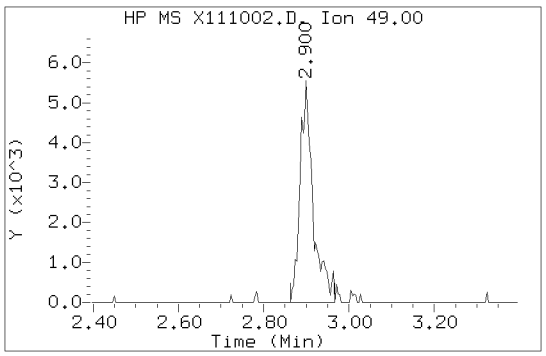

Carbon Disulfide (75-15-0)

Reason Code:

BEFORE

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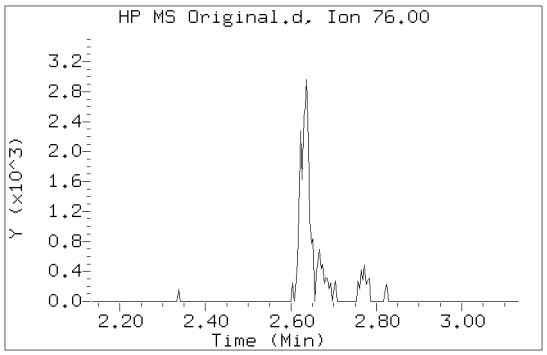

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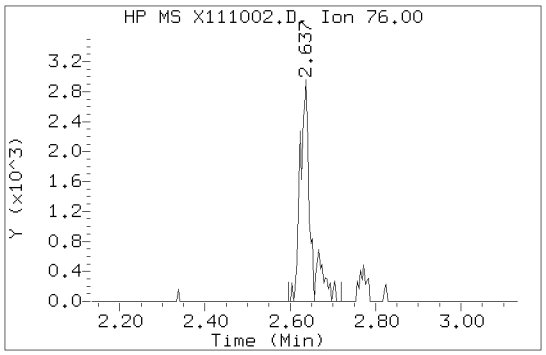

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InstruID : voa10.i
LabSampID : VSTD000.25

Carbon Disulfide (75-15-0)

Reason Code:

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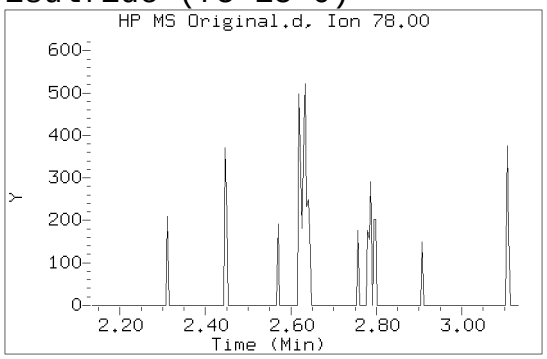

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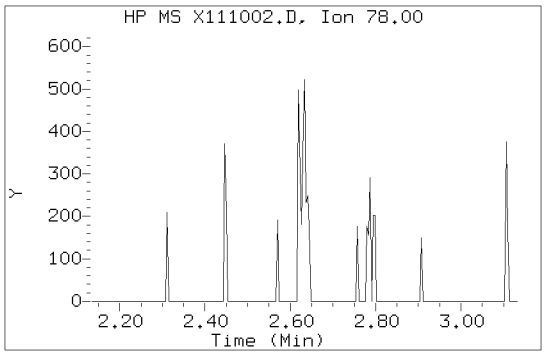

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Reason Code:

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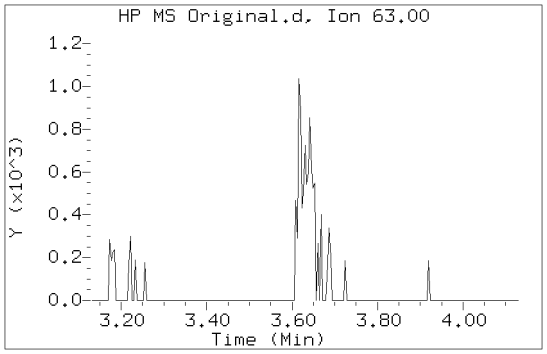

AFTER

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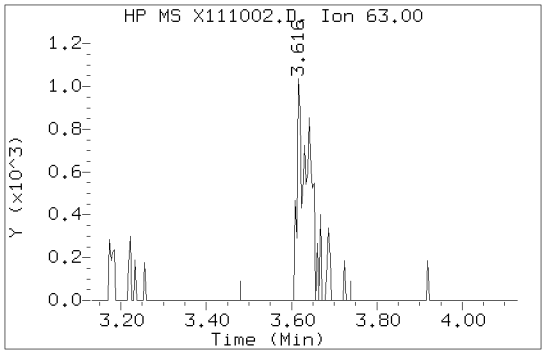

BEFORE

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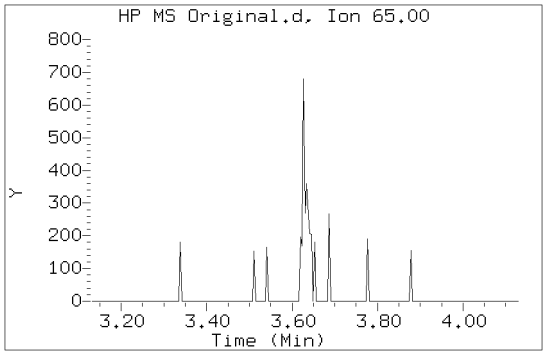

AFTER

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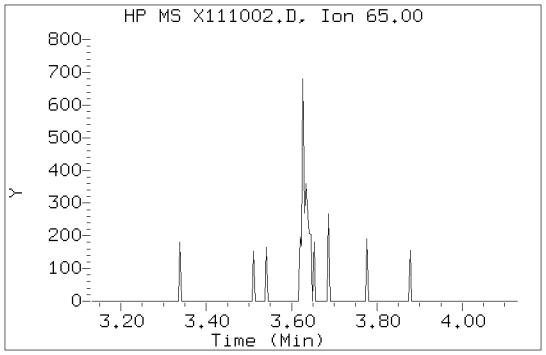

BEFORE

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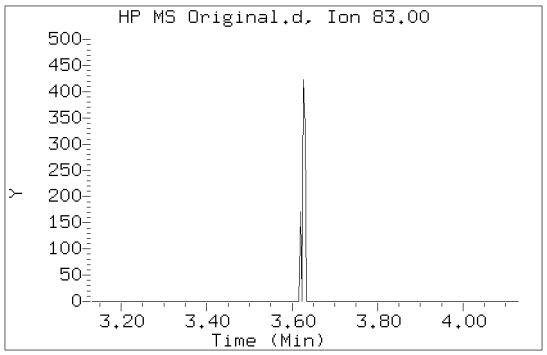

AFTER

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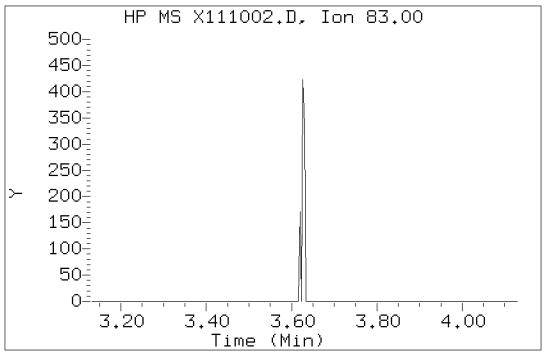

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InstruID : voa10.i
LabSampID : VSTD000.25

cis-1,2-Dichloroethene (156-59-2)

Reason Code:

BEFORE

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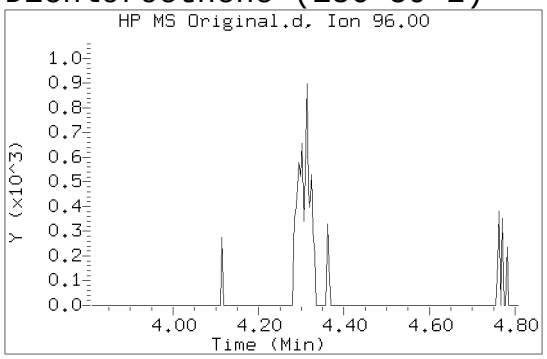

AFTER

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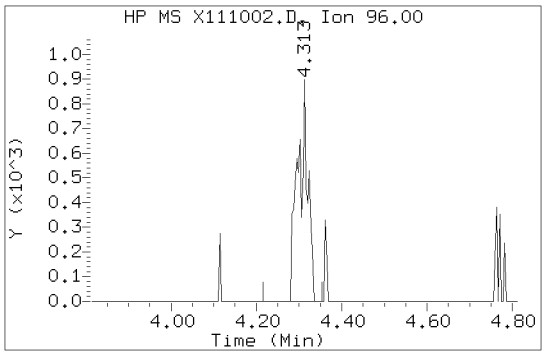

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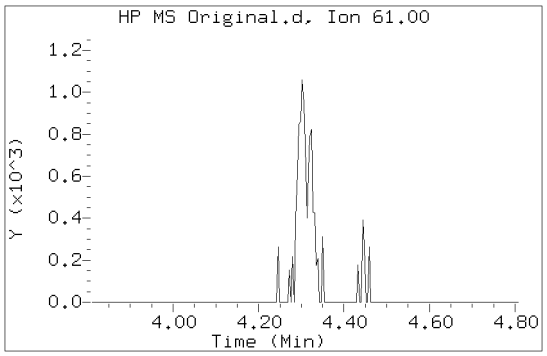

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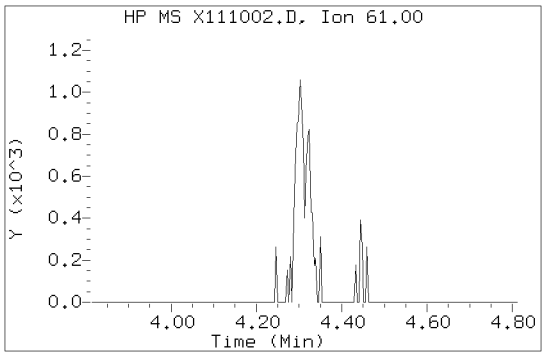

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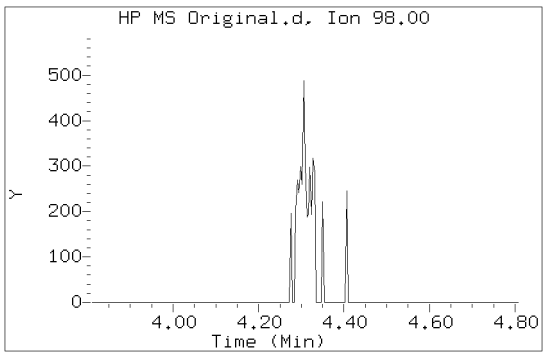

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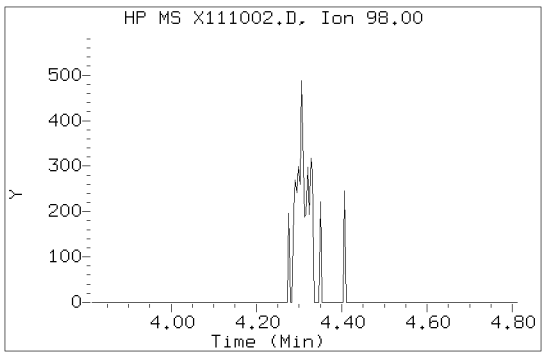
17-Nov-2022
14:02
linh
pham

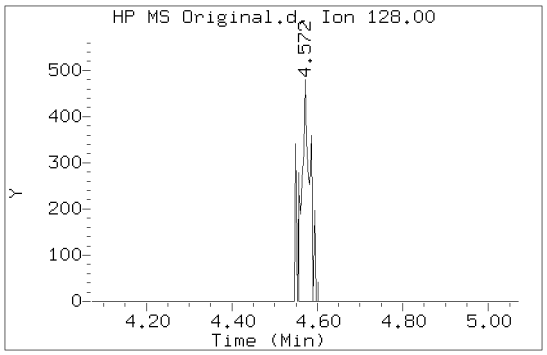


Bromochloromethane (74-97-5)

Reason Code:

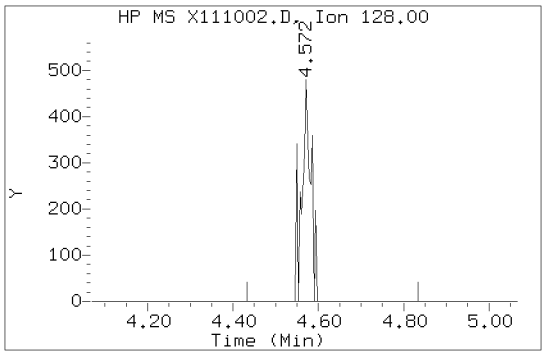
BEFORE

MASS
128
AREA
656
HEIGHT
480
17-Nov-2022
13:58
linh
pham



AFTER

MASS
128
AREA
733
HEIGHT
480
17-Nov-2022
14:02
linh
pham

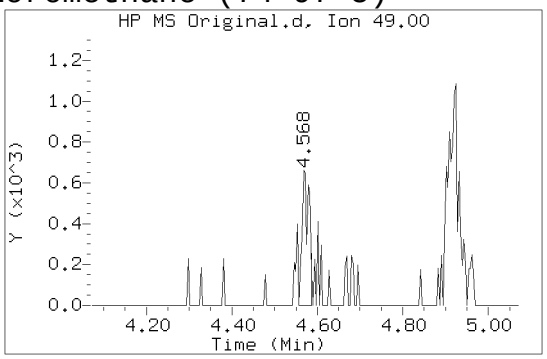


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111002.D
Inj Date : 10-NOV-2022 13:14
InstruID : voa10.i
LabSampID : VSTD000.25

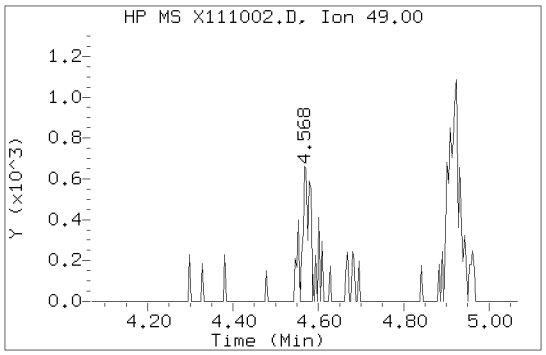
Bromochloromethane (74-97-5)

Reason Code:

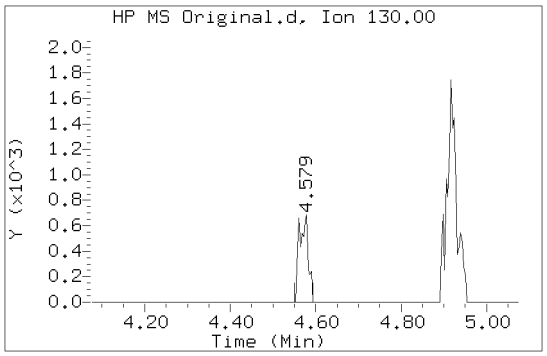
BEFORE
MASS
49
AREA
783
HEIGHT
664
17-Nov-2022
13:58
linh
pham



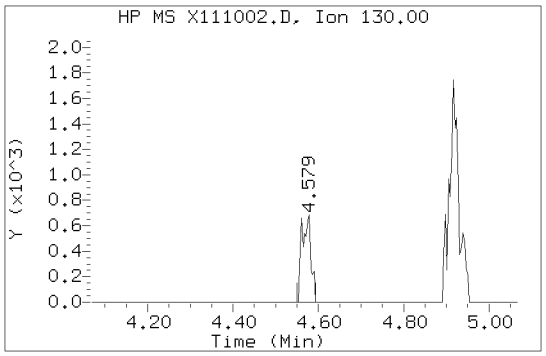
AFTER
MASS
49
AREA
783
HEIGHT
664
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
130
AREA
1035
HEIGHT
687
17-Nov-2022
13:58
linh
pham



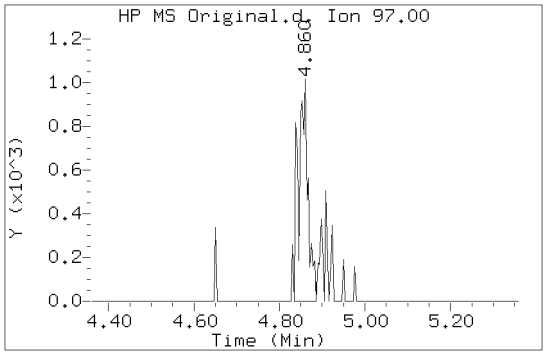
AFTER
MASS
130
AREA
1035
HEIGHT
687
17-Nov-2022
14:02
linh
pham



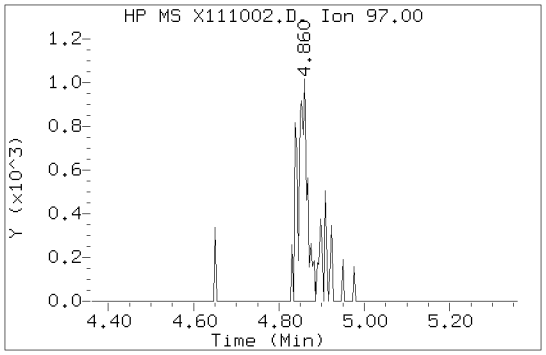
1,1,1-Trichloroethane (71-55-6)

Reason Code:

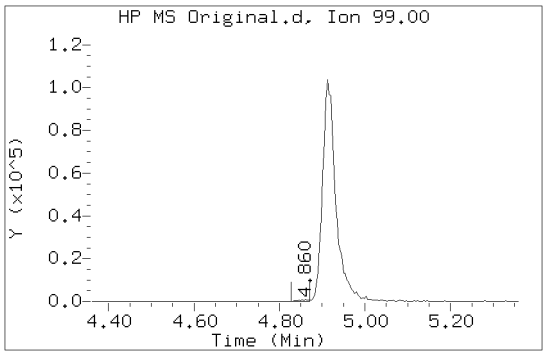
BEFORE
MASS
97
AREA
1582
HEIGHT
1017
17-Nov-2022
13:58
linh
pham



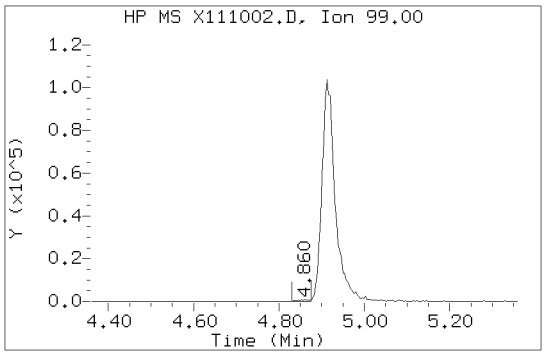
AFTER
MASS
97
AREA
1582
HEIGHT
1017
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
99
AREA
1292
HEIGHT
980
17-Nov-2022
13:58
linh
pham



AFTER
MASS
99
AREA
1404
HEIGHT
980
17-Nov-2022
14:02
linh
pham



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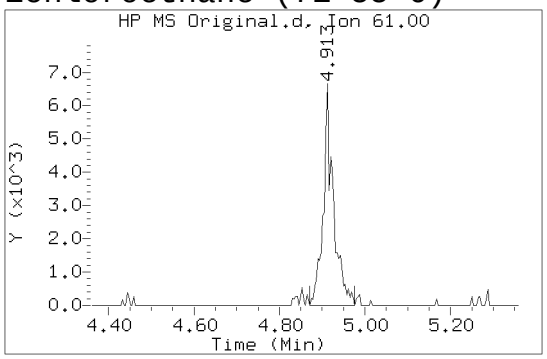
Inj Date : 10-NOV-2022 13:14
InstruID : voa10.i
LabSampID : VSTD000.25

1,1,1-Trichloroethane (71-55-6)

Reason Code:

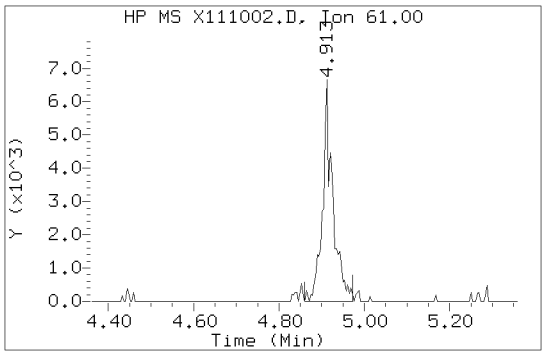
BEFORE

MASS
61
AREA
10883
HEIGHT
6661
17-Nov-2022
13:58
linh
pham



AFTER

MASS
61
AREA
10996
HEIGHT
6661
17-Nov-2022
14:02
linh
pham

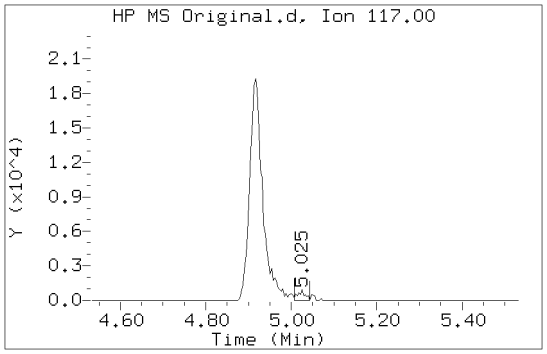


Carbon Tetrachloride (56-23-5)

Reason Code:

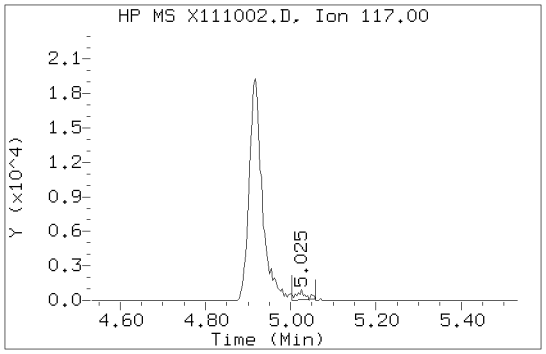
BEFORE

MASS
117
AREA
1102
HEIGHT
944
17-Nov-2022
13:58
linh
pham



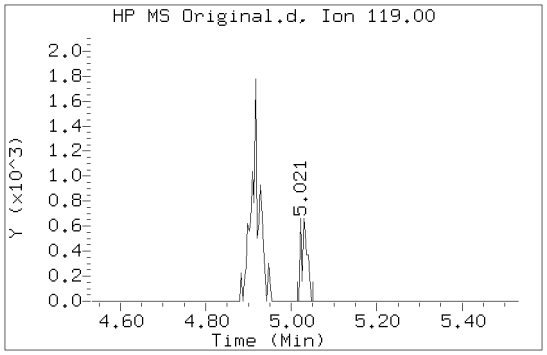
AFTER

MASS
117
AREA
1328
HEIGHT
896
17-Nov-2022
14:02
linh
pham



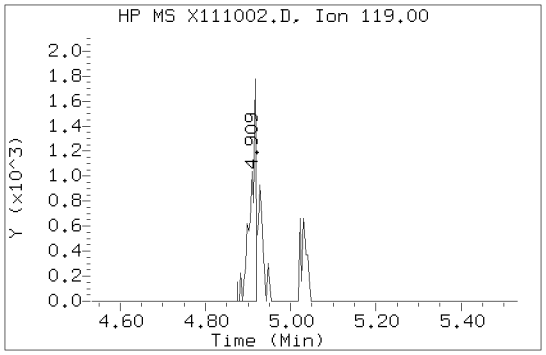
BEFORE

MASS
119
AREA
664
HEIGHT
663
17-Nov-2022
13:58
linh
pham



AFTER

MASS
119
AREA
1480
HEIGHT
1040
17-Nov-2022
14:02
linh
pham

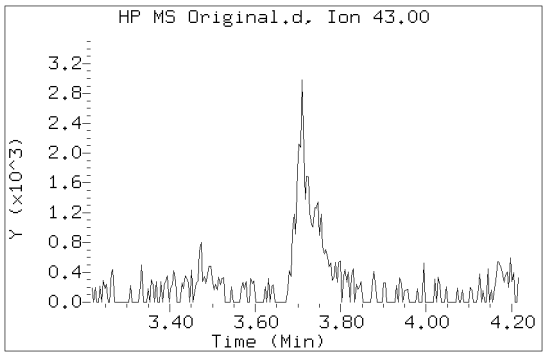


Vinyl Acetate (108-05-4)

Reason Code:

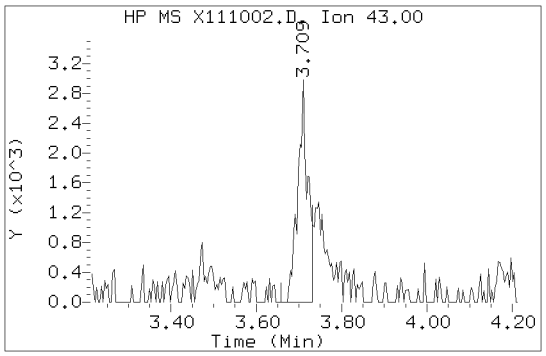
BEFORE

MASS
43
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
43
AREA
4935
HEIGHT
2982
17-Nov-2022
14:02
linh
pham



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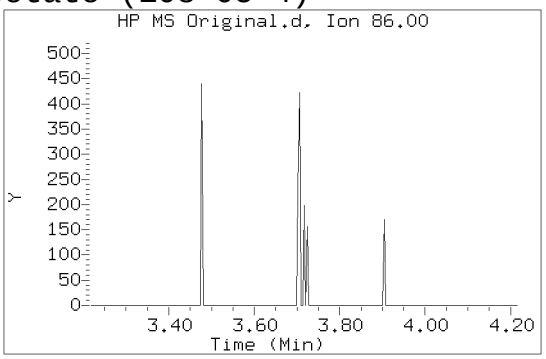
Inj Date : 10-NOV-2022 13:14
InstruID : voa10.i
LabSampID : VSTD000.25

Vinyl Acetate (108-05-4)

Reason Code:

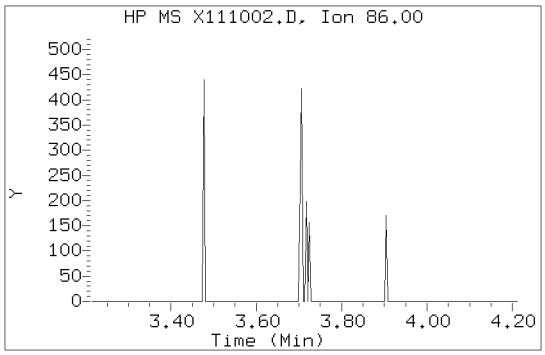
BEFORE

MASS
86
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
86
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

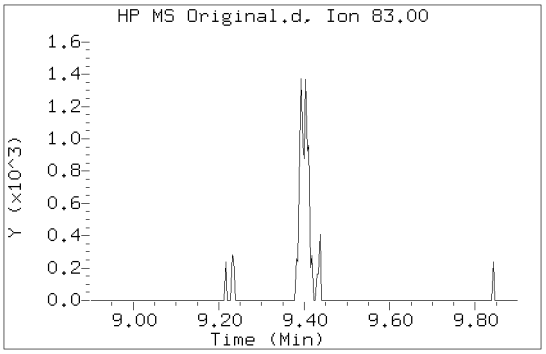


1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

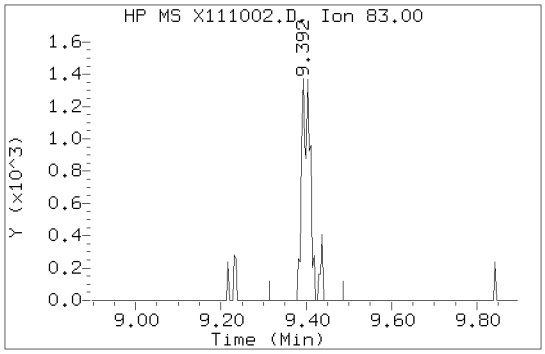
BEFORE

MASS
83
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



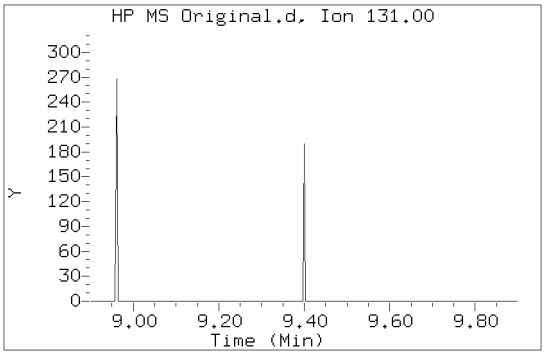
AFTER

MASS
83
AREA
2053
HEIGHT
1372
17-Nov-2022
14:02
linh
pham



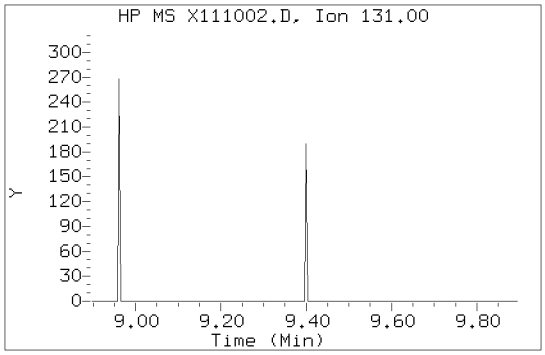
BEFORE

MASS
131
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



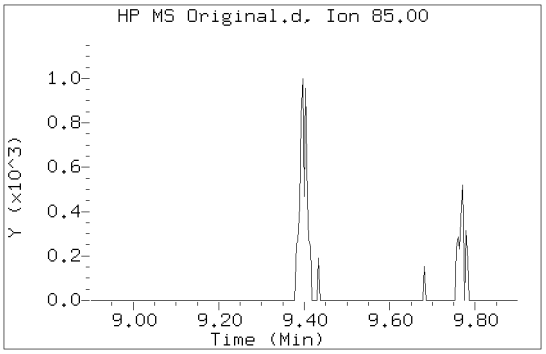
AFTER

MASS
131
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



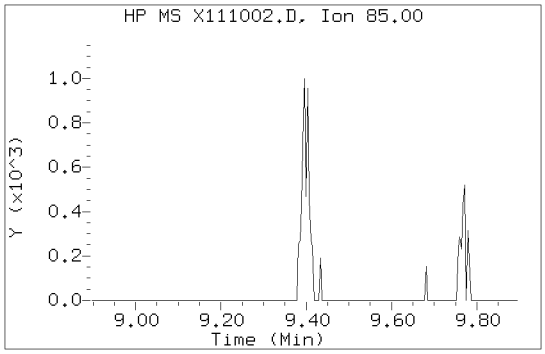
BEFORE

MASS
85
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
85
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



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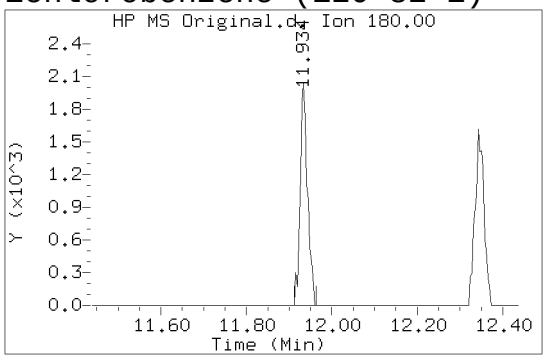
Inj Date : 10-NOV-2022 13:14
InstruID : voa10.i
LabSampID : VSTD000.25

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

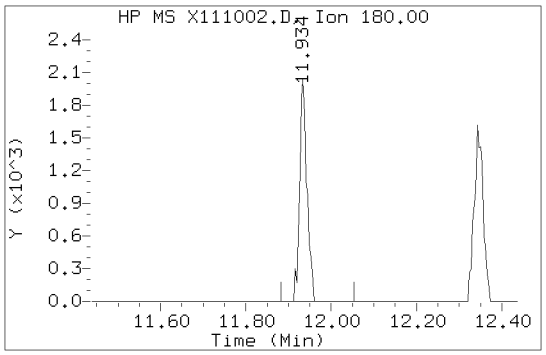
BEFORE

MASS
180
AREA
2510
HEIGHT
2036
17-Nov-2022
13:58
linh
pham



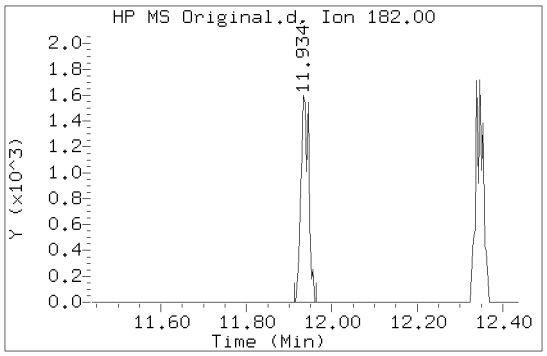
AFTER

MASS
180
AREA
2510
HEIGHT
2036
17-Nov-2022
14:02
linh
pham



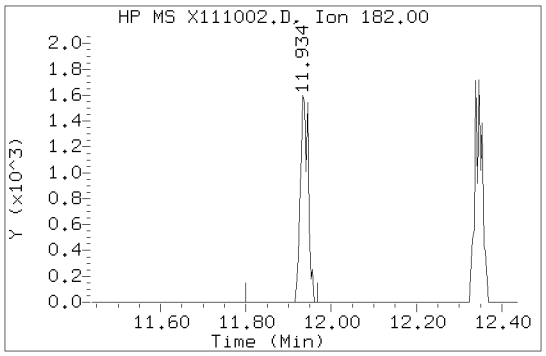
BEFORE

MASS
182
AREA
2089
HEIGHT
1601
17-Nov-2022
13:58
linh
pham



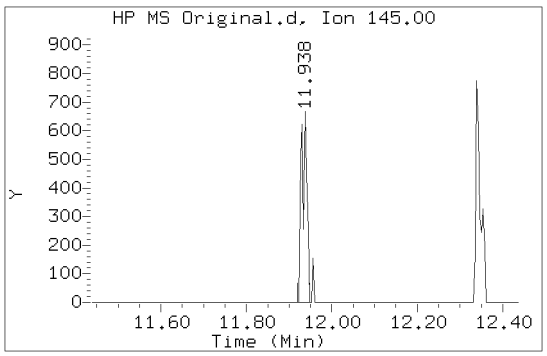
AFTER

MASS
182
AREA
2089
HEIGHT
1601
17-Nov-2022
14:02
linh
pham



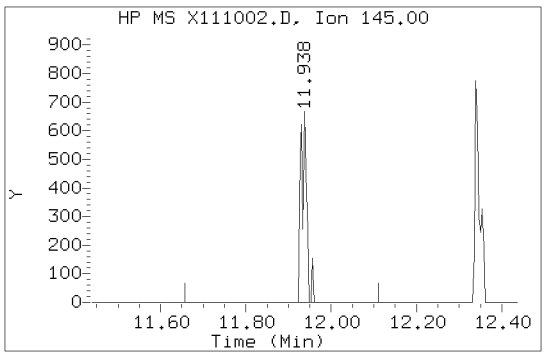
BEFORE

MASS
145
AREA
620
HEIGHT
668
17-Nov-2022
13:58
linh
pham



AFTER

MASS
145
AREA
655
HEIGHT
668
17-Nov-2022
14:02
linh
pham

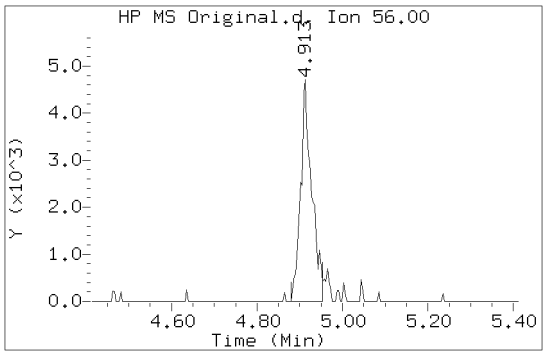


Cyclohexane (110-82-7)

Reason Code:

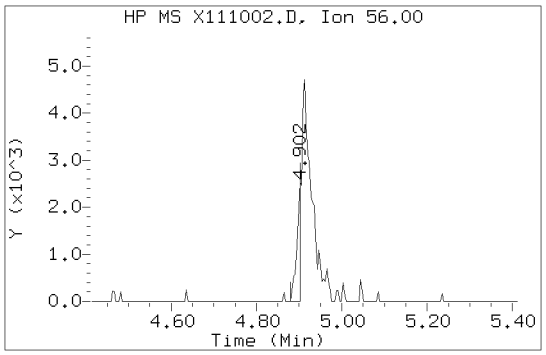
BEFORE

MASS
56
AREA
8753
HEIGHT
4710
17-Nov-2022
13:58
linh
pham



AFTER

MASS
56
AREA
1525
HEIGHT
2534
17-Nov-2022
14:02
linh
pham

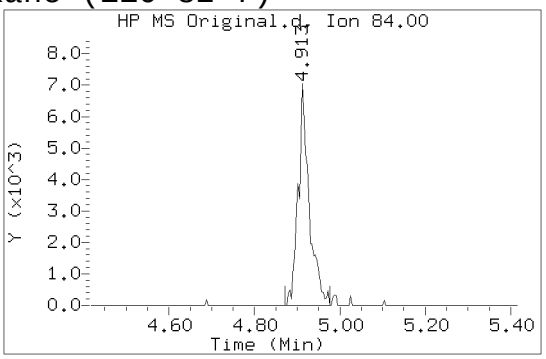


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111002.D
Inj Date : 10-NOV-2022 13:14
InstruID : voa10.i
LabSampID : VSTD000.25

Cyclohexane (110-82-7)

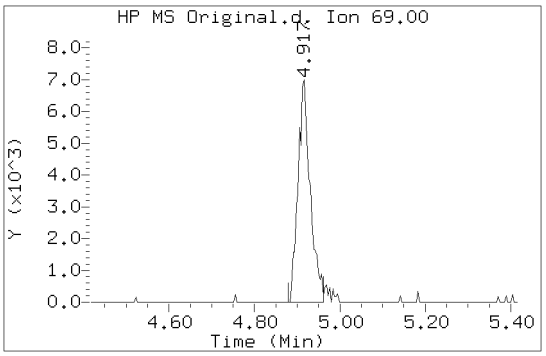
BEFORE

MASS
84
AREA
12907
HEIGHT
7046
17-Nov-2022
13:58
linh
pham



BEFORE

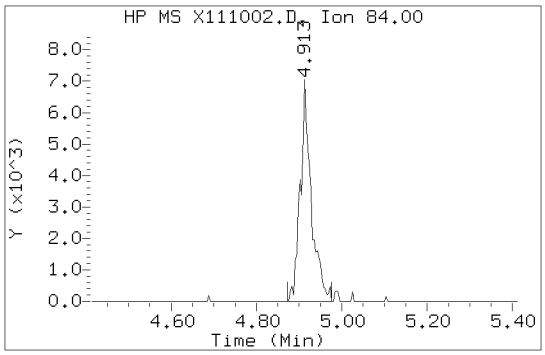
MASS
69
AREA
14098
HEIGHT
6994
17-Nov-2022
13:58
linh
pham



Reason Code:

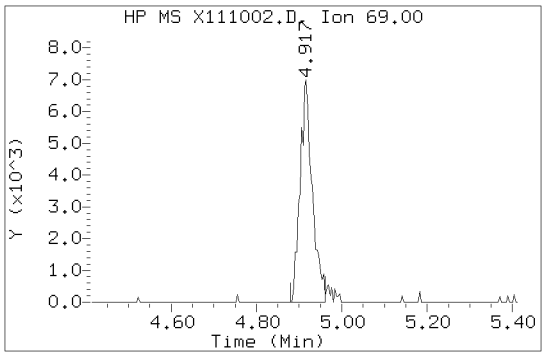
AFTER

MASS
84
AREA
12907
HEIGHT
7046
17-Nov-2022
14:02
linh
pham



AFTER

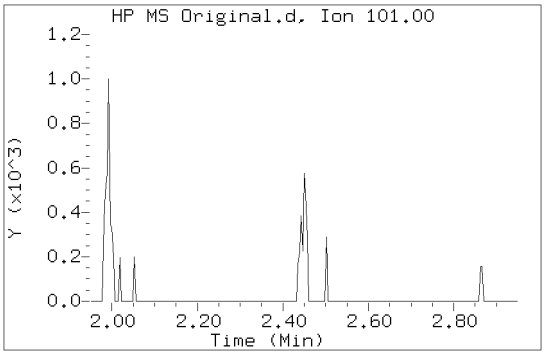
MASS
69
AREA
14098
HEIGHT
6994
17-Nov-2022
14:02
linh
pham



Freon TF (76-13-1)

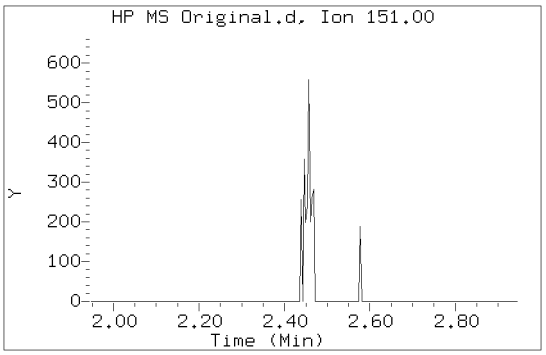
BEFORE

MASS
101
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



BEFORE

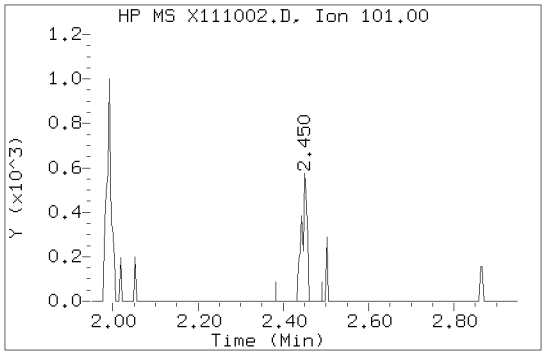
MASS
151
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



Reason Code:

AFTER

MASS
101
AREA
528
HEIGHT
575
17-Nov-2022
14:02
linh
pham



AFTER

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HEIGHT
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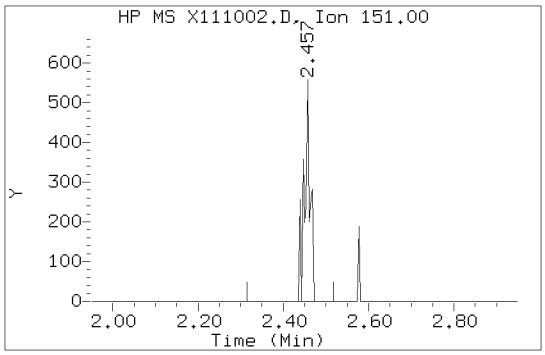
17-Nov-2022
14:02
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D Page 1
Report Date: 17-Nov-2022 14:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Lab Smp Id: VSTD000.5 Client Smp ID: VSTD000.5
Inj Date : 10-NOV-2022 13:34
Operator : FT Inst ID: voa10.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : V10;WATER;0;1;
Comment   :
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Meth Date : 17-Nov-2022 14:02 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 13:14 Cal File: X111002.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	451483	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	1883	0.50000	0.48(M)
3	Chloromethane	50	1.370	1.370	(0.279)	2172	0.50000	0.51(M)
5	Vinyl Chloride	62	1.456	1.456	(0.296)	2101	0.50000	0.50(M)
6	Bromomethane	94	1.704	1.704	(0.347)	933	0.50000	0.49(M)
7	Chloroethane	64	1.782	1.782	(0.363)	1257	0.50000	0.52(M)
8	Trichlorofluoromethane	101	1.992	1.992	(0.405)	3060	0.50000	0.55(M)
9	Acrolein	56	2.337	2.337	(0.475)	183	1.00000	(M)
10	Acetone	43	2.487	2.487	(0.506)	3505	1.00000	(M)
12	Isobutyl Alcohol	43	5.373	5.373	(1.093)	6999	10.0000	9.94
13	Acetonitrile	39	2.776	2.776	(0.565)	3418	5.00000	5.41(M)
16	Acrylonitrile	53	3.151	3.151	(0.641)	1522	1.00000	0.91
11	1,1-Dichloroethene	96	2.446	2.446	(0.498)	1548	0.50000	(M)
15	Iodomethane	142	2.569	2.569	(0.523)	1488	1.00000	4.70(TM)
17	Methylene Chloride	84	2.892	2.892	(0.588)	2905	0.50000	(M)
18	Methyl tert-butyl ether	73	3.199	3.199	(0.651)	4816	0.50000	0.41
19	Carbon Disulfide	76	2.633	2.633	(0.536)	11091	1.00000	0.47
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	1682	0.50000	0.48(M)
22	1,1-Dichloroethane	63	3.627	3.627	(0.738)	2831	0.50000	(M)
24	2-Butanone	43	4.361	4.361	(0.887)	2170	1.00000	0.92(M)

27 cis-1,2-Dichloroethene	96	4.301	4.301 (0.875)	2052	0.50000	0.49(M)
28 Chloroform	83	4.669	4.669 (0.950)	4005	0.50000	0.53(M)

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D Page 2
Report Date: 17-Nov-2022 14:02

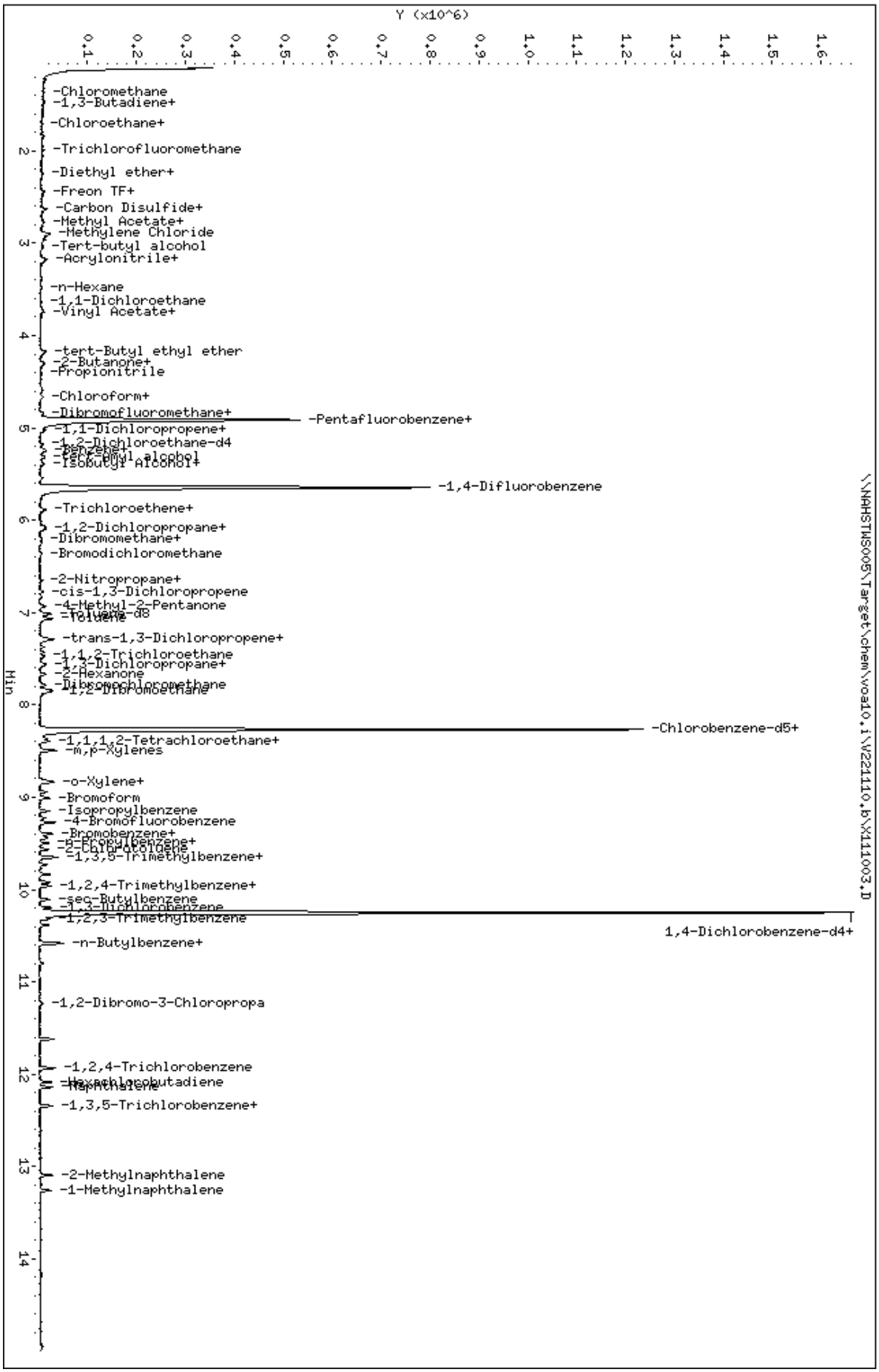
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.564	4.564	(0.928)	958	0.50000	0.46(M)
$	30 Dibromofluoromethane	113	4.841	4.841	(0.985)	1897	0.50000	0.49(M)
	31 1,1,1-Trichloroethane	97	4.852	4.852	(0.987)	2961	0.50000	0.49(M)
	32 1,1-Dichloropropene	75	5.025	5.025	(0.890)	2863	0.50000	0.52(M)
	33 1,2-Dichloroethane	62	5.272	5.272	(0.934)	3496	0.50000	0.53(M)
	34 Carbon Tetrachloride	117	5.014	5.014	(0.888)	2467	0.50000	0.52(MH)
$	35 1,2-Dichloroethane-d4	65	5.182	5.182	(1.054)	2782	0.50000	0.57(M)
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	703570	50.0000	
	37 Benzene	78	5.239	5.239	(0.928)	9529	0.50000	0.53
	38 Trichloroethene	130	5.891	5.891	(1.043)	2302	0.50000	0.50
	39 Bromodichloromethane	83	6.359	6.359	(1.126)	2879	0.50000	0.51(M)
	42 1,2-Dichloropropane	63	6.108	6.108	(1.082)	2920	0.50000	0.58
	45 4-Methyl-2-Pentanone	43	6.933	6.933	(0.839)	8770	1.00000	4.36(M)
	46 cis-1,3-Dichloropropene	75	6.775	6.775	(1.200)	3543	0.50000	0.47
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	631123	50.0000	
$	48 Toluene-d8	98	7.008	7.008	(0.848)	11710	0.50000	1.00(M)
	50 Toluene	91	7.064	7.064	(0.854)	9450	0.50000	0.50
	51 trans-1,3-Dichloropropene	75	7.263	7.263	(1.286)	3450	0.50000	0.52
	52 2-Hexanone	43	7.668	7.668	(0.927)	6299	1.00000	3.23(M)
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	1816	0.50000	0.48(M)
	54 1,3-Dichloropropane	76	7.570	7.570	(0.916)	4055	0.50000	0.53
	55 Dibromochloromethane	129	7.765	7.765	(0.939)	2565	0.50000	0.52
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	2148	0.50000	0.55(M)
	57 1,2-Dibromoethane	107	7.866	7.866	(0.951)	2339	0.50000	0.51
	59 Chlorobenzene	112	8.290	8.290	(1.003)	7508	0.50000	0.59
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	2196	0.50000	0.48
	61 Ethylbenzene	106	8.395	8.395	(1.015)	3694	0.50000	0.59(M)
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	8782	1.00000	1.14
	63 o-Xylene	106	8.837	8.837	(1.069)	4347	0.50000	0.56
	64 Styrene	104	8.845	8.845	(1.070)	7676	0.50000	0.55
	66 Bromoform	173	8.995	8.995	(1.088)	2377	0.50000	1.79(TM)
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	10915	0.50000	0.57
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	4805	0.50000	0.56(M)
$	69 4-Bromofluorobenzene	95	9.268	9.268	(1.121)	4486	0.50000	1.64(M)
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	396710	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	10164	0.50000	0.62
	78 tert-Butylbenzene	119	9.917	9.917	(0.967)	9035	0.50000	0.64(M)
	79 1,2,4-Trimethylbenzene	105	9.966	9.966	(0.972)	10307	0.50000	0.58
	81 sec-Butylbenzene	105	10.112	10.112	(0.986)	11718	0.50000	0.59(M)
	87 n-Butylbenzene	91	10.580	10.580	(1.032)	10473	0.50000	0.61(M)
	73 n-Propylbenzene	91	9.501	9.501	(0.927)	12904	0.50000	0.59
	71 1,2,3-Trichloropropane	75	9.441	9.441	(0.921)	4794	0.50000	0.56(M)
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	7514	0.50000	0.62(M)
	84 1,4-Dichlorobenzene	146	10.269	10.269	(1.002)	8982	0.50000	1.34(M)
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	8824	0.50000	0.78(M)
	89 1,2-Dibromo-3-Chloropropane	155	11.221	11.221	(1.095)	587	0.50000	0.47(M)
	90 1,2,4-Trichlorobenzene	180	11.934	11.934	(1.164)	6080	0.50000	0.76(M)
	92 Naphthalene	128	12.140	12.140	(1.184)	11034	0.50000	0.49(M)
	136 n-Hexane	57	3.477	3.477	(0.707)	1827	0.50000	0.38(T)
	147 Methylcyclohexane	55	6.056	6.056	(1.072)	3395	0.50000	0.52(M)
	141 Cyclohexane	56	4.901	4.901	(0.997)	2342	0.50000	(M)
	138 Freon TF	101	2.450	2.450	(0.498)	1399	0.50000	

146 Methyl Acetate	43	2.813	2.813 (0.572)	1924	0.50000	0.52(M)
21 Vinyl Acetate	43	3.705	3.705 (0.754)	8365	1.00000	0.91(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
26	2,2-Dichloropropane	77	4.298	4.298	(0.874)	3014	0.50000	0.55(M)
44	Dibromomethane	93	6.209	6.209	(1.100)	1690	0.50000	0.58
91	Hexachlorobutadiene	225	12.080	12.080	(1.178)	2181	0.50000	(M)
74	Bromobenzene	156	9.403	9.403	(0.917)	3527	0.50000	0.58
76	2-Chlorotoluene	91	9.568	9.568	(0.933)	8907	0.50000	2.02(M)
77	4-Chlorotoluene	91	9.658	9.658	(0.942)	10622	0.50000	0.62
82	p-Isopropyltoluene	119	10.232	10.232	(0.998)	10492	0.50000	0.58
93	1,2,3-Trichlorobenzene	180	12.342	12.342	(1.204)	5222	0.50000	0.41(M)
148	tert-Butyl Alcohol	59	3.042	3.042	(0.619)	6631	10.0000	11.72
M 94	1,2-Dichloroethylene (total)	96				3734	1.00000	
M 95	Xylenes (total)	106				13129	1.50000	

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.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1.2
1.3
1.4
1.5
1.6
Min
2
3
4
5
6
7
8
9
10
11
12
13
14
-Chloromethane
-1,3-Butadiene+
-Chloroethane+
-Trichlorofluoromethane
-Diethyl ether+
-Freon TF+
-Carbon Disulfide+
-Methyl Acetate+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-n-Hexane
-1,1-Dichloroethane
-Vinyl Acetate+
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile
-Chloroform+
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane-d4
-Benzene+
-tert-Amyl alcohol
-Isobutyl Alcohol+
-1,4-Difluorobenzene
-Trichloroethene+
-1,2-Dichloropropane+
-Dibromomethane+
-Bromodichloromethane
-2-Nitropropane+
-cis-1,3-Dichloropropene
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene+
-trans-1,3-Dichloropropene+
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-Bromobenzene+
-n-Propylbenzene+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-1,2,4-Trimethylbenzene+
-sec-Butylbenzene
-1,3-Dichlorobenzene
-1,2,3-Trimethylbenzene
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,3,5-Trichlorobenzene+
-2-Methylnaphthalene
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Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10.i
Operator: FT
Column diameter: 0.18
Page 1

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Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Dichlorodifluoromethane (75-71-8)

Reason Code:

BEFORE

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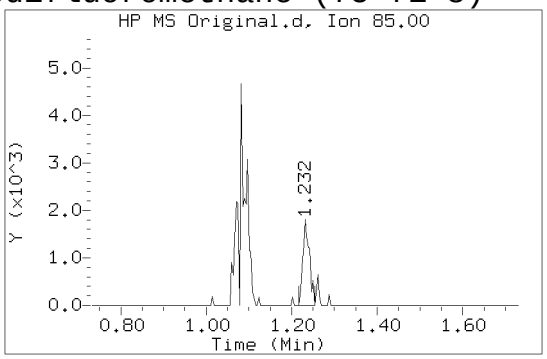
1807
17-Nov-2022
13:58
linh
pham



AFTER

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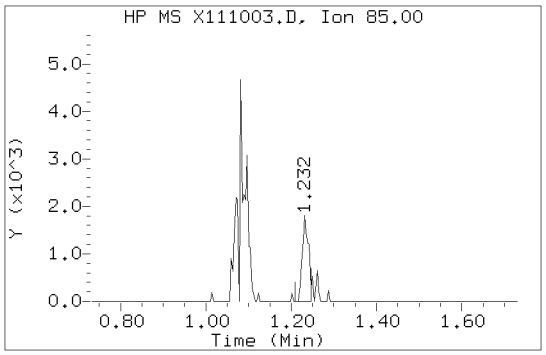

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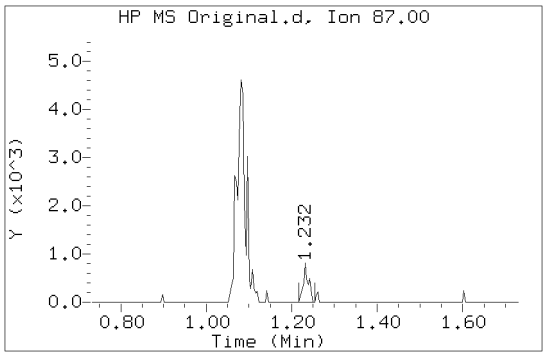

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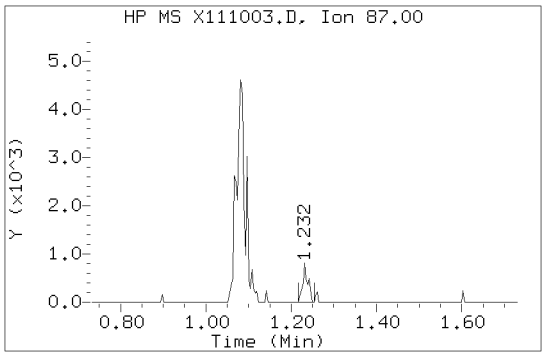

Chloromethane (74-87-3)

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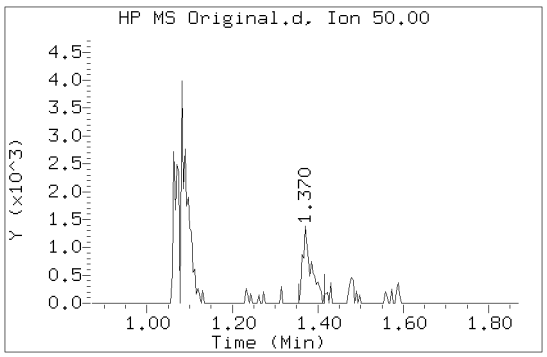

AFTER

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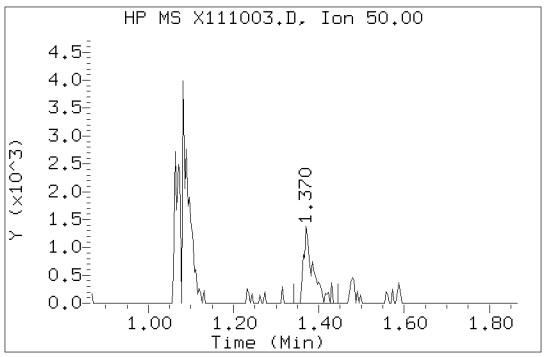

BEFORE

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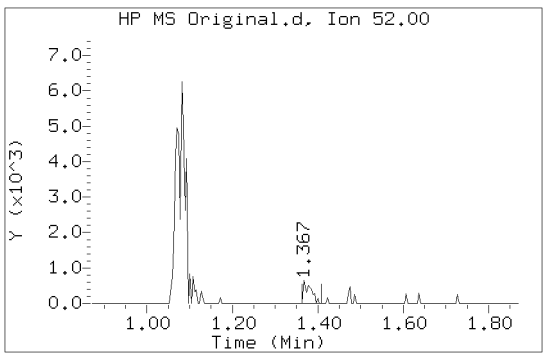

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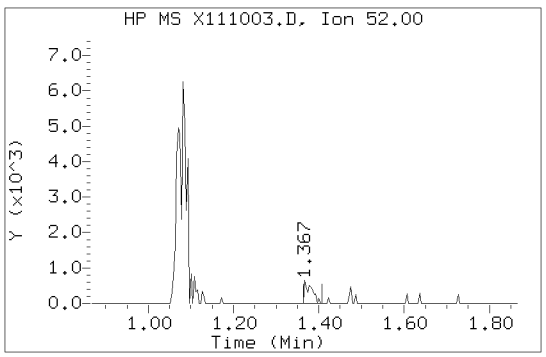

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Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Vinyl Chloride (75-01-4)

Reason Code:

BEFORE

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HEIGHT
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17-Nov-2022
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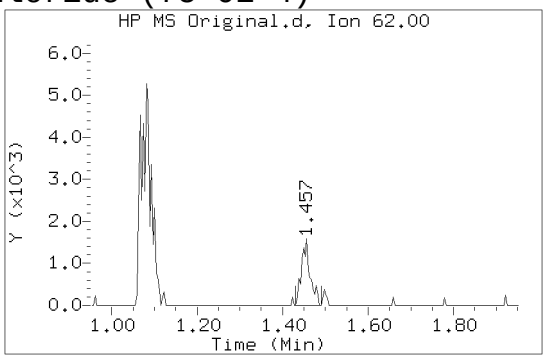

AFTER

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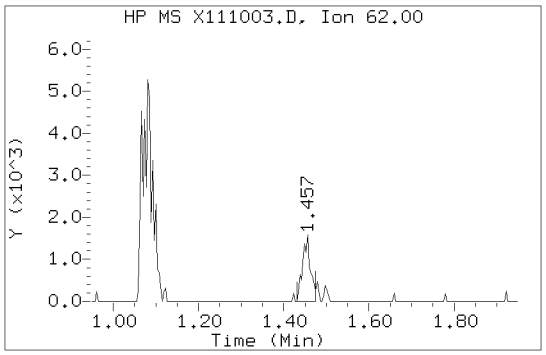

BEFORE

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626
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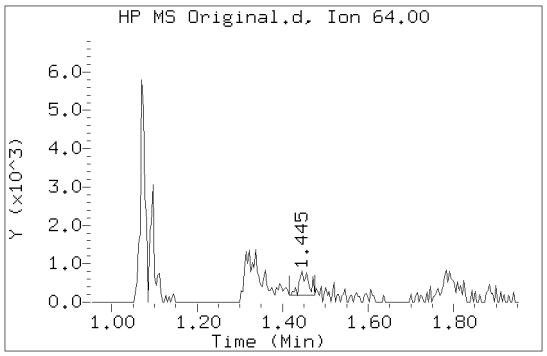

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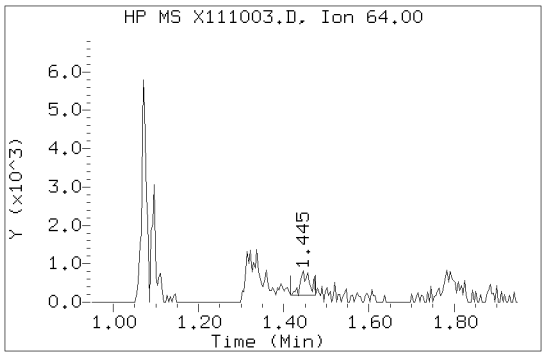

Bromomethane (74-83-9)

Reason Code:

BEFORE

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linh
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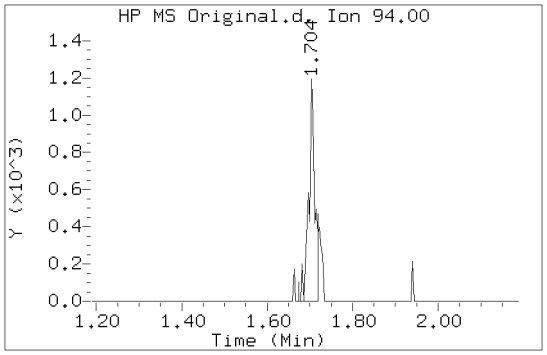

AFTER

MASS
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AREA
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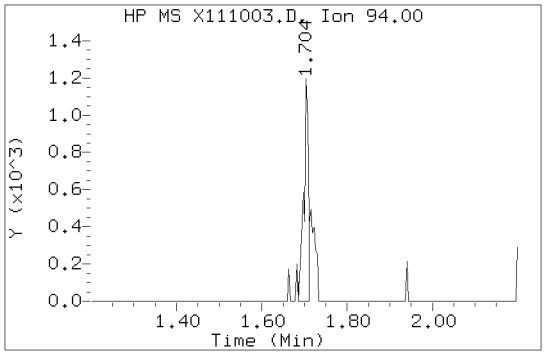
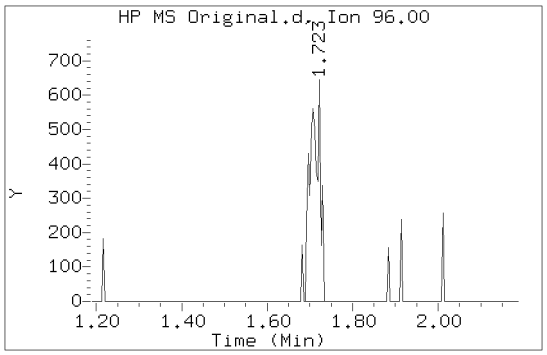
HEIGHT
1195
17-Nov-2022
14:02
linh
pham



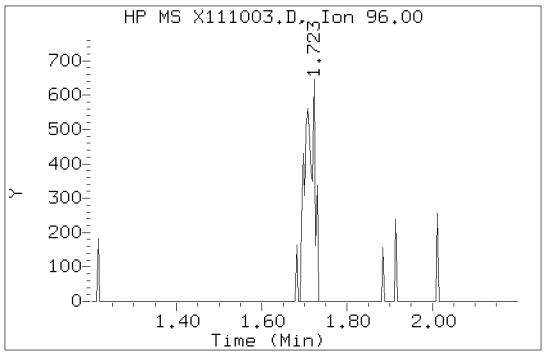
BEFORE

MASS
96
AREA
991
HEIGHT
645
17-Nov-2022
13:58
linh
pham



AFTER

MASS
96
AREA
991
HEIGHT
645
17-Nov-2022
14:02
linh
pham

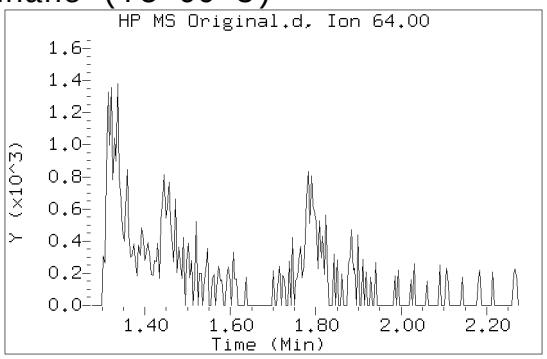


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

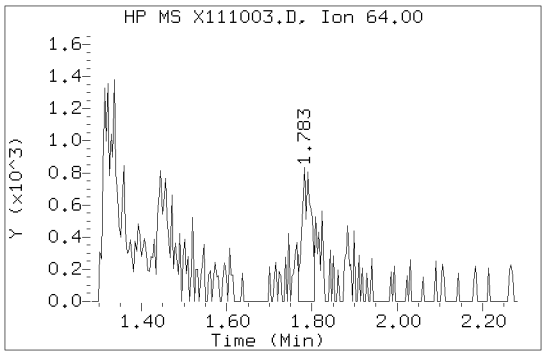
Chloroethane (75-00-3)

Reason Code:

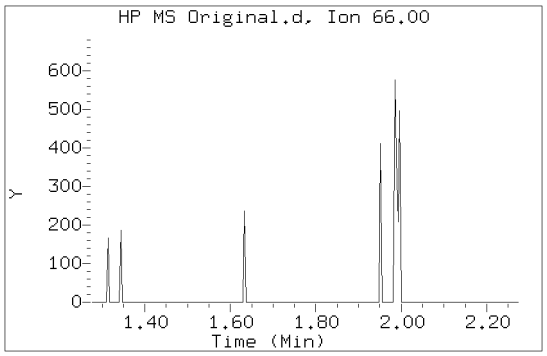
BEFORE
MASS
64
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



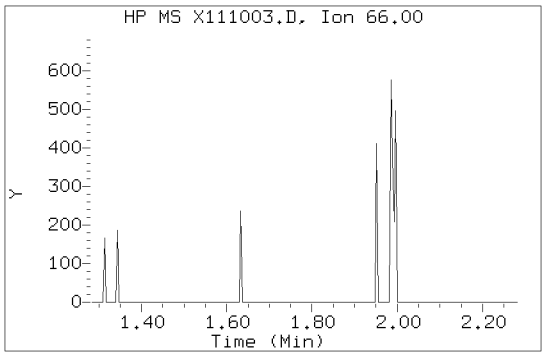
AFTER
MASS
64
AREA
1257
HEIGHT
833
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
66
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



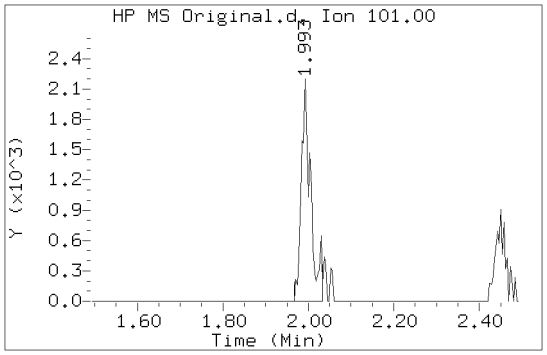
AFTER
MASS
66
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



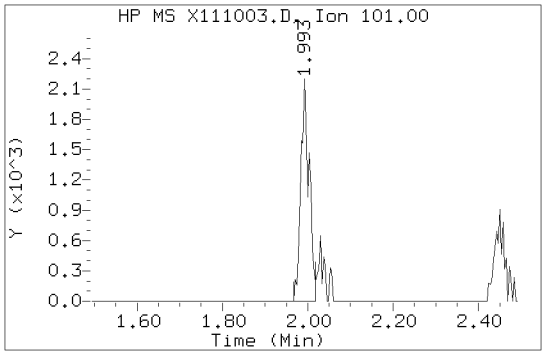
Trichlorofluoromethane (75-69-4)

Reason Code:

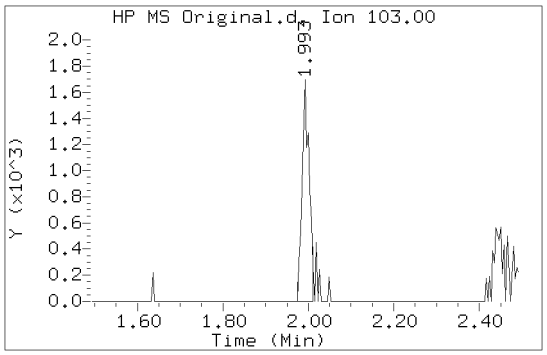
BEFORE
MASS
101
AREA
3377
HEIGHT
2200
17-Nov-2022
13:58
linh
pham



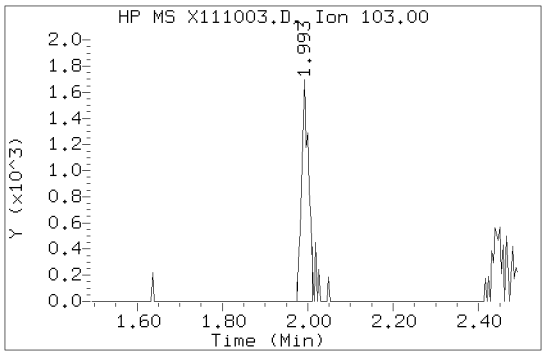
AFTER
MASS
101
AREA
3060
HEIGHT
2200
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
103
AREA
1989
HEIGHT
1696
17-Nov-2022
13:58
linh
pham



AFTER
MASS
103
AREA
1989
HEIGHT
1696
17-Nov-2022
14:02
linh
pham

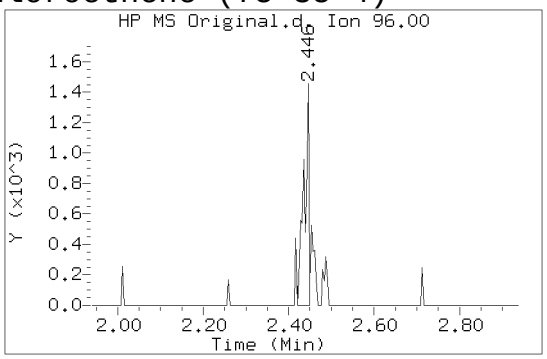


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

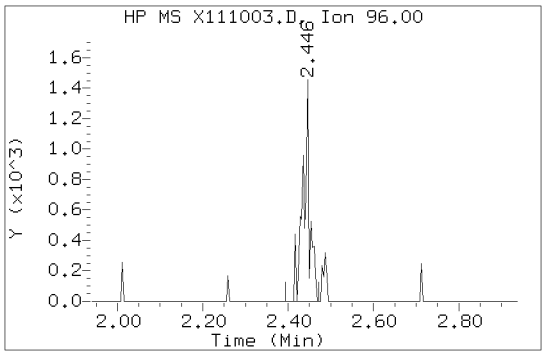
1,1-Dichloroethene (75-35-4)

Reason Code:

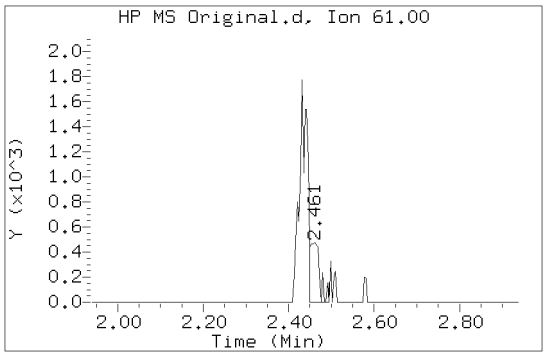
BEFORE
MASS
96
AREA
1130
HEIGHT
1456
17-Nov-2022
13:58
linh
pham



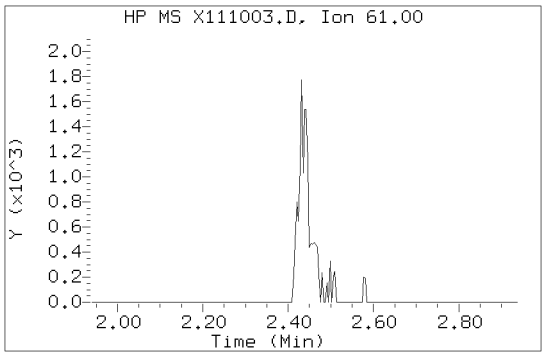
AFTER
MASS
96
AREA
1548
HEIGHT
1456
17-Nov-2022
14:02
linh
pham



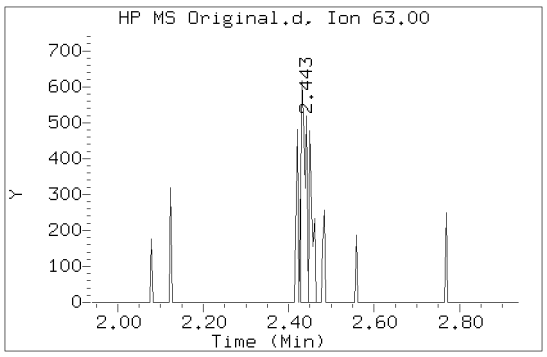
BEFORE
MASS
61
AREA
755
HEIGHT
478
17-Nov-2022
13:58
linh
pham



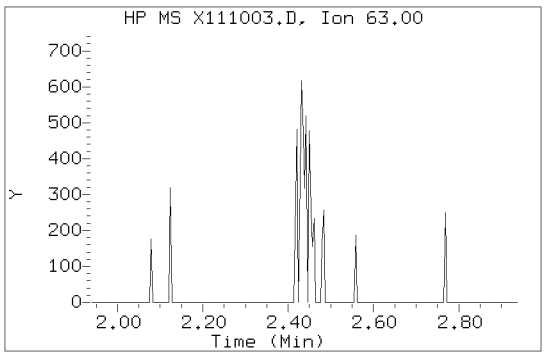
AFTER
MASS
61
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
63
AREA
762
HEIGHT
520
17-Nov-2022
13:58
linh
pham



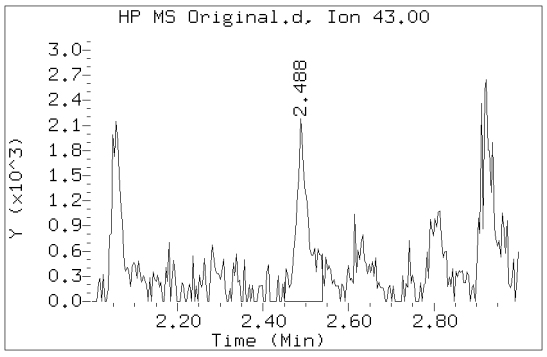
AFTER
MASS
63
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



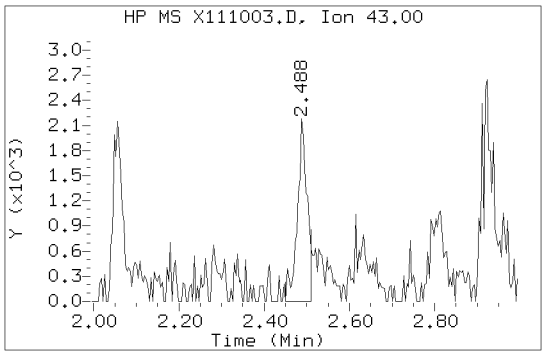
Acetone (67-64-1)

Reason Code:

BEFORE
MASS
43
AREA
4441
HEIGHT
2184
17-Nov-2022
13:58
linh
pham



AFTER
MASS
43
AREA
3505
HEIGHT
2184
17-Nov-2022
14:02
linh
pham



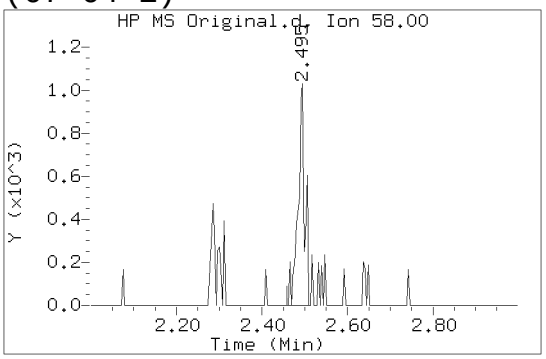
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Acetone (67-64-1)

Reason Code:

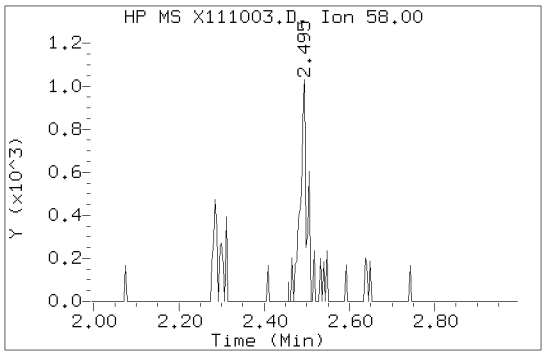
BEFORE

MASS
58
AREA
1134
HEIGHT
1031
17-Nov-2022
13:58
linh
pham



AFTER

MASS
58
AREA
1134
HEIGHT
1031
17-Nov-2022
14:02
linh
pham

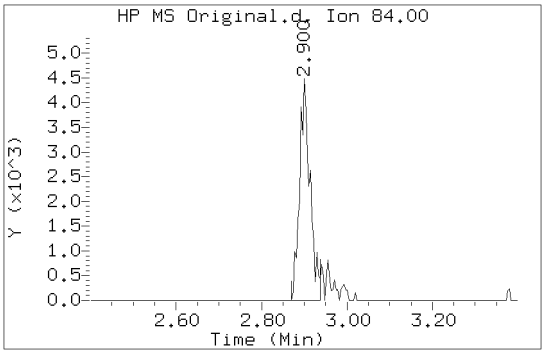


Methylene Chloride (75-09-2)

Reason Code:

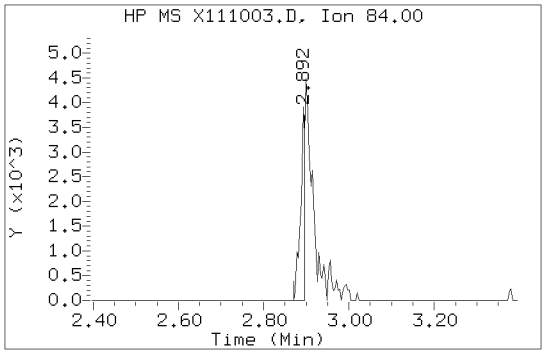
BEFORE

MASS
84
AREA
7700
HEIGHT
4484
17-Nov-2022
13:58
linh
pham



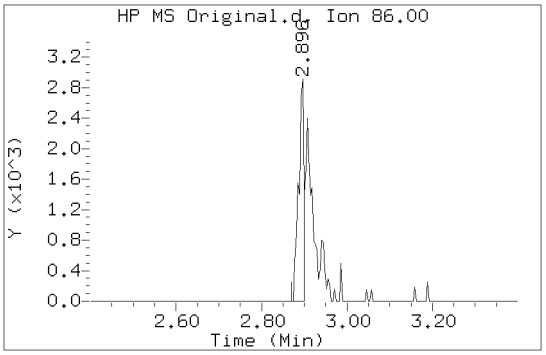
AFTER

MASS
84
AREA
2905
HEIGHT
3916
17-Nov-2022
14:02
linh
pham



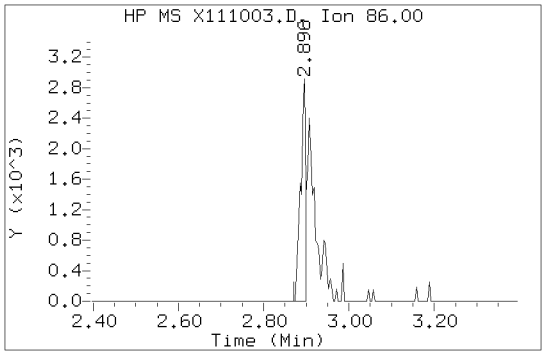
BEFORE

MASS
86
AREA
2553
HEIGHT
2915
17-Nov-2022
13:58
linh
pham



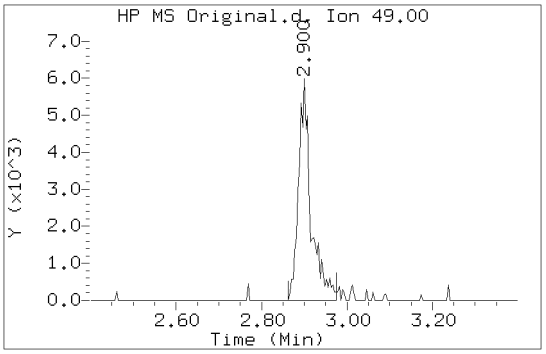
AFTER

MASS
86
AREA
2553
HEIGHT
2915
17-Nov-2022
14:02
linh
pham



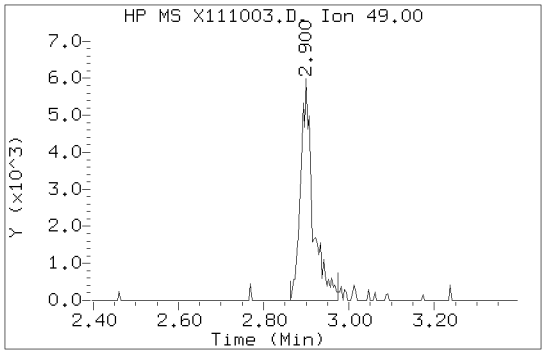
BEFORE

MASS
49
AREA
12249
HEIGHT
5988
17-Nov-2022
13:58
linh
pham



AFTER

MASS
49
AREA
12249
HEIGHT
5988
17-Nov-2022
14:02
linh
pham



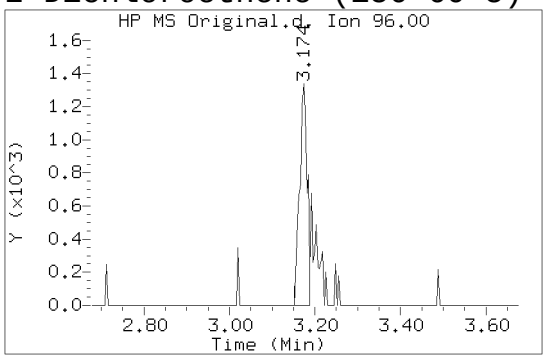
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

trans-1,2-Dichloroethene (156-60-5)

Reason Code:

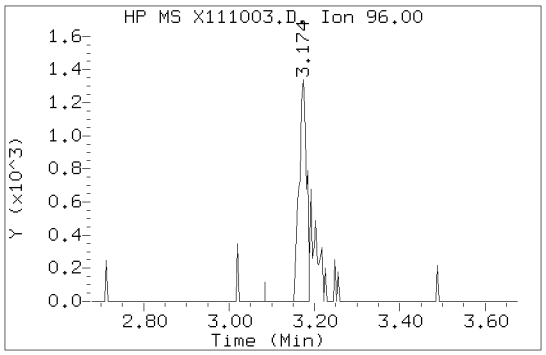
BEFORE

MASS
96
AREA
1682
HEIGHT
1339
17-Nov-2022
13:58
linh
pham



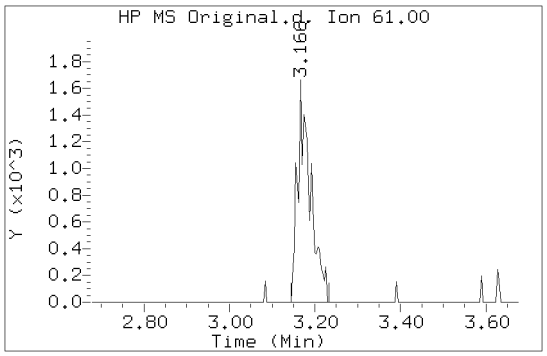
AFTER

MASS
96
AREA
1682
HEIGHT
1339
17-Nov-2022
14:02
linh
pham



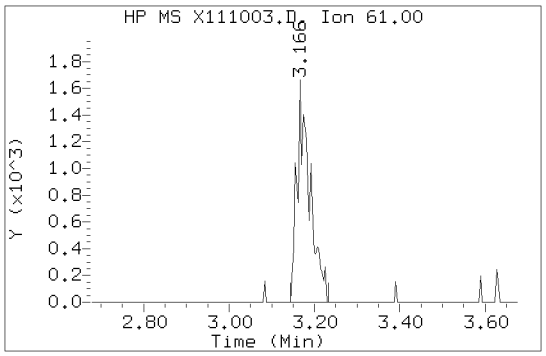
BEFORE

MASS
61
AREA
3500
HEIGHT
1663
17-Nov-2022
13:58
linh
pham



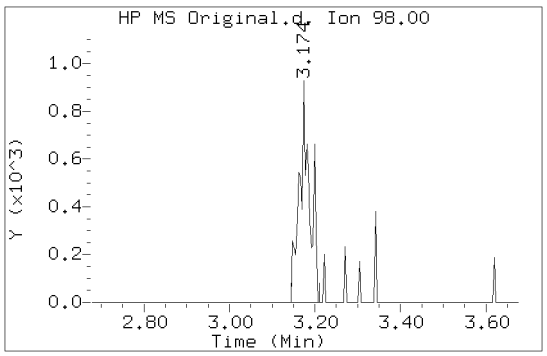
AFTER

MASS
61
AREA
3500
HEIGHT
1663
17-Nov-2022
14:02
linh
pham



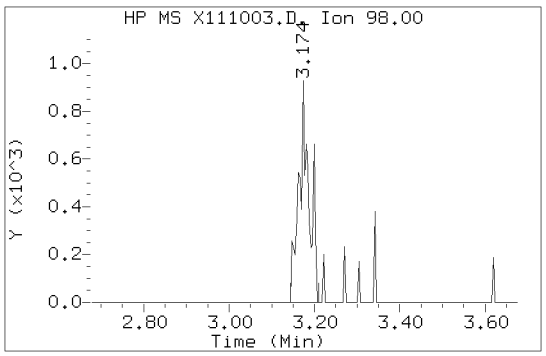
BEFORE

MASS
98
AREA
1557
HEIGHT
928
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
1557
HEIGHT
928
17-Nov-2022
14:02
linh
pham

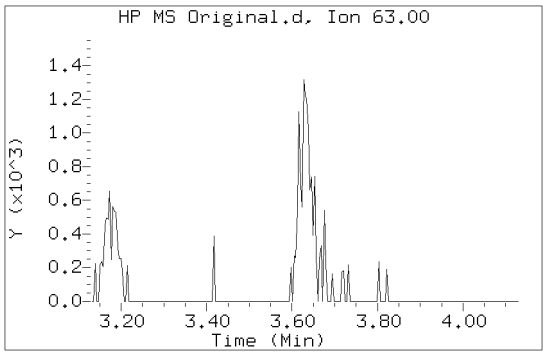


1,1-Dichloroethane (75-34-3)

Reason Code:

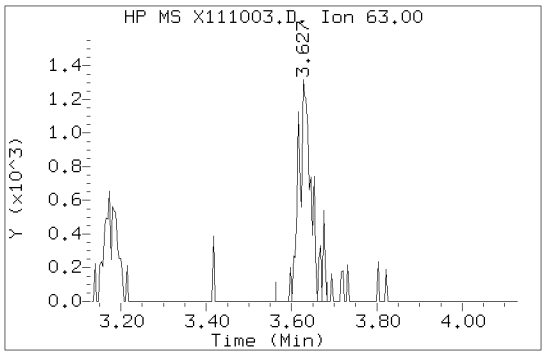
BEFORE

MASS
63
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
63
AREA
2831
HEIGHT
1317
17-Nov-2022
14:02
linh
pham

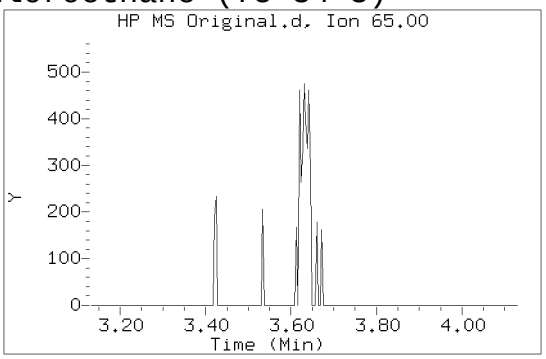


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

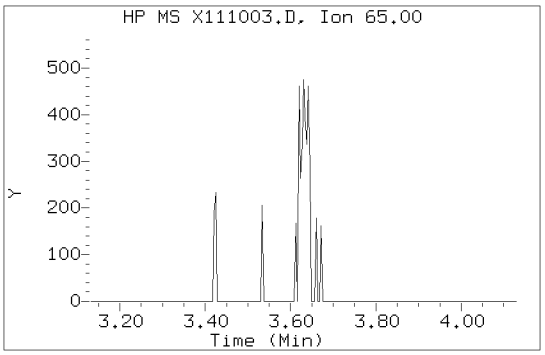
1,1-Dichloroethane (75-34-3)

Reason Code:

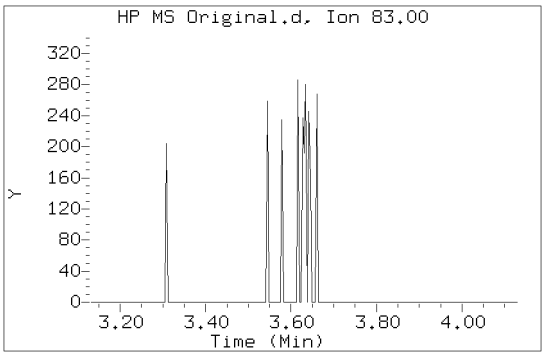
BEFORE
MASS
65
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



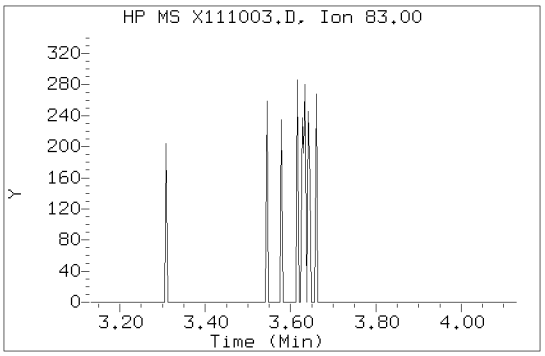
AFTER
MASS
65
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
83
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



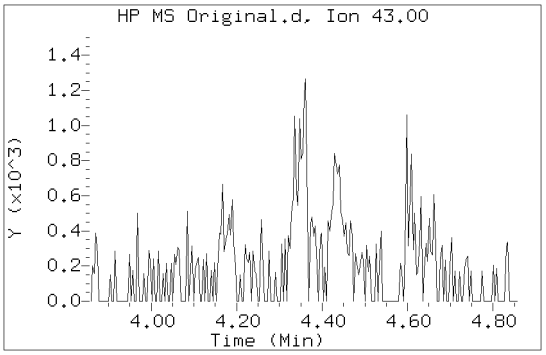
AFTER
MASS
83
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



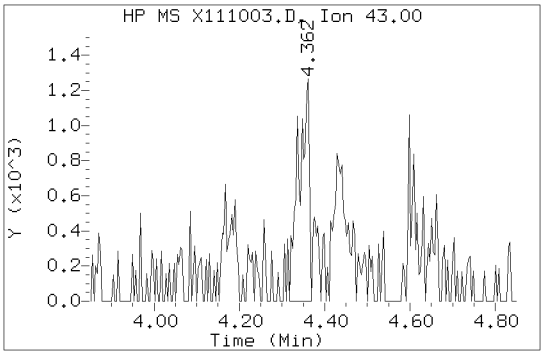
2-Butanone (78-93-3)

Reason Code:

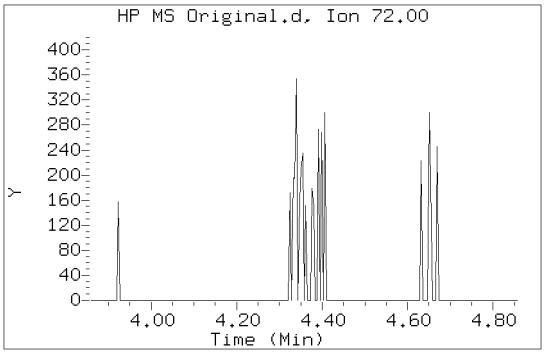
BEFORE
MASS
43
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



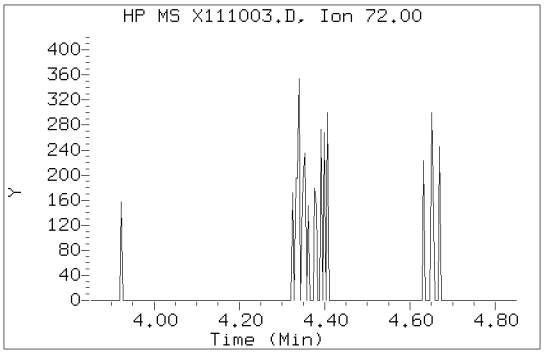
AFTER
MASS
43
AREA
2170
HEIGHT
1265
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
72
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER
MASS
72
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



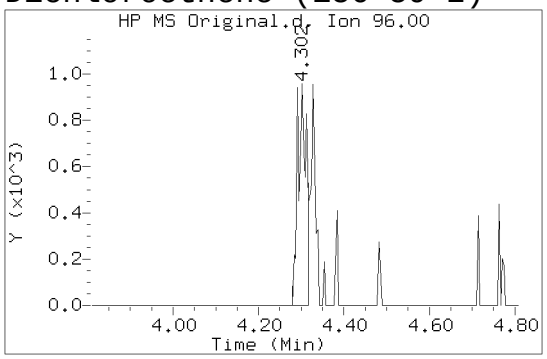
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

cis-1,2-Dichloroethene (156-59-2)

Reason Code:

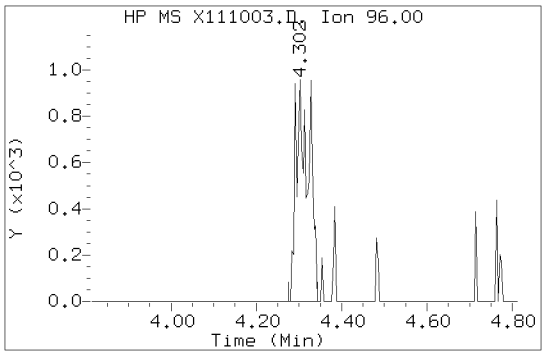
BEFORE

MASS
96
AREA
1338
HEIGHT
958
17-Nov-2022
13:58
linh
pham



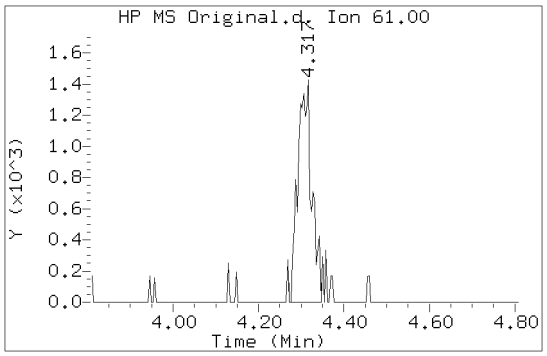
AFTER

MASS
96
AREA
2052
HEIGHT
958
17-Nov-2022
14:02
linh
pham



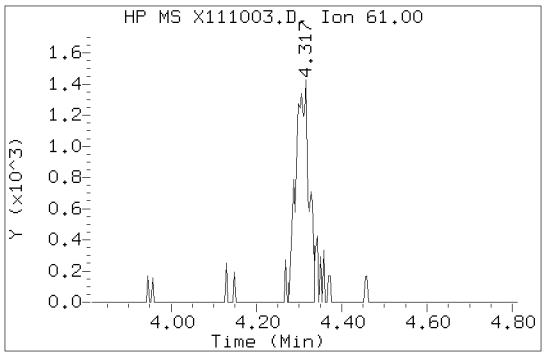
BEFORE

MASS
61
AREA
3248
HEIGHT
1427
17-Nov-2022
13:58
linh
pham



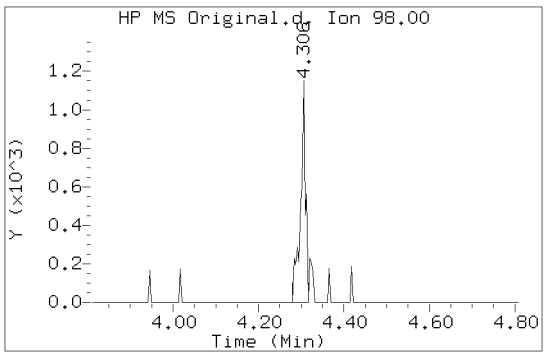
AFTER

MASS
61
AREA
3074
HEIGHT
1427
17-Nov-2022
14:02
linh
pham



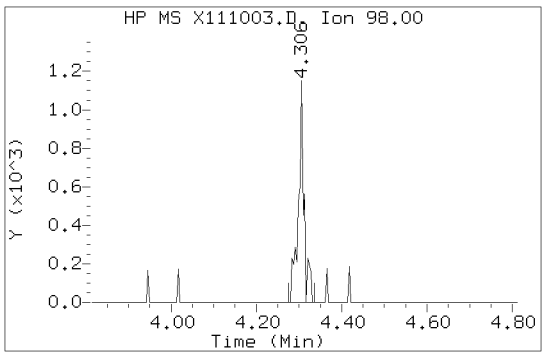
BEFORE

MASS
98
AREA
947
HEIGHT
1151
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
1078
HEIGHT
1151
17-Nov-2022
14:02
linh
pham

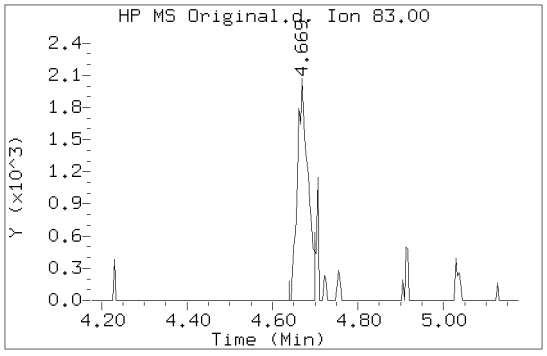


Chloroform (67-66-3)

Reason Code:

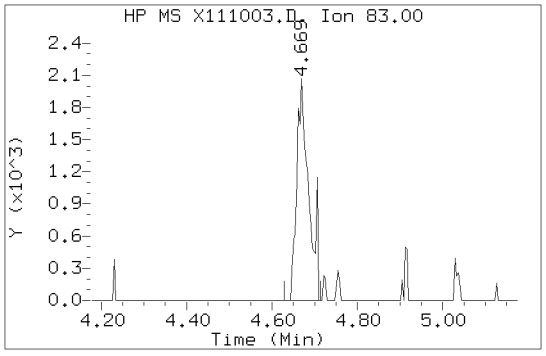
BEFORE

MASS
83
AREA
3647
HEIGHT
2068
17-Nov-2022
13:58
linh
pham



AFTER

MASS
83
AREA
4005
HEIGHT
2068
17-Nov-2022
14:02
linh
pham



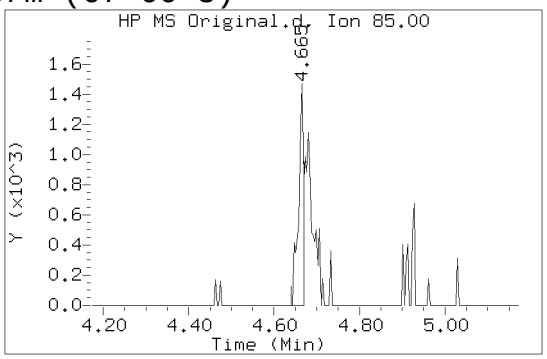
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Chloroform (67-66-3)

Reason Code:

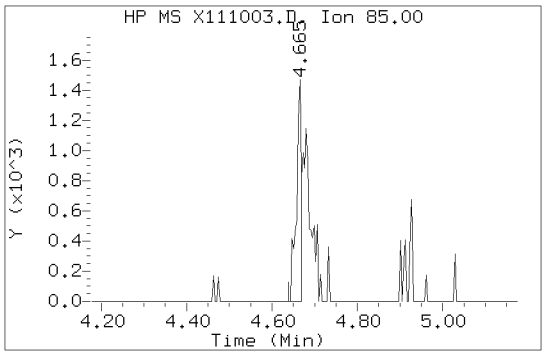
BEFORE

MASS
85
AREA
1184
HEIGHT
1470
17-Nov-2022
13:58
linh
pham



AFTER

MASS
85
AREA
1184
HEIGHT
1470
17-Nov-2022
14:02
linh
pham

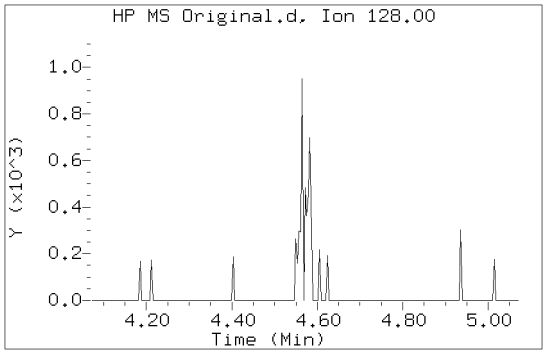


Bromochloromethane (74-97-5)

Reason Code:

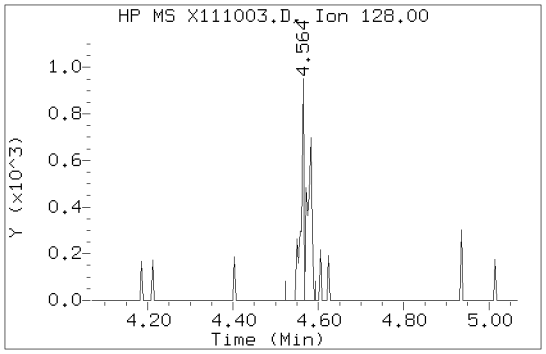
BEFORE

MASS
128
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



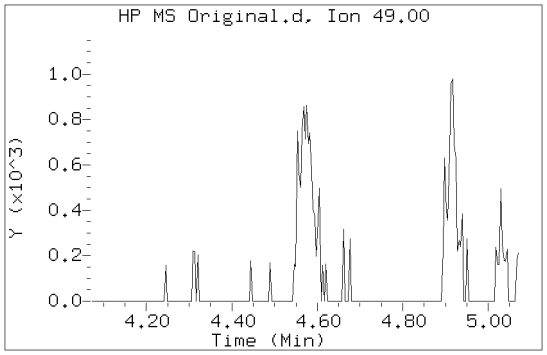
AFTER

MASS
128
AREA
958
HEIGHT
951
17-Nov-2022
14:02
linh
pham



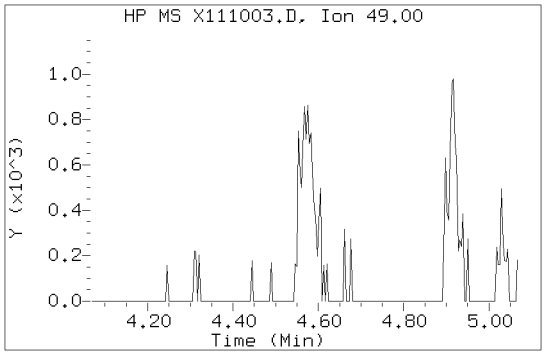
BEFORE

MASS
49
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



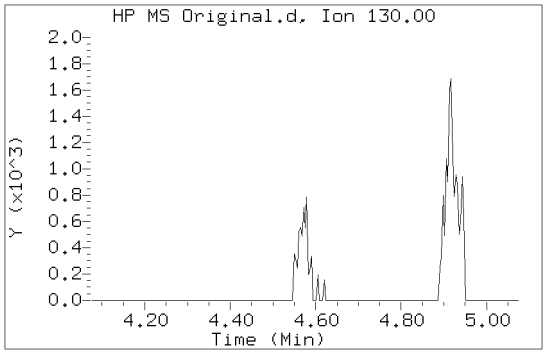
AFTER

MASS
49
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



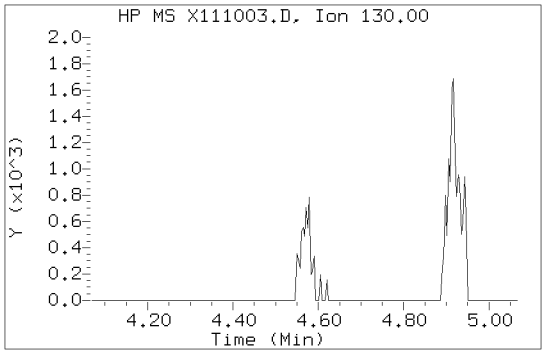
BEFORE

MASS
130
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
130
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



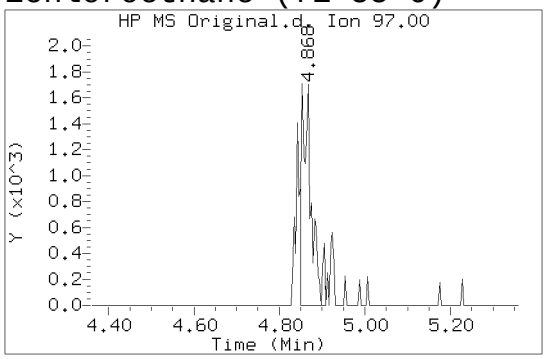
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,1,1-Trichloroethane (71-55-6)

Reason Code:

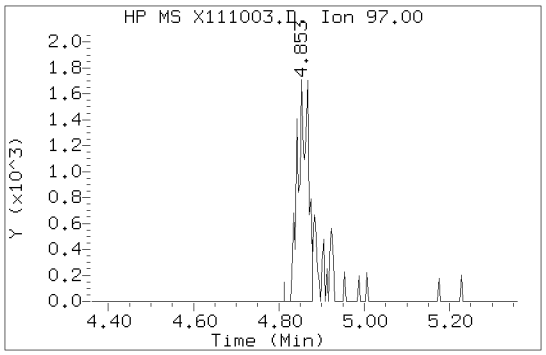
BEFORE

MASS
97
AREA
2721
HEIGHT
1703
17-Nov-2022
13:58
linh
pham



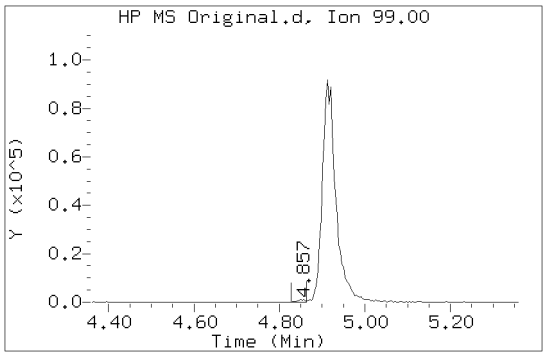
AFTER

MASS
97
AREA
2961
HEIGHT
1709
17-Nov-2022
14:02
linh
pham



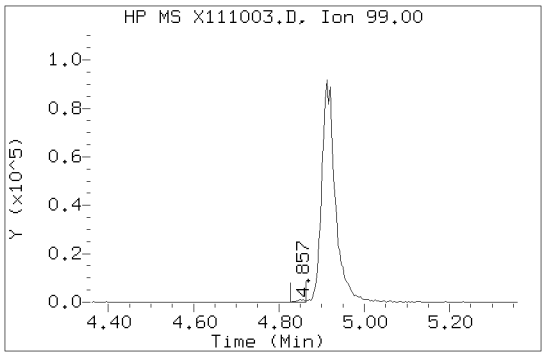
BEFORE

MASS
99
AREA
1353
HEIGHT
991
17-Nov-2022
13:58
linh
pham



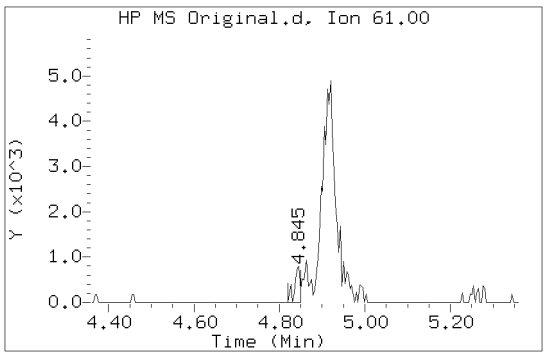
AFTER

MASS
99
AREA
1353
HEIGHT
991
17-Nov-2022
14:02
linh
pham



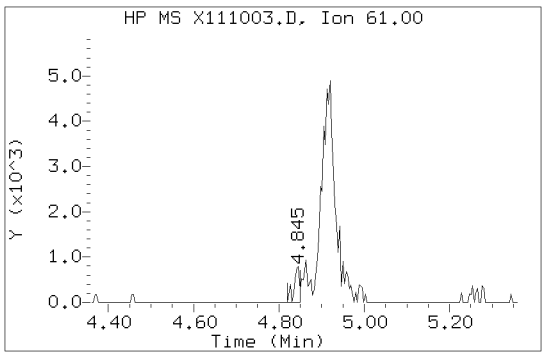
BEFORE

MASS
61
AREA
703
HEIGHT
792
17-Nov-2022
13:58
linh
pham



AFTER

MASS
61
AREA
703
HEIGHT
792
17-Nov-2022
14:02
linh
pham

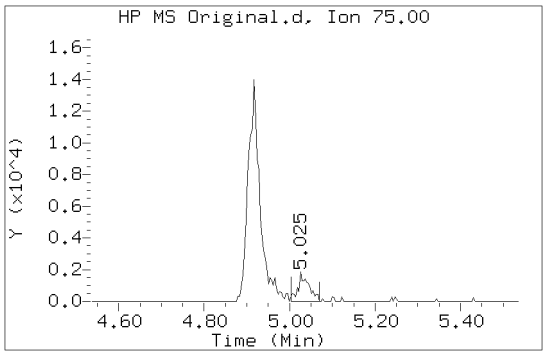


1,1-Dichloropropene (563-58-6)

Reason Code:

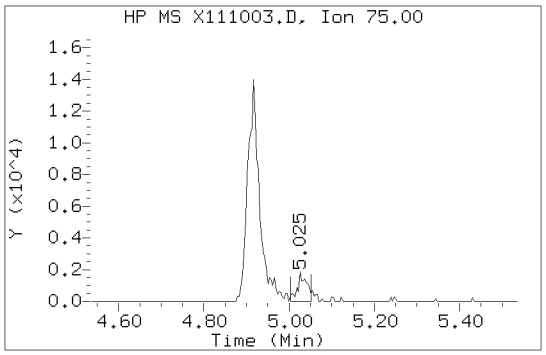
BEFORE

MASS
75
AREA
3296
HEIGHT
1864
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
2863
HEIGHT
1864
17-Nov-2022
14:02
linh
pham



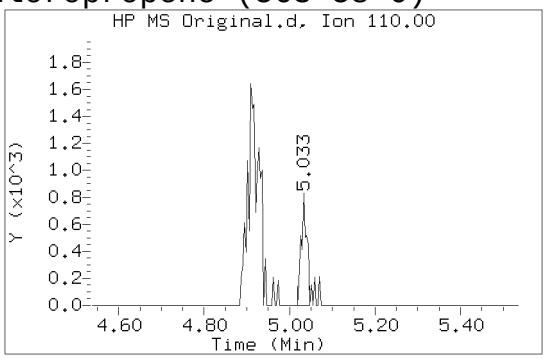
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,1-Dichloropropene (563-58-6)

Reason Code:

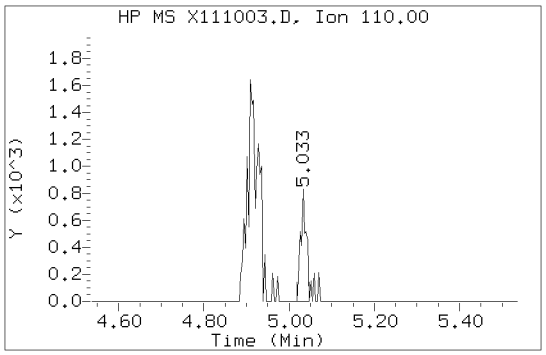
BEFORE

MASS
110
AREA
763
HEIGHT
830
17-Nov-2022
13:58
linh
pham



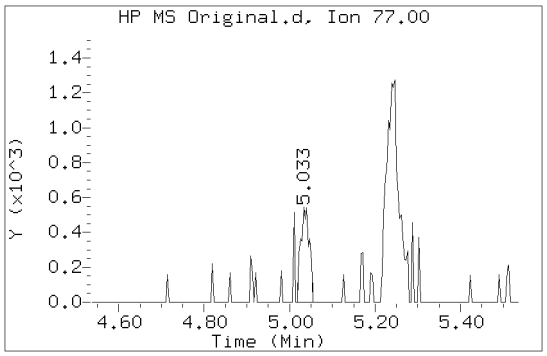
AFTER

MASS
110
AREA
763
HEIGHT
830
17-Nov-2022
14:02
linh
pham



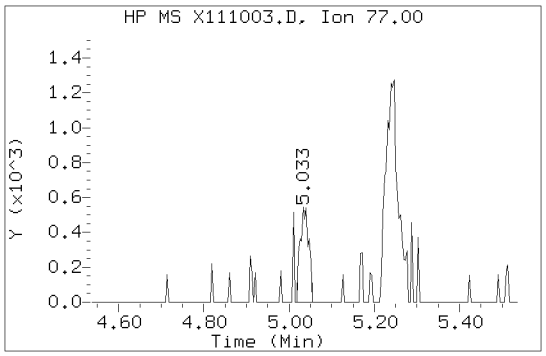
BEFORE

MASS
77
AREA
780
HEIGHT
546
17-Nov-2022
13:58
linh
pham



AFTER

MASS
77
AREA
780
HEIGHT
546
17-Nov-2022
14:02
linh
pham

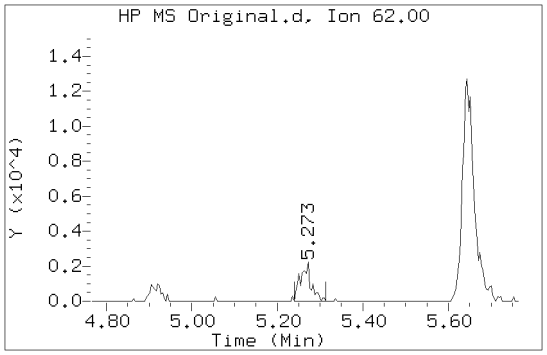


1,2-Dichloroethane (107-06-2)

Reason Code:

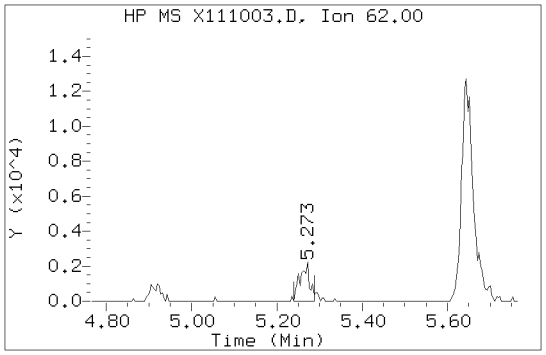
BEFORE

MASS
62
AREA
3861
HEIGHT
2242
17-Nov-2022
13:58
linh
pham



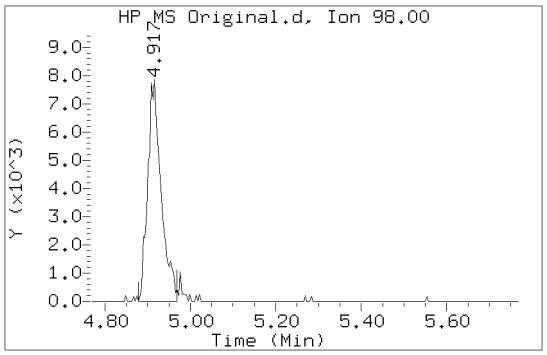
AFTER

MASS
62
AREA
3496
HEIGHT
2242
17-Nov-2022
14:02
linh
pham



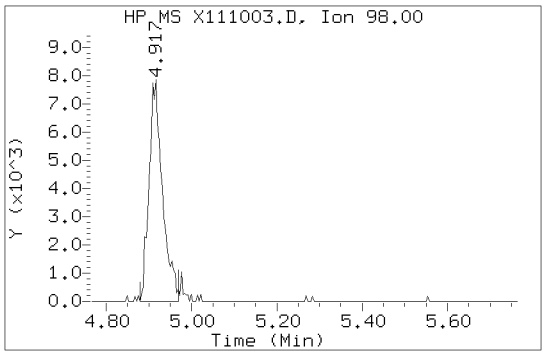
BEFORE

MASS
98
AREA
17172
HEIGHT
7854
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
17172
HEIGHT
7854
17-Nov-2022
14:02
linh
pham

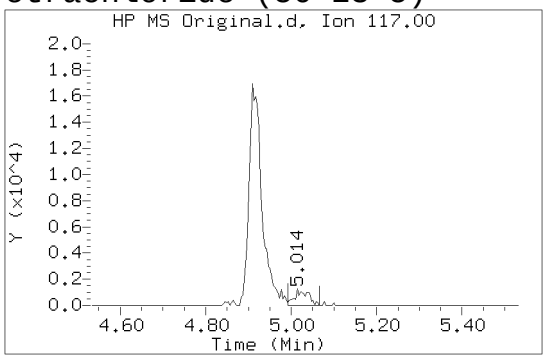


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

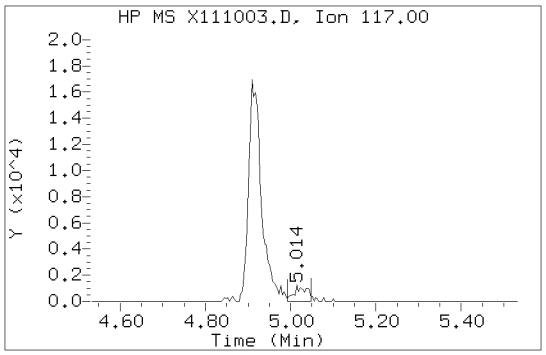
Carbon Tetrachloride (56-23-5)

Reason Code:

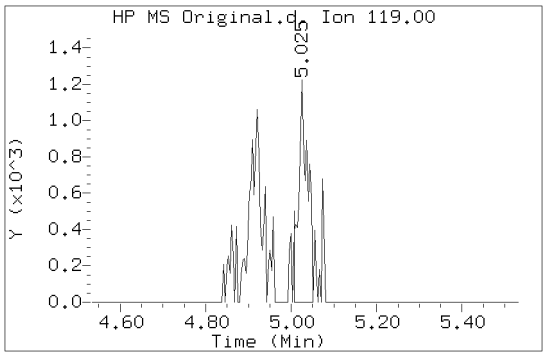
BEFORE
MASS
117
AREA
2746
HEIGHT
1283
17-Nov-2022
13:58
linh
pham



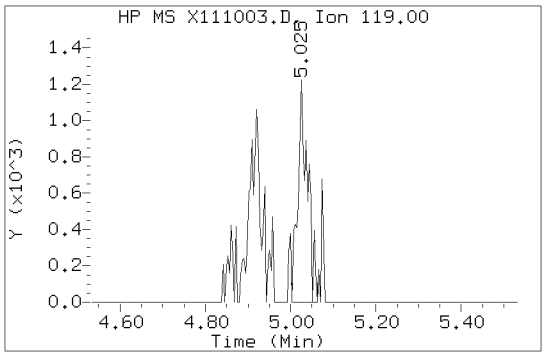
AFTER
MASS
117
AREA
2467
HEIGHT
1259
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
119
AREA
1842
HEIGHT
1224
17-Nov-2022
13:58
linh
pham



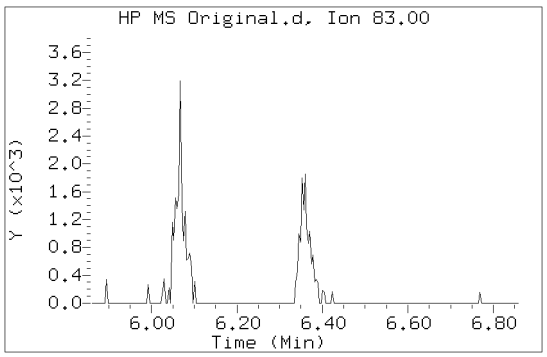
AFTER
MASS
119
AREA
1971
HEIGHT
1224
17-Nov-2022
14:02
linh
pham



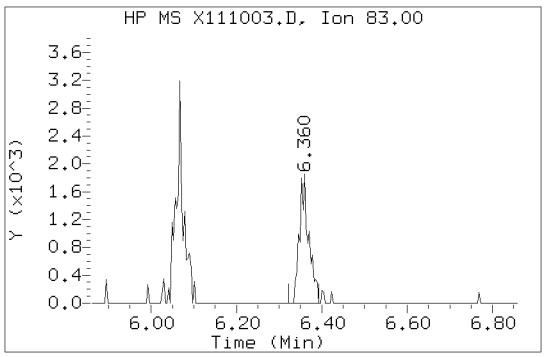
Bromodichloromethane (75-27-4)

Reason Code:

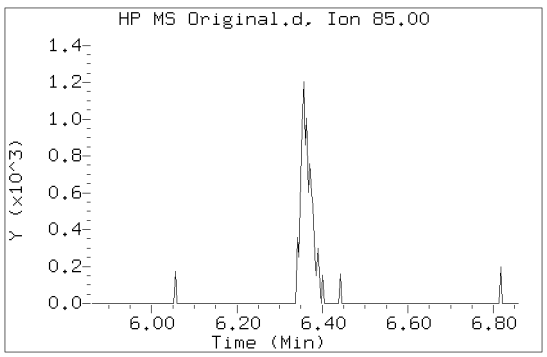
BEFORE
MASS
83
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



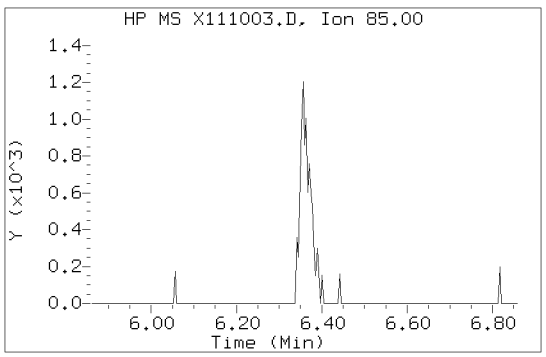
AFTER
MASS
83
AREA
2879
HEIGHT
1851
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
85
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER
MASS
85
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



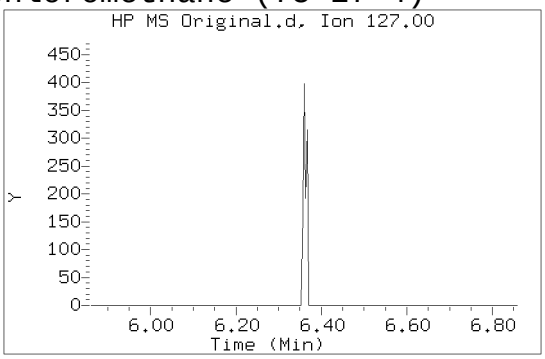
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Bromodichloromethane (75-27-4)

Reason Code:

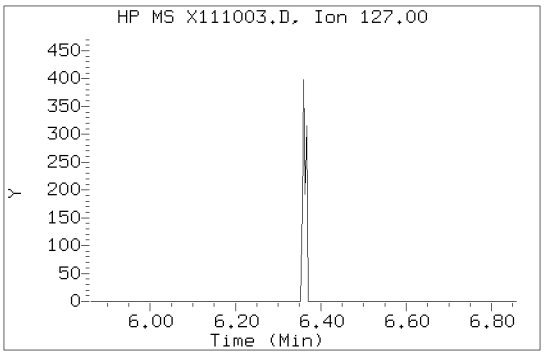
BEFORE

MASS
127
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
127
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

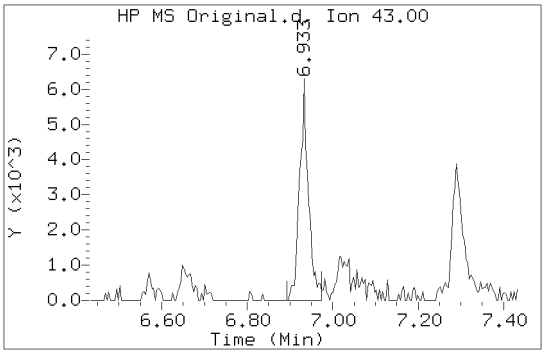


4-Methyl-2-Pentanone (108-10-1)

Reason Code:

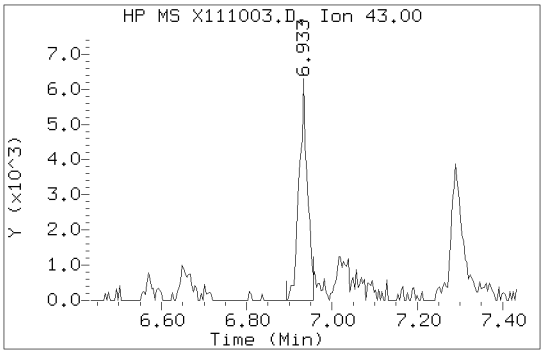
BEFORE

MASS
43
AREA
9313
HEIGHT
6300
17-Nov-2022
13:58
linh
pham



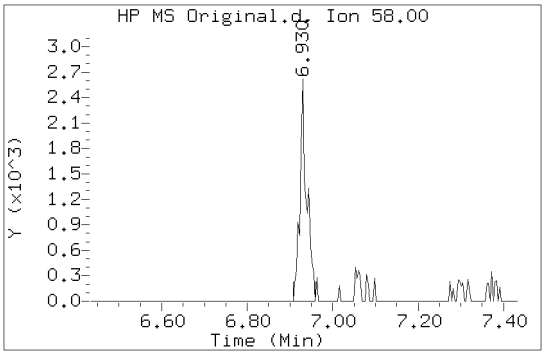
AFTER

MASS
43
AREA
8770
HEIGHT
6300
17-Nov-2022
14:02
linh
pham



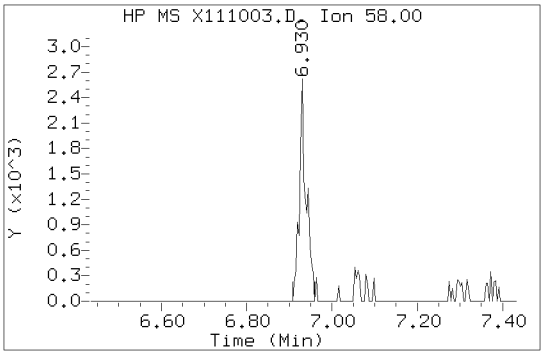
BEFORE

MASS
58
AREA
2971
HEIGHT
2620
17-Nov-2022
13:58
linh
pham



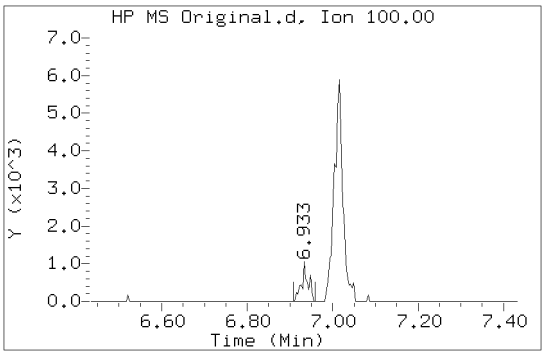
AFTER

MASS
58
AREA
2971
HEIGHT
2620
17-Nov-2022
14:02
linh
pham



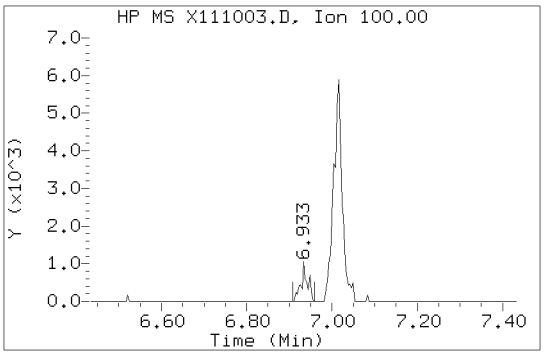
BEFORE

MASS
100
AREA
1134
HEIGHT
1056
17-Nov-2022
13:58
linh
pham



AFTER

MASS
100
AREA
1134
HEIGHT
1056
17-Nov-2022
14:02
linh
pham



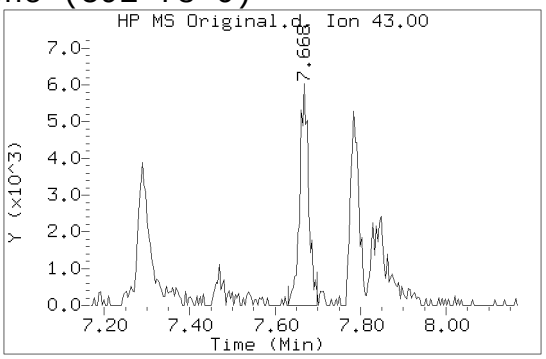
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

2-Hexanone (591-78-6)

Reason Code:

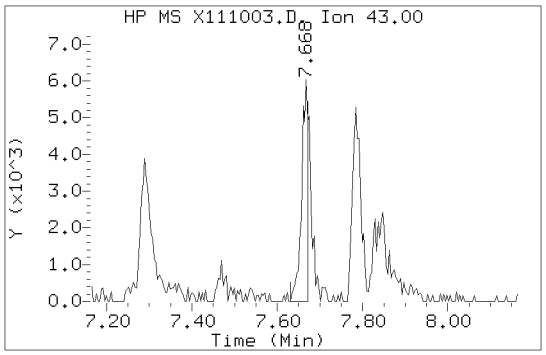
BEFORE

MASS
43
AREA
9079
HEIGHT
6035
17-Nov-2022
13:58
linh
pham



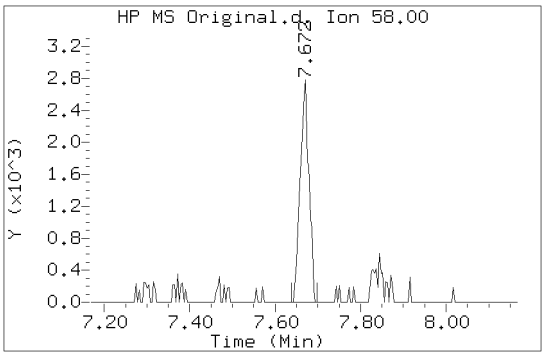
AFTER

MASS
43
AREA
6299
HEIGHT
6035
17-Nov-2022
14:02
linh
pham



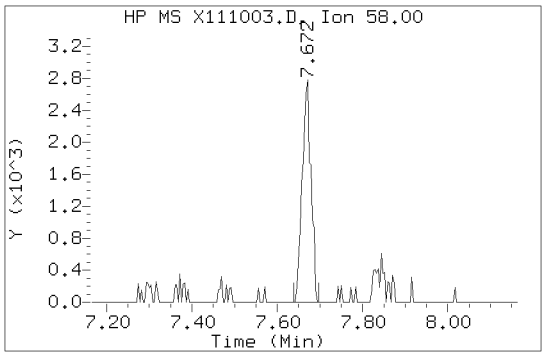
BEFORE

MASS
58
AREA
4064
HEIGHT
2781
17-Nov-2022
13:58
linh
pham



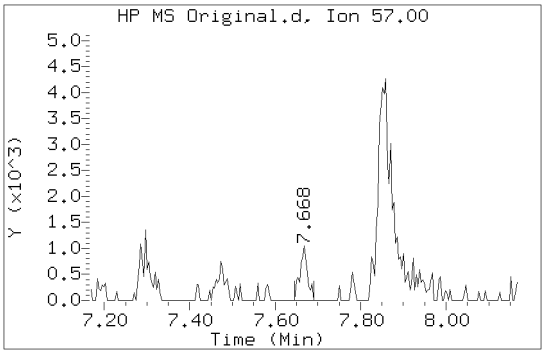
AFTER

MASS
58
AREA
4064
HEIGHT
2781
17-Nov-2022
14:02
linh
pham



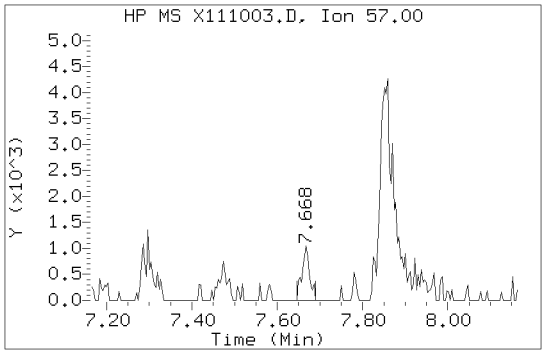
BEFORE

MASS
57
AREA
1337
HEIGHT
1045
17-Nov-2022
13:58
linh
pham



AFTER

MASS
57
AREA
1337
HEIGHT
1045
17-Nov-2022
14:02
linh
pham

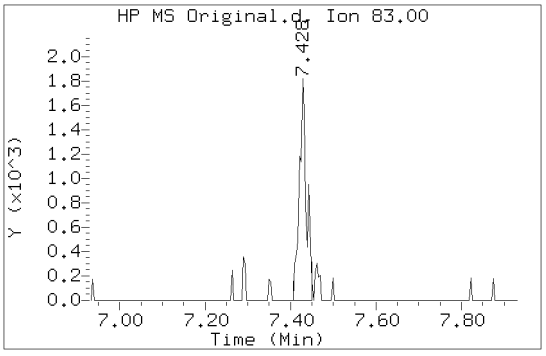


1,1,2-Trichloroethane (79-00-5)

Reason Code:

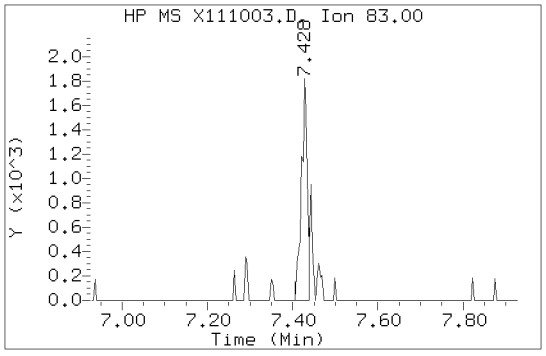
BEFORE

MASS
83
AREA
2162
HEIGHT
1819
17-Nov-2022
13:58
linh
pham



AFTER

MASS
83
AREA
1816
HEIGHT
1819
17-Nov-2022
14:02
linh
pham



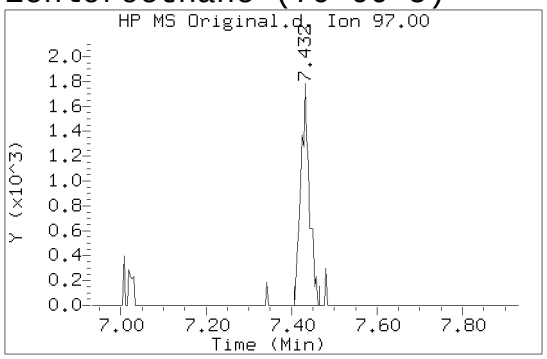
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,1,2-Trichloroethane (79-00-5)

Reason Code:

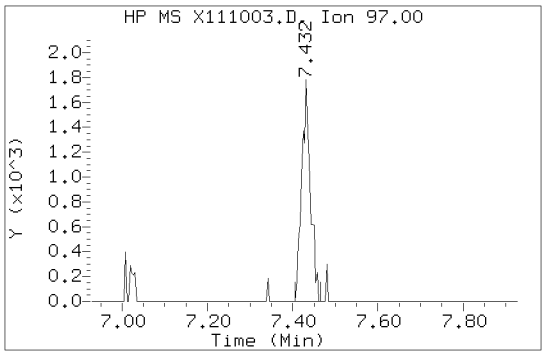
BEFORE

MASS
97
AREA
2570
HEIGHT
1783
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
2570
HEIGHT
1783
17-Nov-2022
14:02
linh
pham

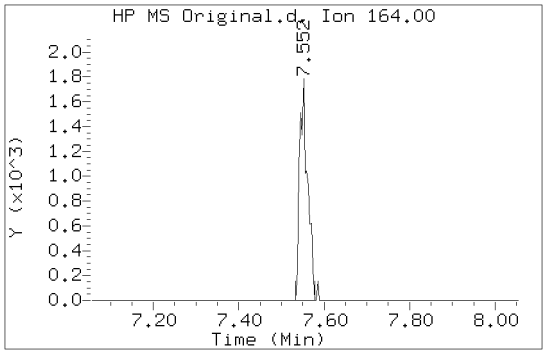


Tetrachloroethene (127-18-4)

Reason Code:

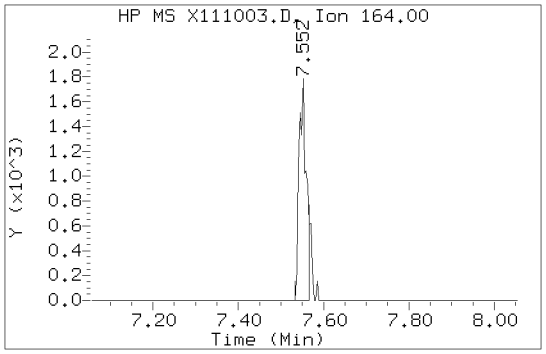
BEFORE

MASS
164
AREA
2344
HEIGHT
1786
17-Nov-2022
13:58
linh
pham



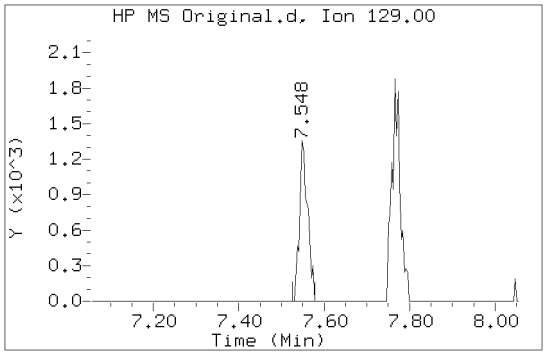
AFTER

MASS
164
AREA
2148
HEIGHT
1786
17-Nov-2022
14:02
linh
pham



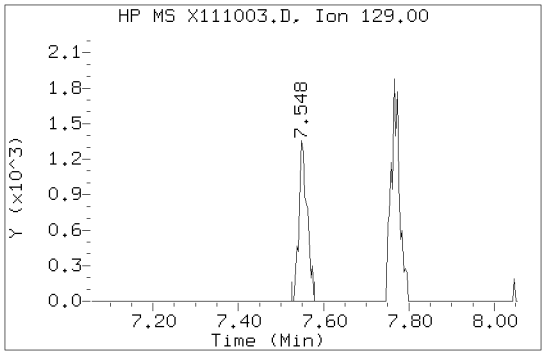
BEFORE

MASS
129
AREA
1850
HEIGHT
1359
17-Nov-2022
13:58
linh
pham



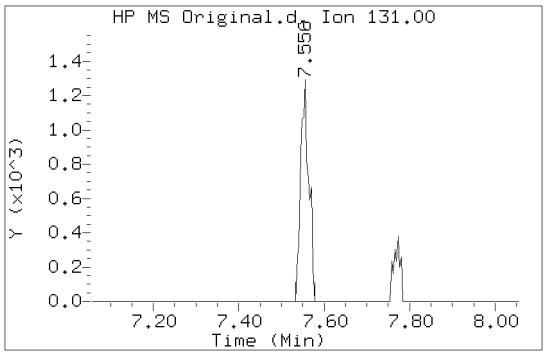
AFTER

MASS
129
AREA
1850
HEIGHT
1359
17-Nov-2022
14:02
linh
pham



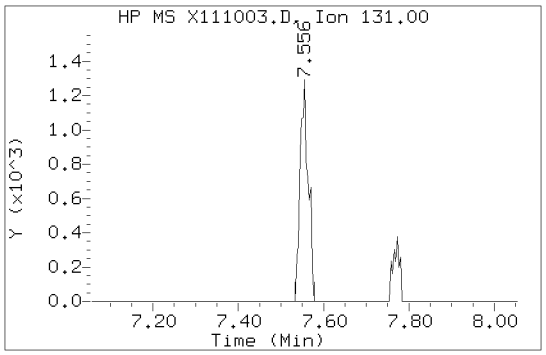
BEFORE

MASS
131
AREA
1768
HEIGHT
1293
17-Nov-2022
13:58
linh
pham



AFTER

MASS
131
AREA
1768
HEIGHT
1293
17-Nov-2022
14:02
linh
pham



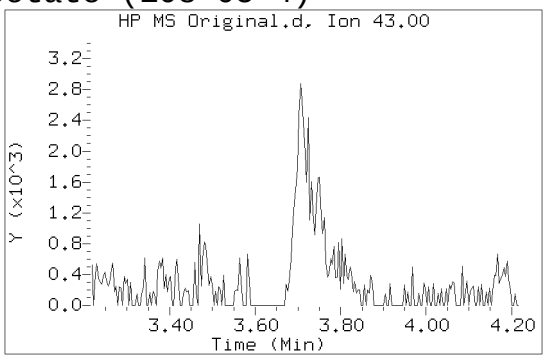
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Vinyl Acetate (108-05-4)

Reason Code:

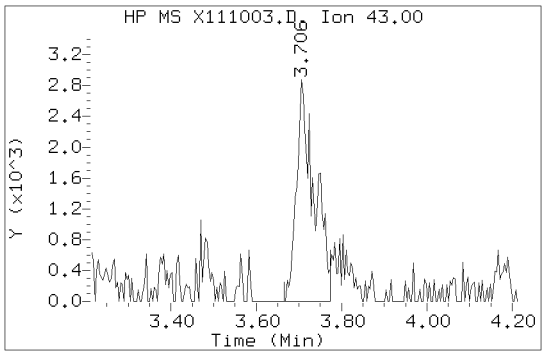
BEFORE

MASS
43
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



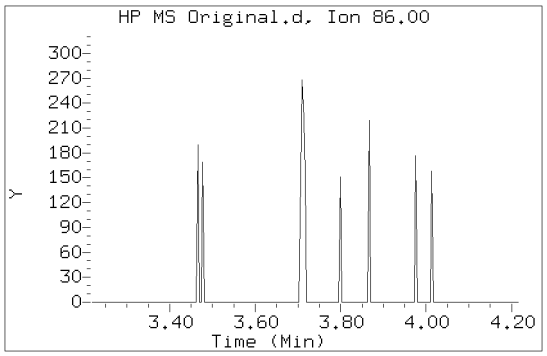
AFTER

MASS
43
AREA
8365
HEIGHT
2876
17-Nov-2022
14:02
linh
pham



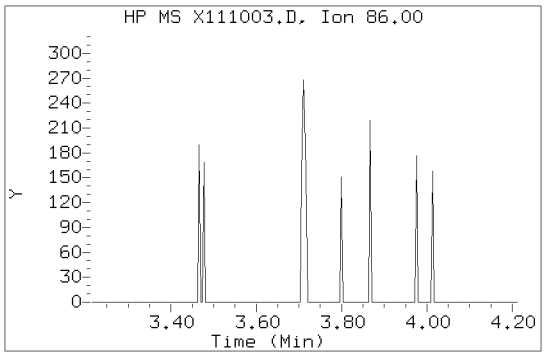
BEFORE

MASS
86
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
86
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

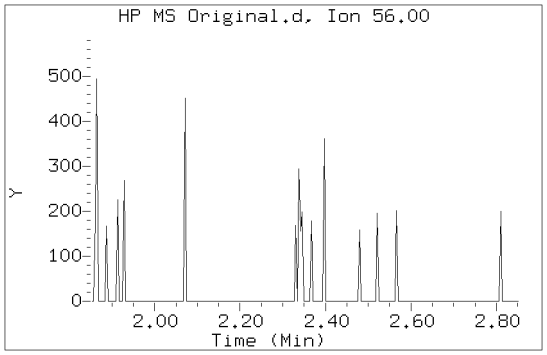


Acrolein (107-02-8)

Reason Code:

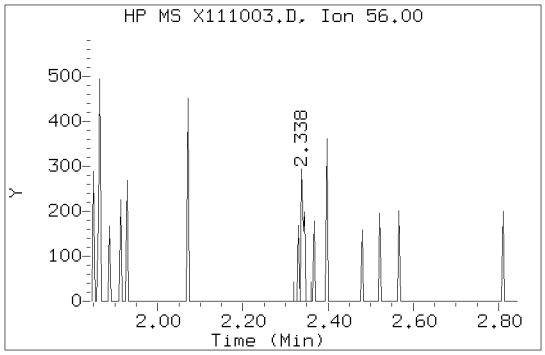
BEFORE

MASS
56
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



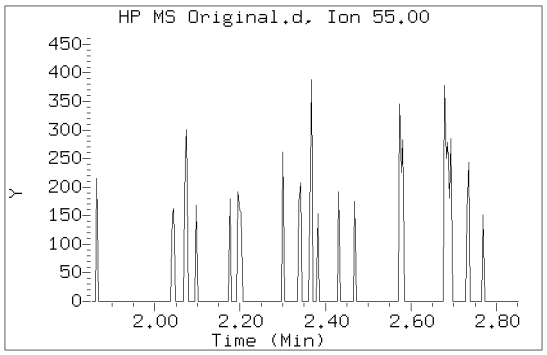
AFTER

MASS
56
AREA
183
HEIGHT
294
17-Nov-2022
14:02
linh
pham



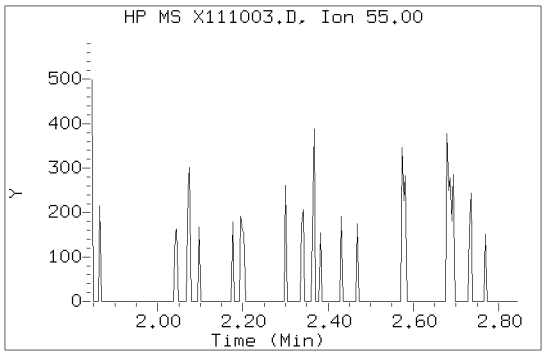
BEFORE

MASS
55
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
55
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



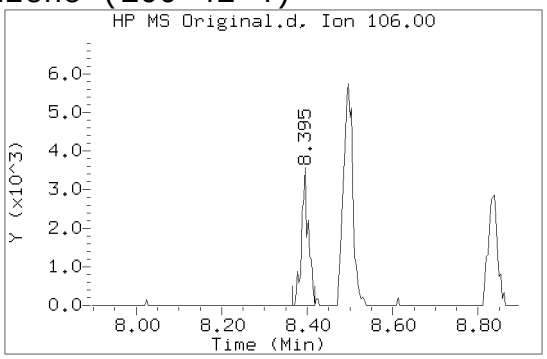
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Ethylbenzene (100-41-4)

Reason Code:

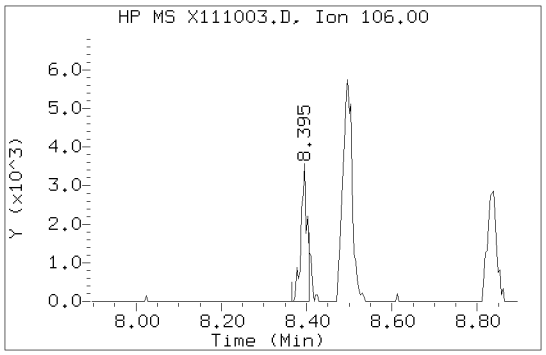
BEFORE

MASS
106
AREA
4065
HEIGHT
3566
17-Nov-2022
13:58
linh
pham



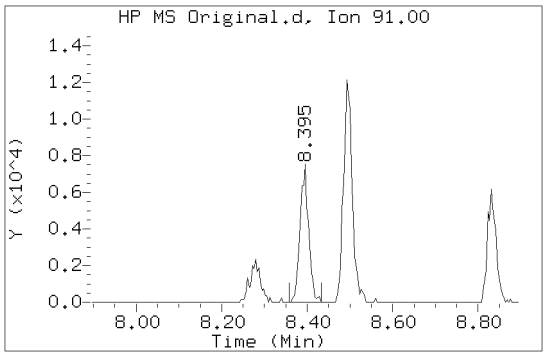
AFTER

MASS
106
AREA
3694
HEIGHT
3566
17-Nov-2022
14:02
linh
pham



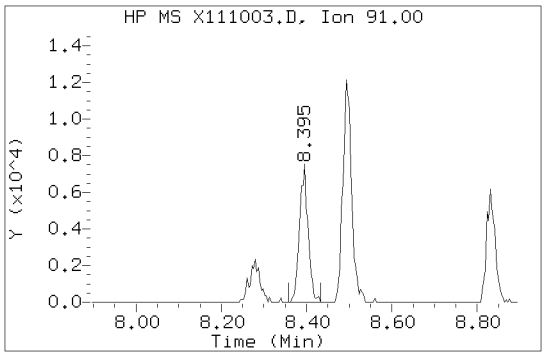
BEFORE

MASS
91
AREA
10777
HEIGHT
7559
17-Nov-2022
13:58
linh
pham



AFTER

MASS
91
AREA
10777
HEIGHT
7559
17-Nov-2022
14:02
linh
pham

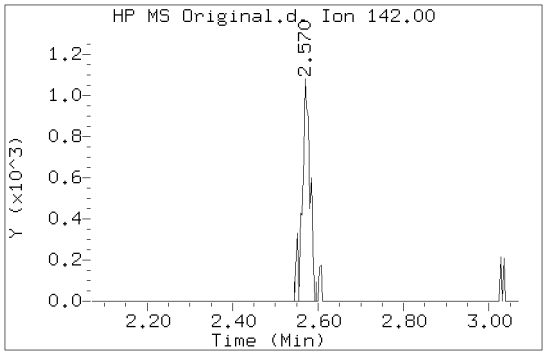


Iodomethane (74-88-4)

Reason Code:

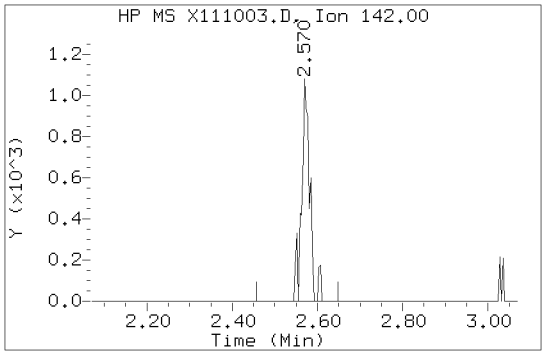
BEFORE

MASS
142
AREA
1412
HEIGHT
1081
17-Nov-2022
13:58
linh
pham



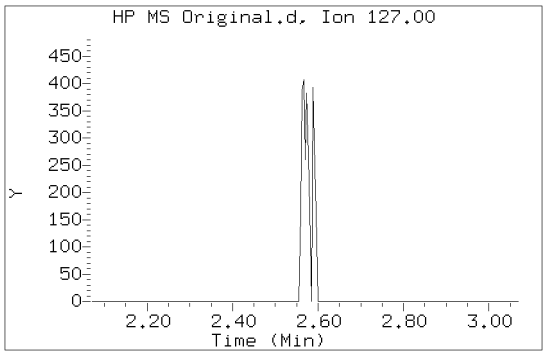
AFTER

MASS
142
AREA
1488
HEIGHT
1081
17-Nov-2022
14:02
linh
pham



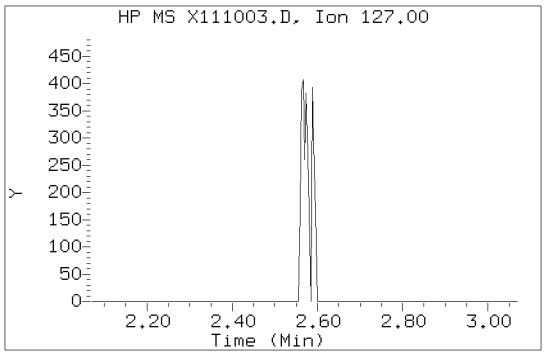
BEFORE

MASS
127
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
127
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



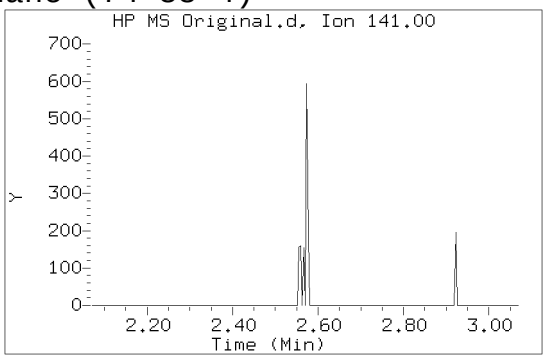
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Iodomethane (74-88-4)

Reason Code:

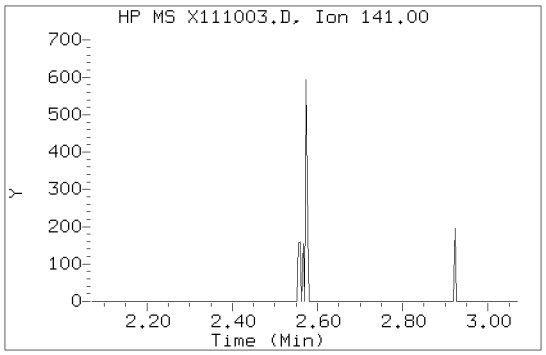
BEFORE

MASS
141
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
141
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

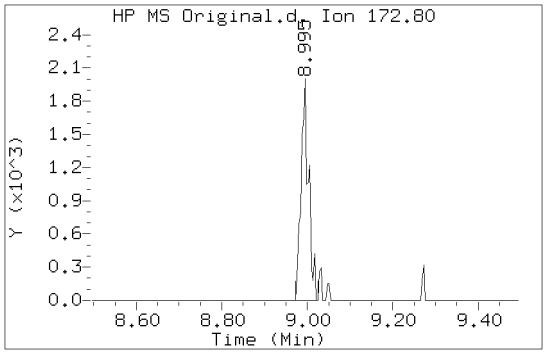


Bromoform (75-25-2)

Reason Code:

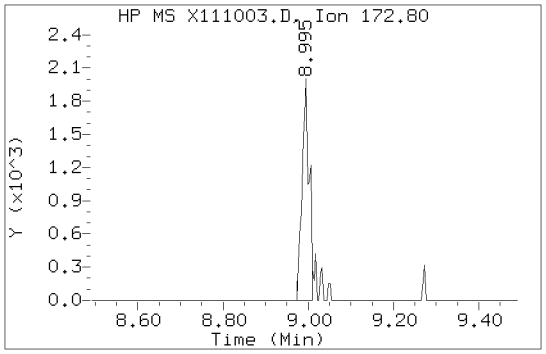
BEFORE

MASS
172.8
AREA
2514
HEIGHT
2003
17-Nov-2022
13:58
linh
pham



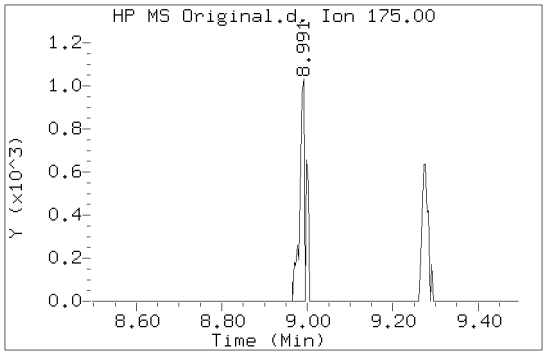
AFTER

MASS
172.8
AREA
2377
HEIGHT
2003
17-Nov-2022
14:02
linh
pham



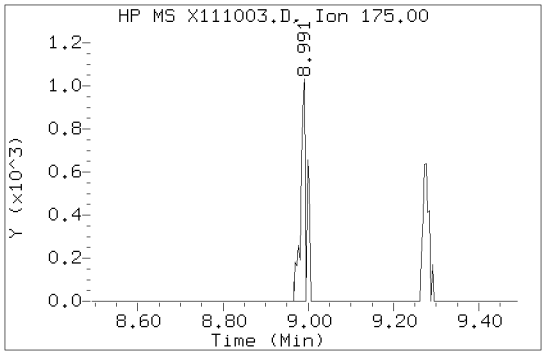
BEFORE

MASS
175
AREA
775
HEIGHT
1033
17-Nov-2022
13:58
linh
pham



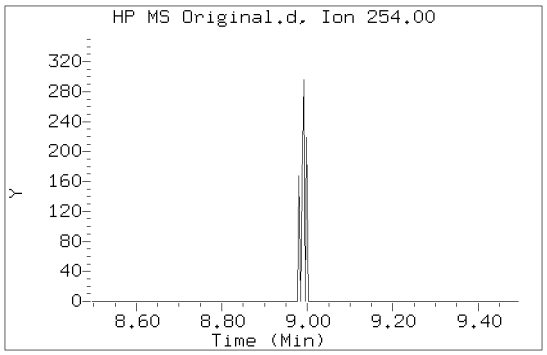
AFTER

MASS
175
AREA
775
HEIGHT
1033
17-Nov-2022
14:02
linh
pham



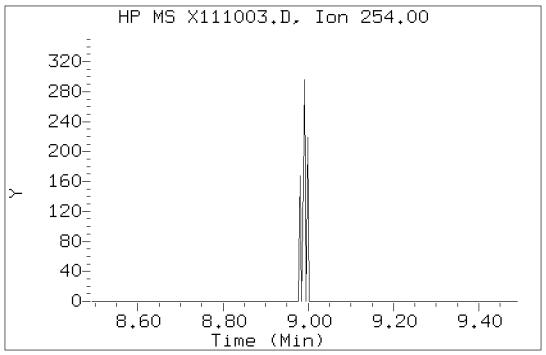
BEFORE

MASS
254
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
254
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

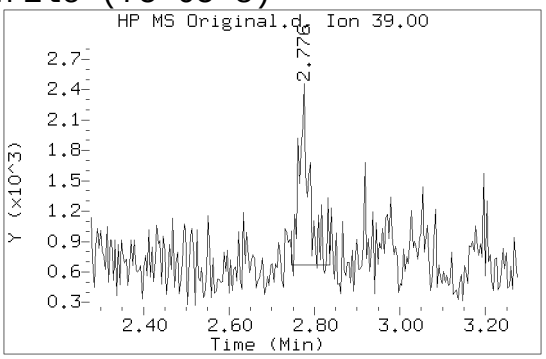


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

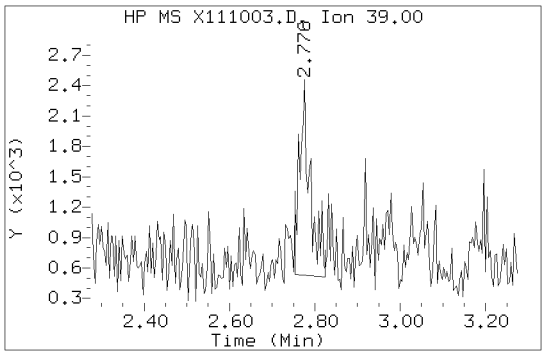
Acetonitrile (75-05-8)

Reason Code:

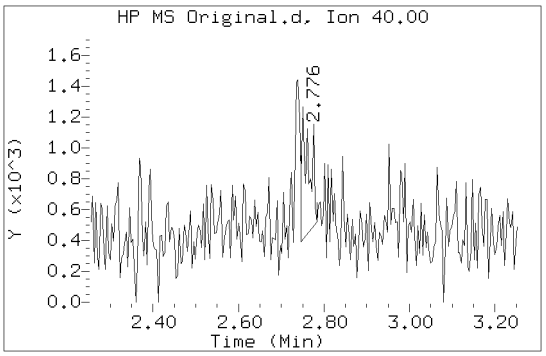
BEFORE
MASS
39
AREA
2925
HEIGHT
1786
17-Nov-2022
13:58
linh
pham



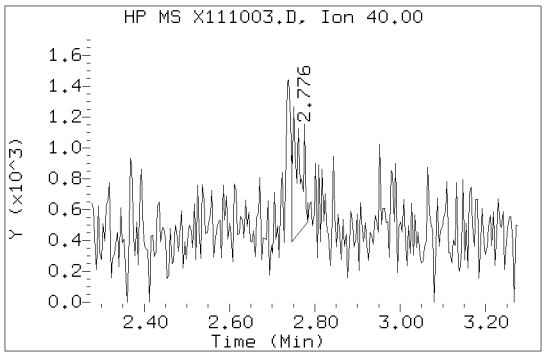
AFTER
MASS
39
AREA
3418
HEIGHT
1927
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
40
AREA
1012
HEIGHT
660
17-Nov-2022
13:58
linh
pham



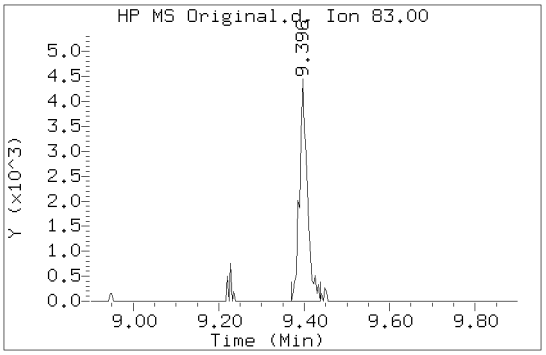
AFTER
MASS
40
AREA
1012
HEIGHT
660
17-Nov-2022
14:02
linh
pham



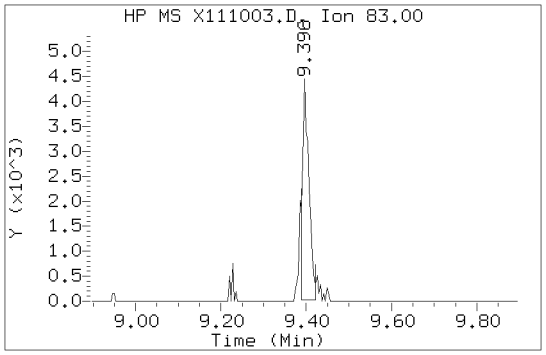
1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

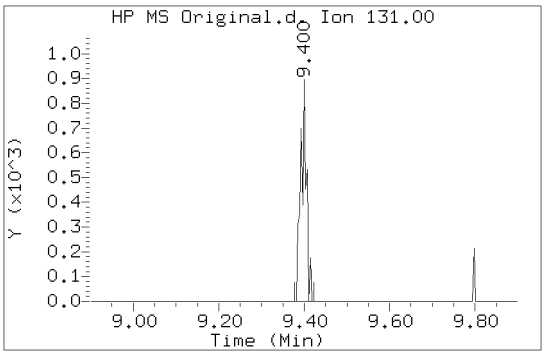
BEFORE
MASS
83
AREA
5815
HEIGHT
4449
17-Nov-2022
13:58
linh
pham



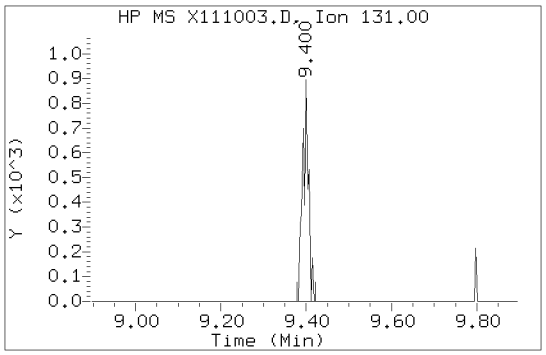
AFTER
MASS
83
AREA
4805
HEIGHT
4417
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
131
AREA
856
HEIGHT
895
17-Nov-2022
13:58
linh
pham



AFTER
MASS
131
AREA
856
HEIGHT
895
17-Nov-2022
14:02
linh
pham



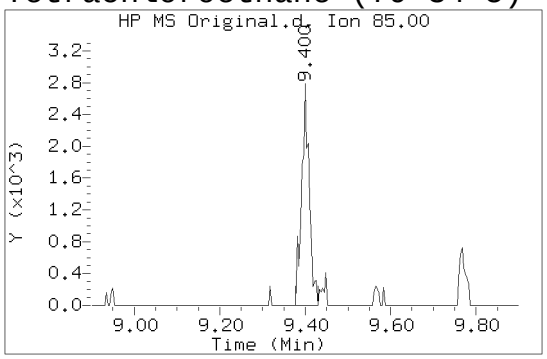
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

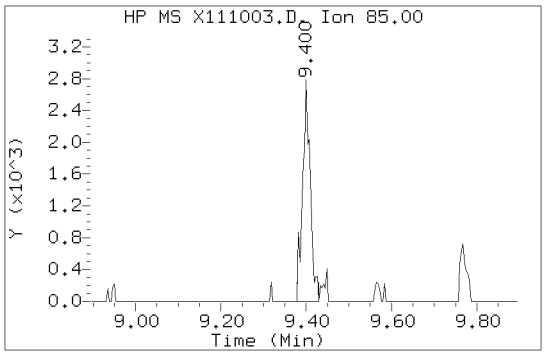
BEFORE

MASS
85
AREA
3545
HEIGHT
2787
17-Nov-2022
13:58
linh
pham



AFTER

MASS
85
AREA
3545
HEIGHT
2787
17-Nov-2022
14:02
linh
pham

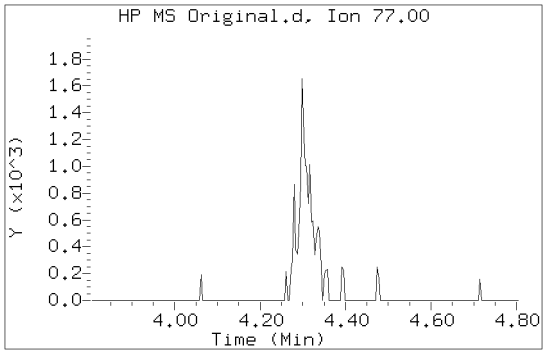


2,2-Dichloropropane (594-20-7)

Reason Code:

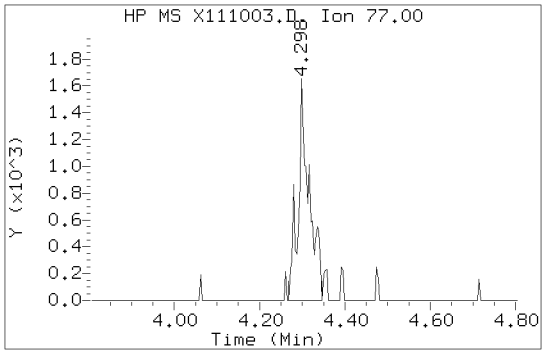
BEFORE

MASS
77
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



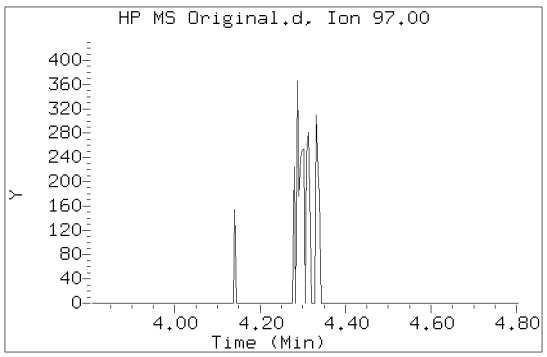
AFTER

MASS
77
AREA
3014
HEIGHT
1654
17-Nov-2022
14:02
linh
pham



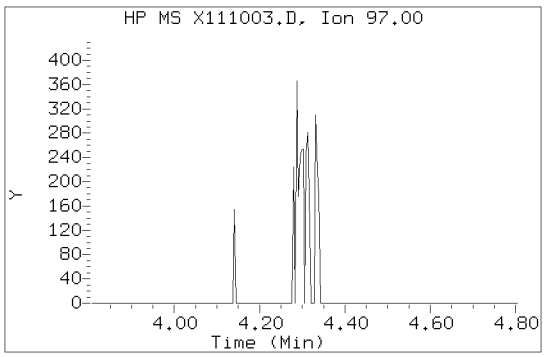
BEFORE

MASS
97
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

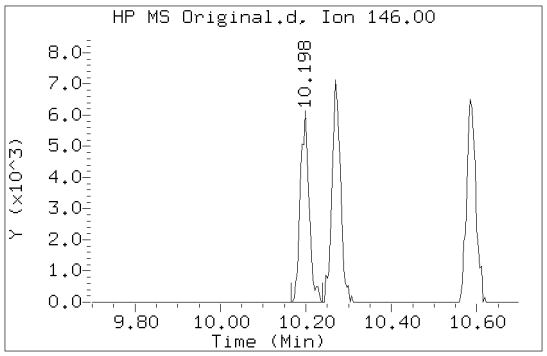


1,3-Dichlorobenzene (541-73-1)

Reason Code:

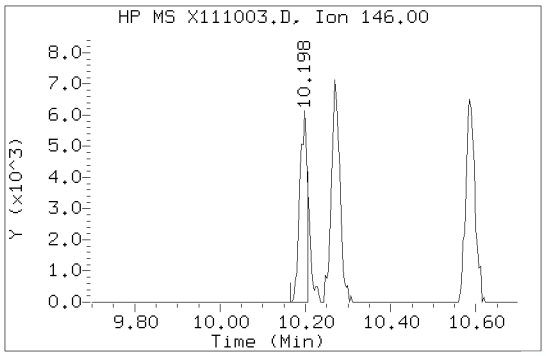
BEFORE

MASS
146
AREA
9004
HEIGHT
6151
17-Nov-2022
13:58
linh
pham



AFTER

MASS
146
AREA
7514
HEIGHT
6151
17-Nov-2022
14:02
linh
pham



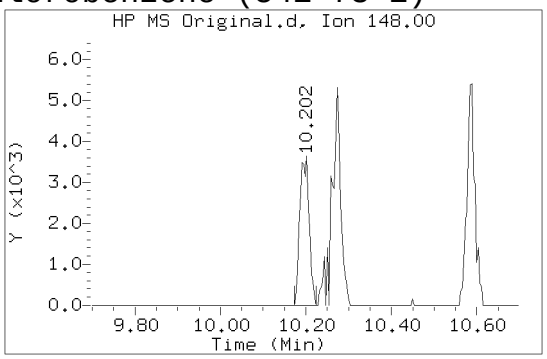
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,3-Dichlorobenzene (541-73-1)

Reason Code:

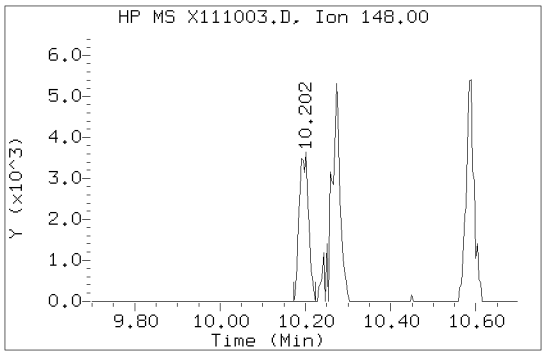
BEFORE

MASS
148
AREA
5646
HEIGHT
3652
17-Nov-2022
13:58
linh
pham



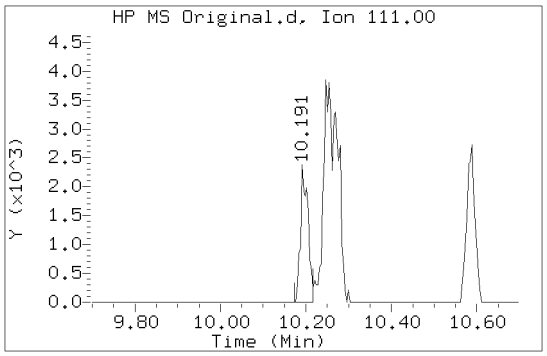
AFTER

MASS
148
AREA
5646
HEIGHT
3652
17-Nov-2022
14:02
linh
pham



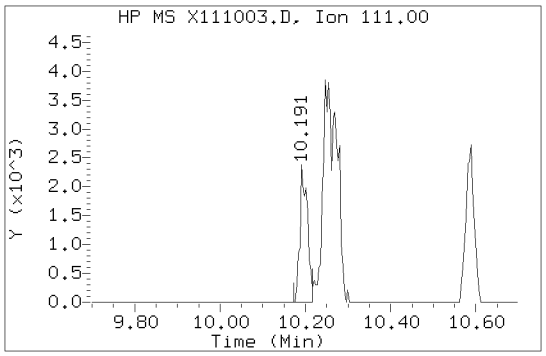
BEFORE

MASS
111
AREA
2990
HEIGHT
2381
17-Nov-2022
13:58
linh
pham



AFTER

MASS
111
AREA
2990
HEIGHT
2381
17-Nov-2022
14:02
linh
pham

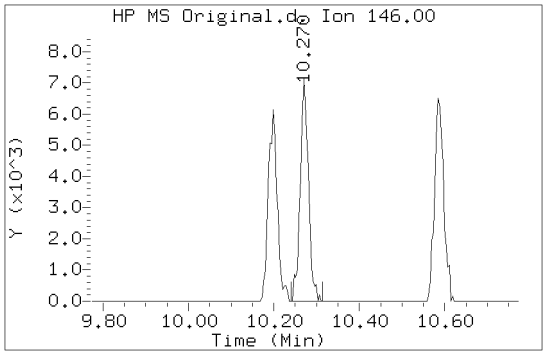


1,4-Dichlorobenzene (106-46-7)

Reason Code:

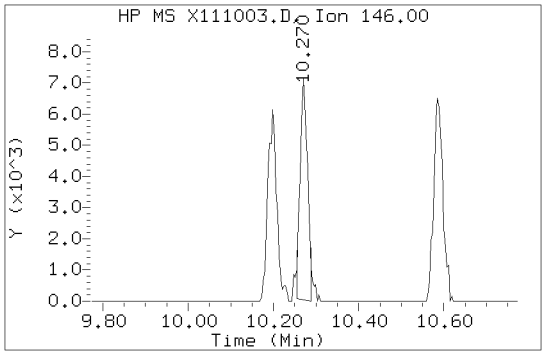
BEFORE

MASS
146
AREA
9863
HEIGHT
7130
17-Nov-2022
13:58
linh
pham



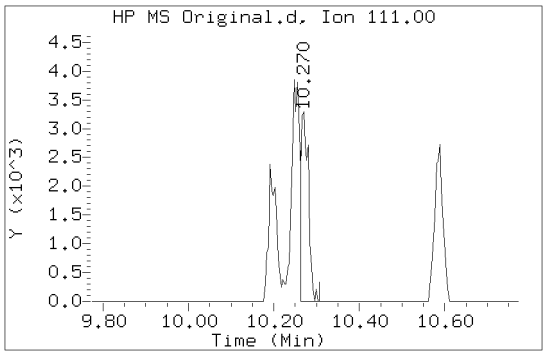
AFTER

MASS
146
AREA
8982
HEIGHT
7082
17-Nov-2022
14:02
linh
pham



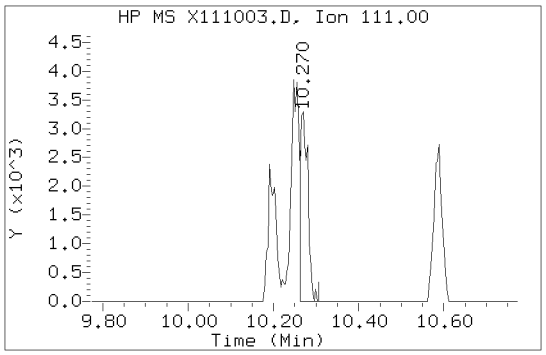
BEFORE

MASS
111
AREA
4212
HEIGHT
3299
17-Nov-2022
13:58
linh
pham



AFTER

MASS
111
AREA
4212
HEIGHT
3299
17-Nov-2022
14:02
linh
pham



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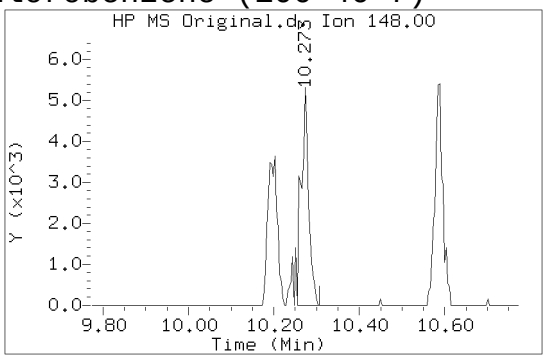
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,4-Dichlorobenzene (106-46-7)

Reason Code:

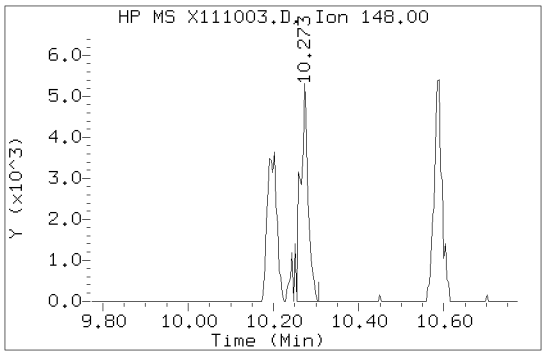
BEFORE

MASS
148
AREA
6616
HEIGHT
5316
17-Nov-2022
13:58
linh
pham



AFTER

MASS
148
AREA
6616
HEIGHT
5316
17-Nov-2022
14:02
linh
pham

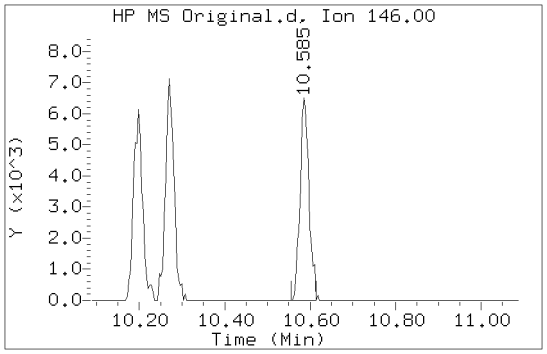


1,2-Dichlorobenzene (95-50-1)

Reason Code:

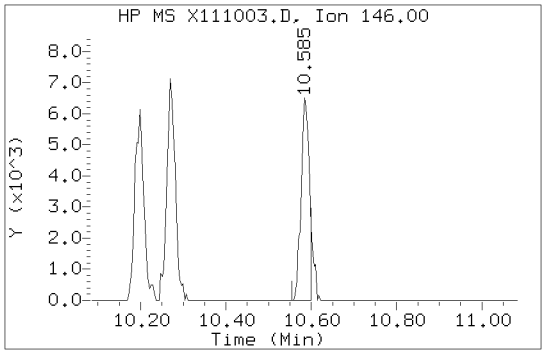
BEFORE

MASS
146
AREA
9713
HEIGHT
6506
17-Nov-2022
13:58
linh
pham



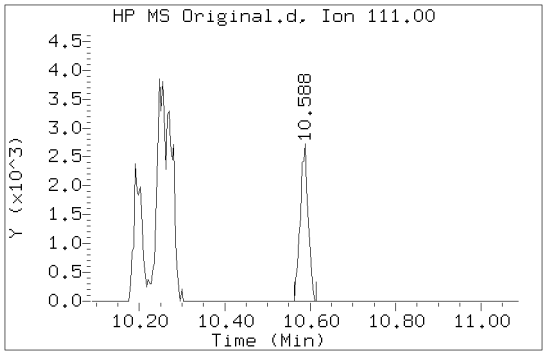
AFTER

MASS
146
AREA
8824
HEIGHT
6506
17-Nov-2022
14:02
linh
pham



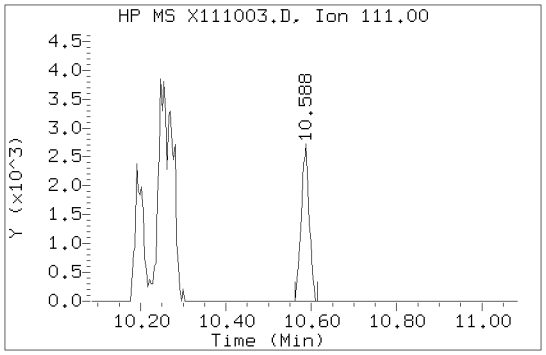
BEFORE

MASS
111
AREA
3642
HEIGHT
2729
17-Nov-2022
13:58
linh
pham



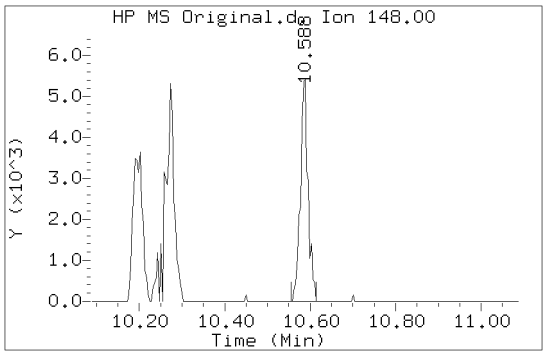
AFTER

MASS
111
AREA
3642
HEIGHT
2729
17-Nov-2022
14:02
linh
pham



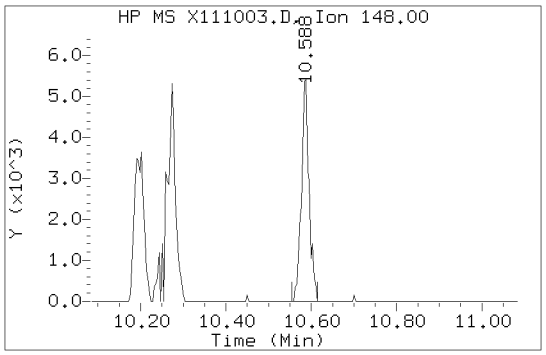
BEFORE

MASS
148
AREA
6969
HEIGHT
5409
17-Nov-2022
13:58
linh
pham



AFTER

MASS
148
AREA
6969
HEIGHT
5409
17-Nov-2022
14:02
linh
pham



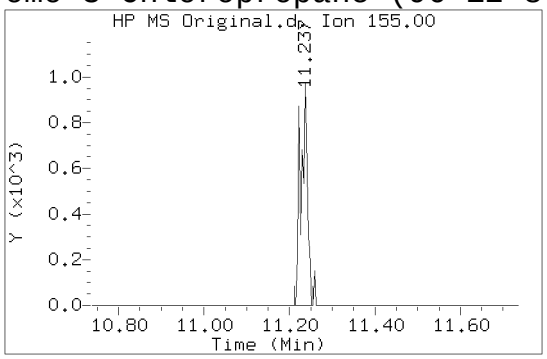
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

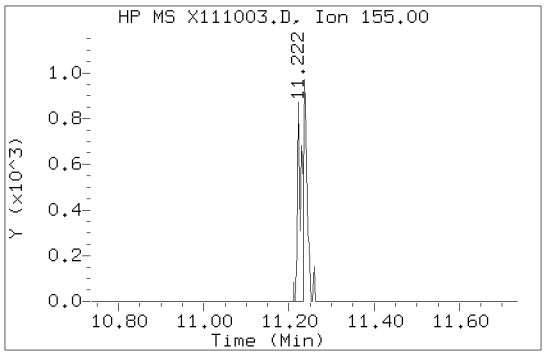
BEFORE

MASS
155
AREA
1095
HEIGHT
971
17-Nov-2022
13:58
linh
pham



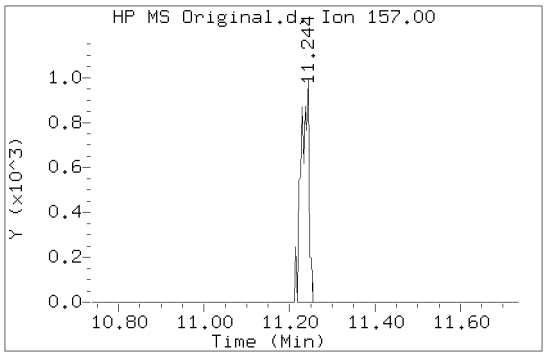
AFTER

MASS
155
AREA
587
HEIGHT
874
17-Nov-2022
14:02
linh
pham



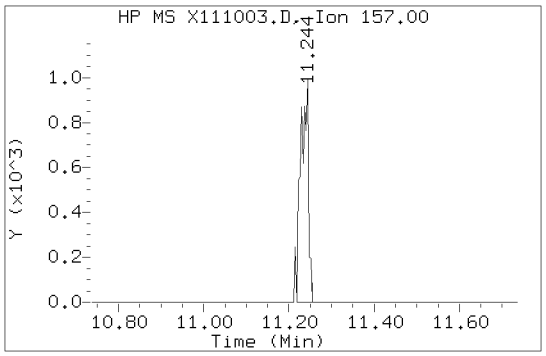
BEFORE

MASS
157
AREA
1263
HEIGHT
990
17-Nov-2022
13:58
linh
pham



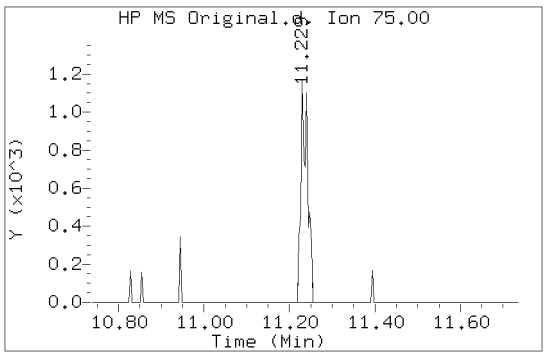
AFTER

MASS
157
AREA
1263
HEIGHT
990
17-Nov-2022
14:02
linh
pham



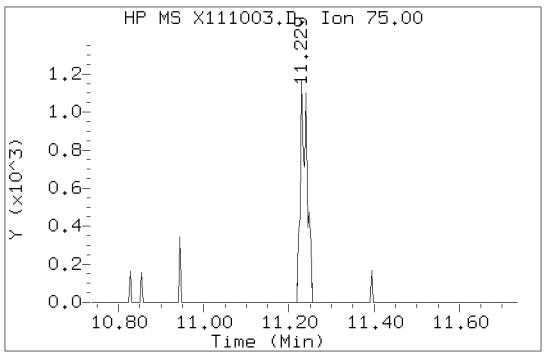
BEFORE

MASS
75
AREA
1283
HEIGHT
1165
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
1283
HEIGHT
1165
17-Nov-2022
14:02
linh
pham

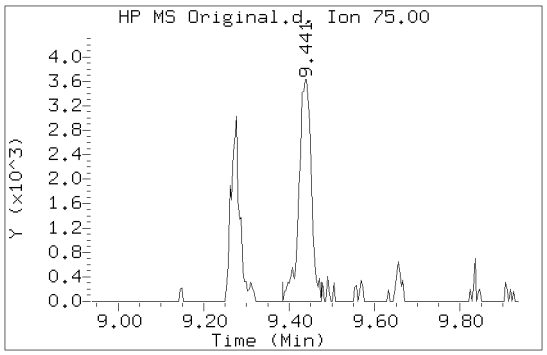


1,2,3-Trichloropropane (96-18-4)

Reason Code:

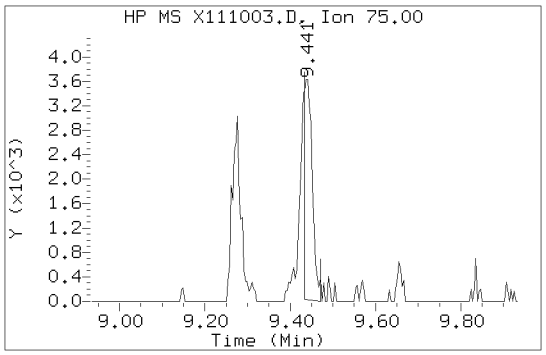
BEFORE

MASS
75
AREA
7455
HEIGHT
3627
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
4794
HEIGHT
3600
17-Nov-2022
14:02
linh
pham



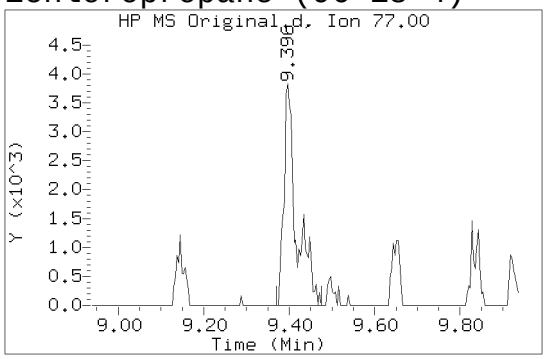
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,2,3-Trichloropropane (96-18-4)

Reason Code:

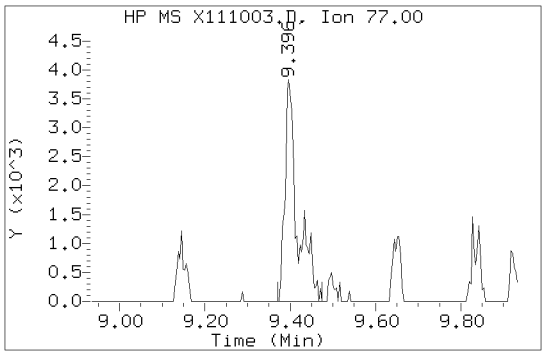
BEFORE

MASS
77
AREA
7784
HEIGHT
3831
17-Nov-2022
13:58
linh
pham



AFTER

MASS
77
AREA
7784
HEIGHT
3831
17-Nov-2022
14:02
linh
pham

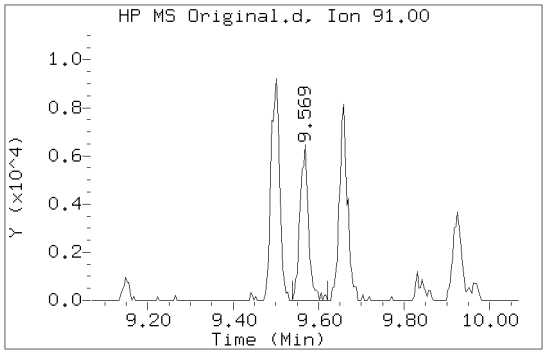


2-Chlorotoluene (95-49-8)

Reason Code:

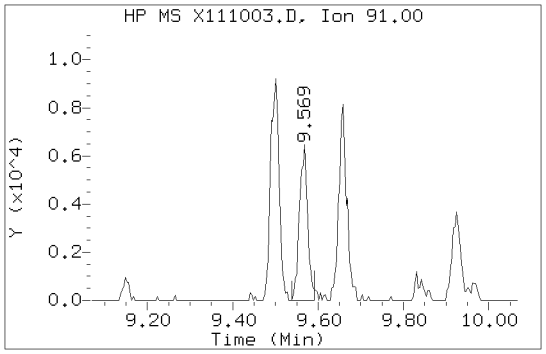
BEFORE

MASS
91
AREA
9261
HEIGHT
6464
17-Nov-2022
13:58
linh
pham



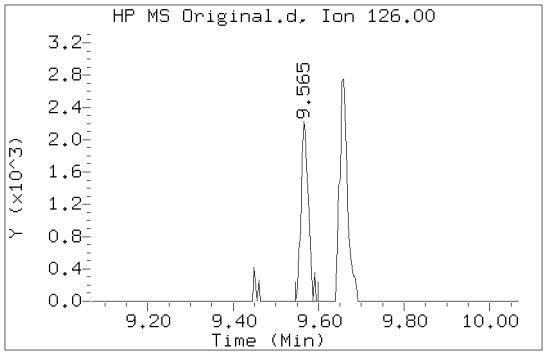
AFTER

MASS
91
AREA
8907
HEIGHT
6464
17-Nov-2022
14:02
linh
pham



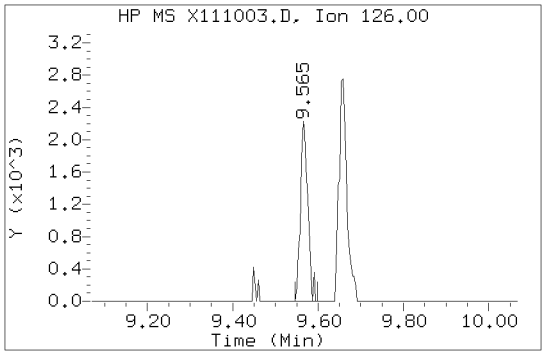
BEFORE

MASS
126
AREA
2759
HEIGHT
2226
17-Nov-2022
13:58
linh
pham



AFTER

MASS
126
AREA
2759
HEIGHT
2226
17-Nov-2022
14:02
linh
pham

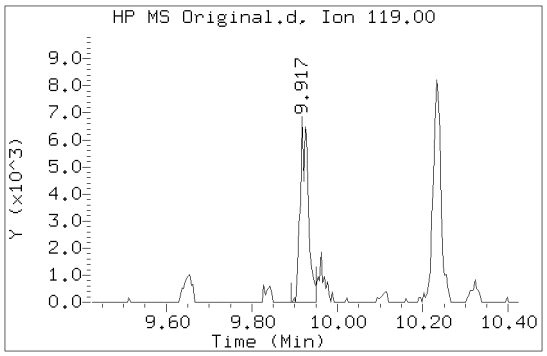


tert-Butylbenzene (98-06-6)

Reason Code:

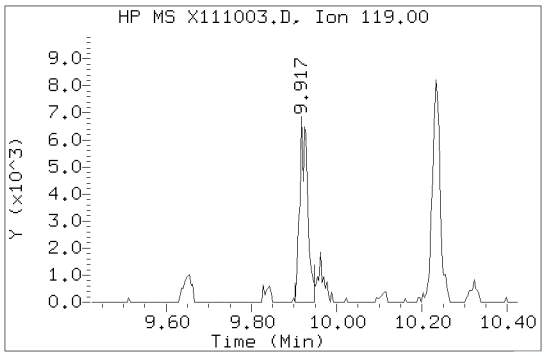
BEFORE

MASS
119
AREA
9209
HEIGHT
6869
17-Nov-2022
13:58
linh
pham



AFTER

MASS
119
AREA
9035
HEIGHT
6869
17-Nov-2022
14:02
linh
pham



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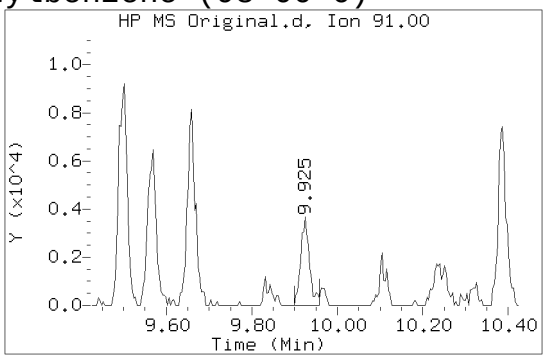
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

tert-Butylbenzene (98-06-6)

Reason Code:

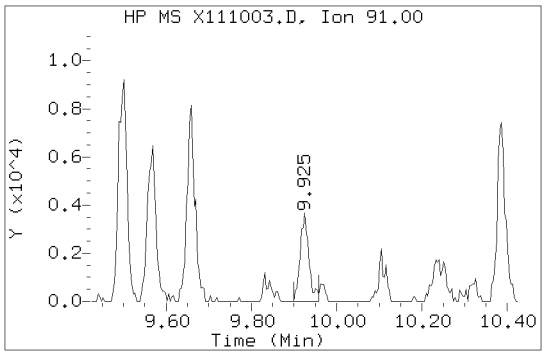
BEFORE

MASS
91
AREA
5354
HEIGHT
3683
17-Nov-2022
13:58
linh
pham



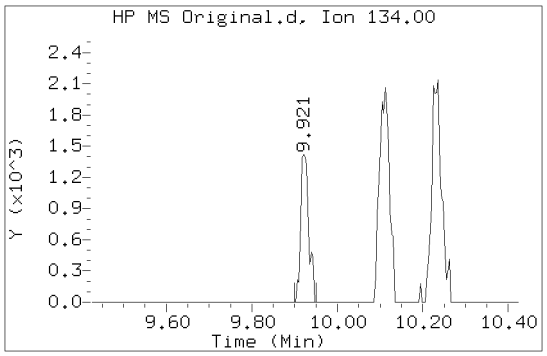
AFTER

MASS
91
AREA
5354
HEIGHT
3683
17-Nov-2022
14:02
linh
pham



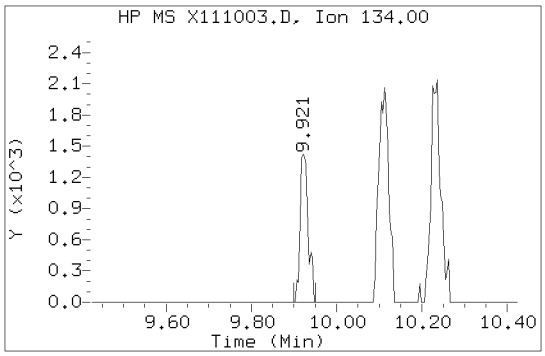
BEFORE

MASS
134
AREA
1955
HEIGHT
1419
17-Nov-2022
13:58
linh
pham



AFTER

MASS
134
AREA
1955
HEIGHT
1419
17-Nov-2022
14:02
linh
pham

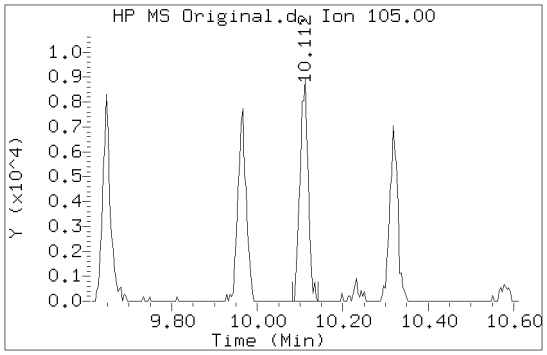


sec-Butylbenzene (135-98-8)

Reason Code:

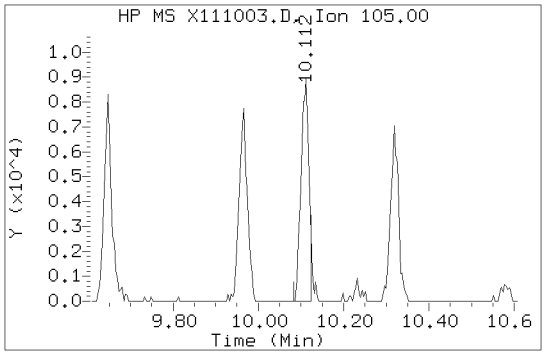
BEFORE

MASS
105
AREA
12258
HEIGHT
8926
17-Nov-2022
13:58
linh
pham



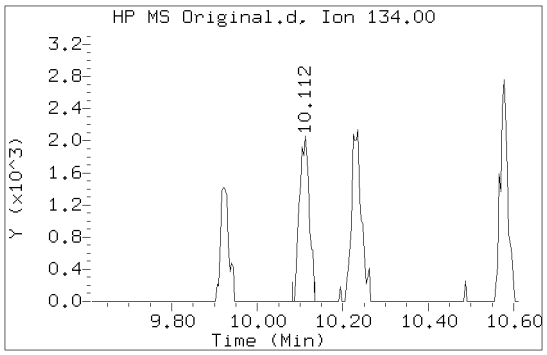
AFTER

MASS
105
AREA
11718
HEIGHT
8926
17-Nov-2022
14:02
linh
pham



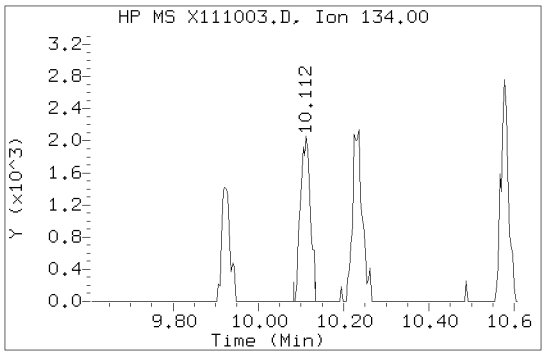
BEFORE

MASS
134
AREA
3391
HEIGHT
2063
17-Nov-2022
13:58
linh
pham



AFTER

MASS
134
AREA
3391
HEIGHT
2063
17-Nov-2022
14:02
linh
pham



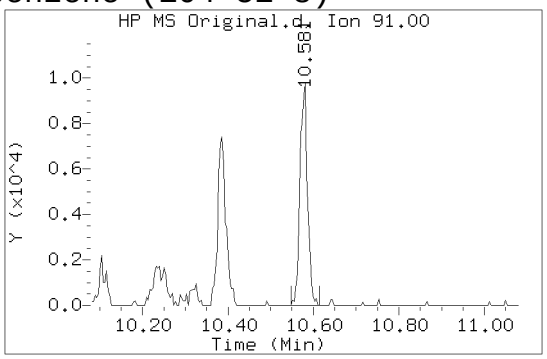
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

n-Butylbenzene (104-51-8)

Reason Code:

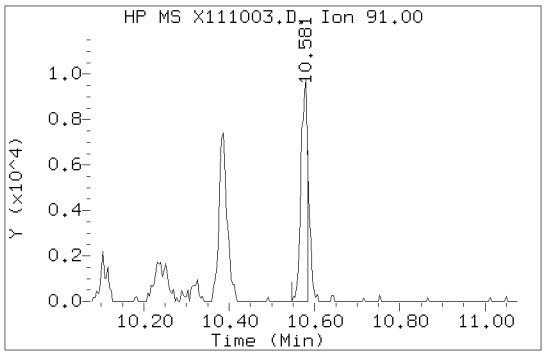
BEFORE

MASS
91
AREA
12348
HEIGHT
9753
17-Nov-2022
13:58
linh
pham



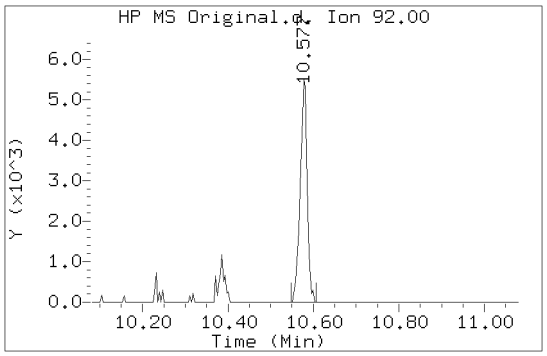
AFTER

MASS
91
AREA
10473
HEIGHT
9753
17-Nov-2022
14:02
linh
pham



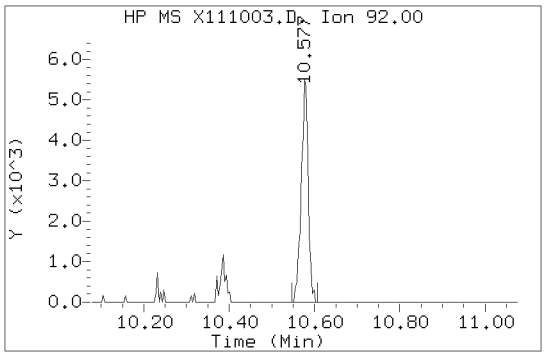
BEFORE

MASS
92
AREA
6470
HEIGHT
5493
17-Nov-2022
13:58
linh
pham



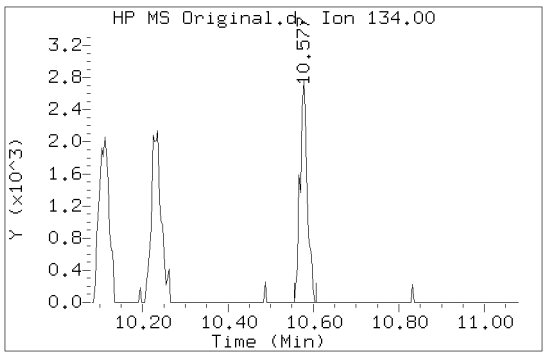
AFTER

MASS
92
AREA
6470
HEIGHT
5493
17-Nov-2022
14:02
linh
pham



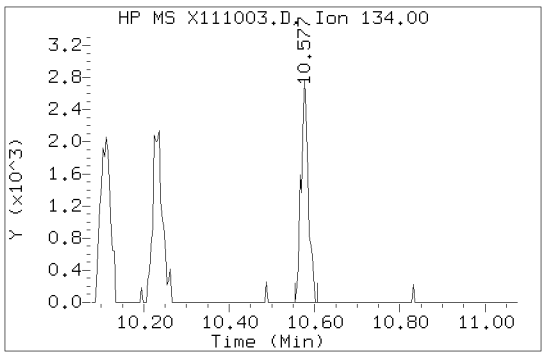
BEFORE

MASS
134
AREA
3388
HEIGHT
2761
17-Nov-2022
13:58
linh
pham



AFTER

MASS
134
AREA
3388
HEIGHT
2761
17-Nov-2022
14:02
linh
pham

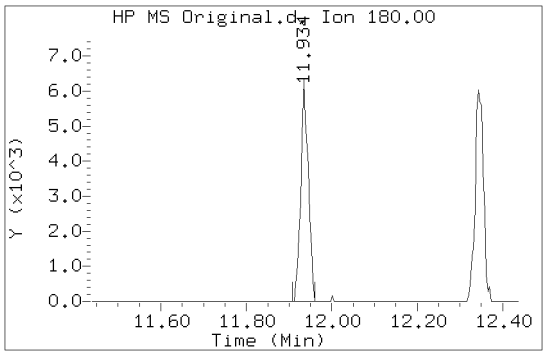


1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

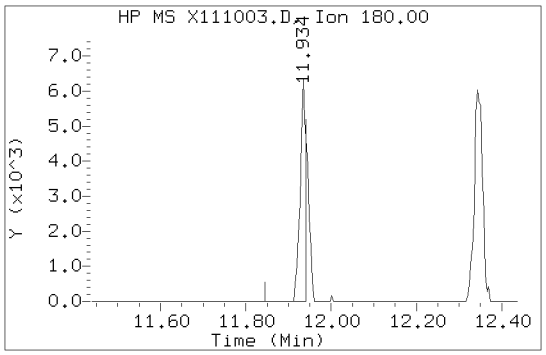
BEFORE

MASS
180
AREA
7977
HEIGHT
6324
17-Nov-2022
13:58
linh
pham



AFTER

MASS
180
AREA
6080
HEIGHT
6324
17-Nov-2022
14:02
linh
pham



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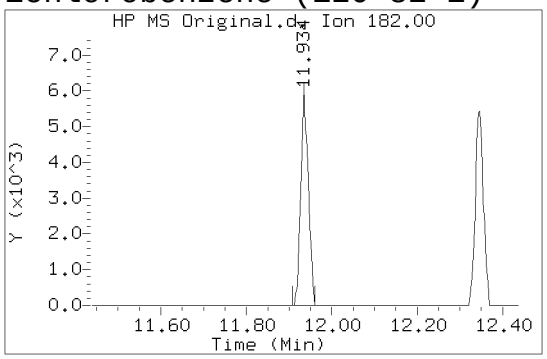
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

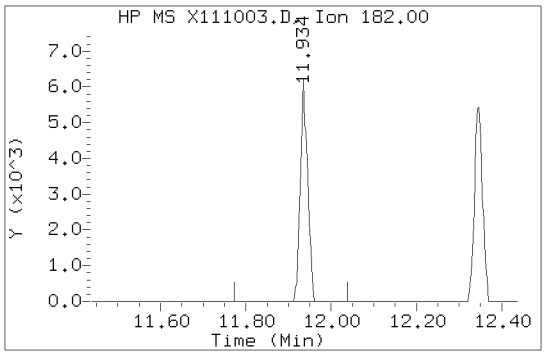
1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

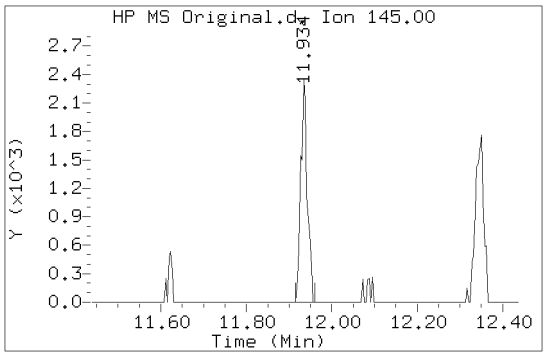
BEFORE
MASS
182
AREA
7608
HEIGHT
6203
17-Nov-2022
13:58
linh
pham



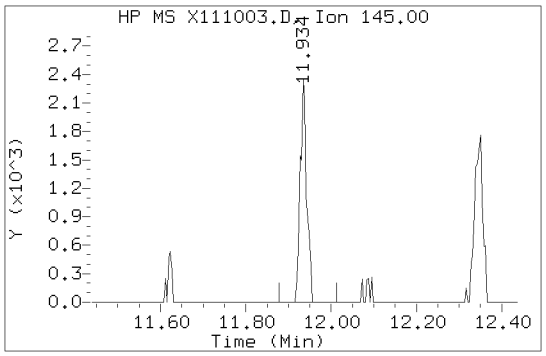
AFTER
MASS
182
AREA
7608
HEIGHT
6203
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
145
AREA
2567
HEIGHT
2343
17-Nov-2022
13:58
linh
pham



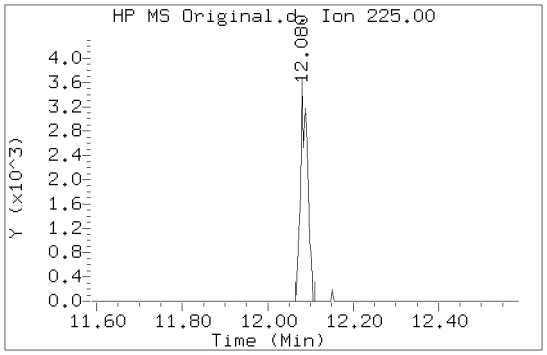
AFTER
MASS
145
AREA
2567
HEIGHT
2343
17-Nov-2022
14:02
linh
pham



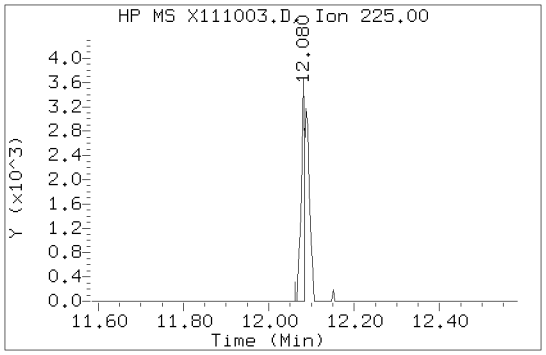
Hexachlorobutadiene (87-68-3)

Reason Code:

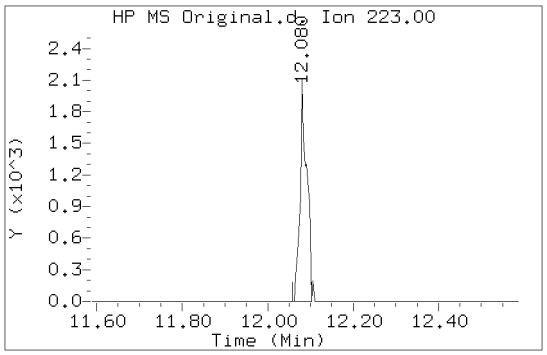
BEFORE
MASS
225
AREA
4329
HEIGHT
3659
17-Nov-2022
13:58
linh
pham



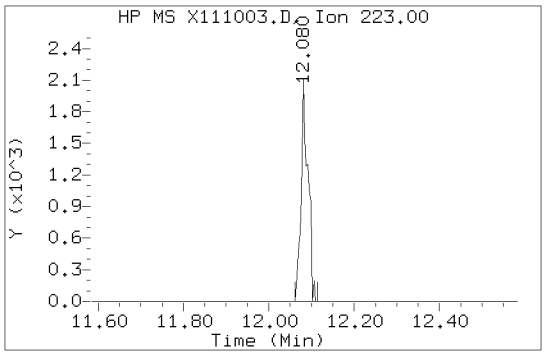
AFTER
MASS
225
AREA
2181
HEIGHT
3659
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
223
AREA
2385
HEIGHT
2104
17-Nov-2022
13:58
linh
pham



AFTER
MASS
223
AREA
2428
HEIGHT
2104
17-Nov-2022
14:02
linh
pham



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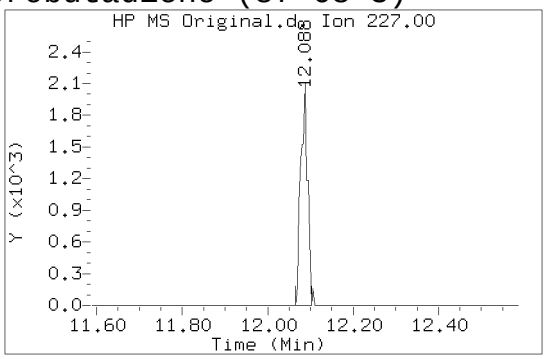
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Hexachlorobutadiene (87-68-3)

Reason Code:

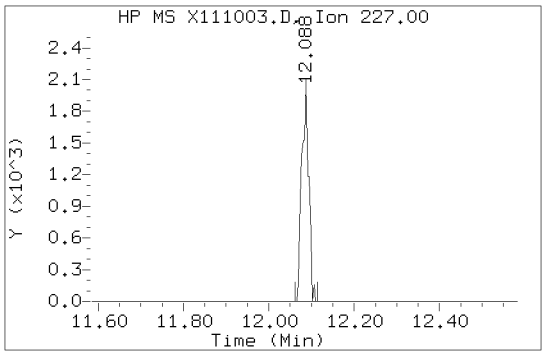
BEFORE

MASS
227
AREA
2399
HEIGHT
2099
17-Nov-2022
13:58
linh
pham



AFTER

MASS
227
AREA
2435
HEIGHT
2099
17-Nov-2022
14:02
linh
pham

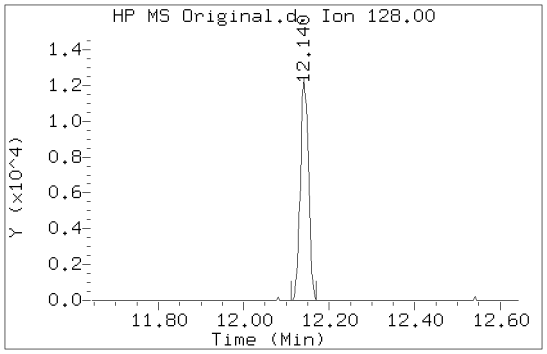


Naphthalene (91-20-3)

Reason Code:

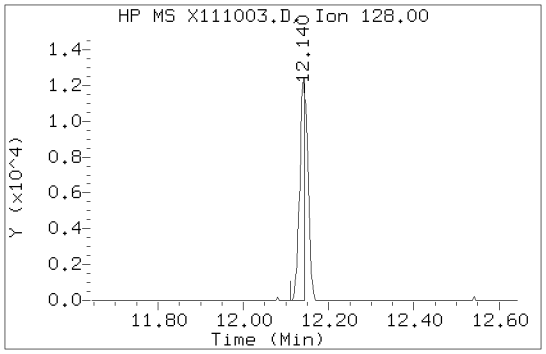
BEFORE

MASS
128
AREA
17053
HEIGHT
12384
17-Nov-2022
13:58
linh
pham



AFTER

MASS
128
AREA
11034
HEIGHT
12384
17-Nov-2022
14:02
linh
pham

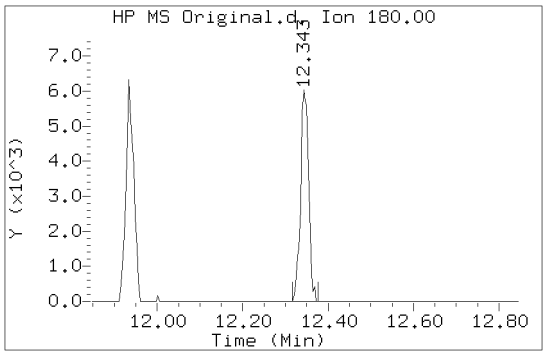


1,2,3-Trichlorobenzene (87-61-6)

Reason Code:

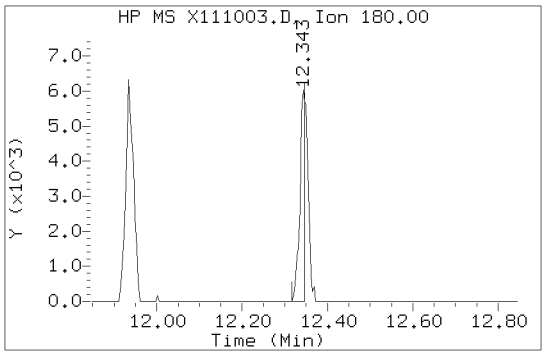
BEFORE

MASS
180
AREA
8228
HEIGHT
6040
17-Nov-2022
13:58
linh
pham



AFTER

MASS
180
AREA
5222
HEIGHT
6040
17-Nov-2022
14:02
linh
pham

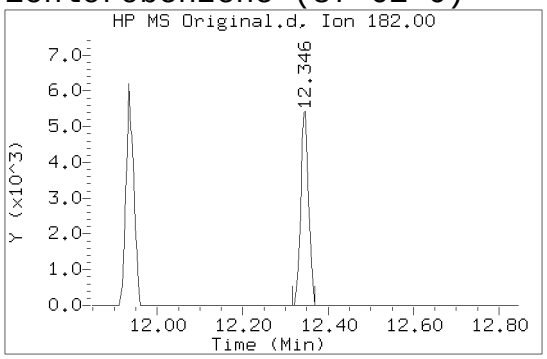


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

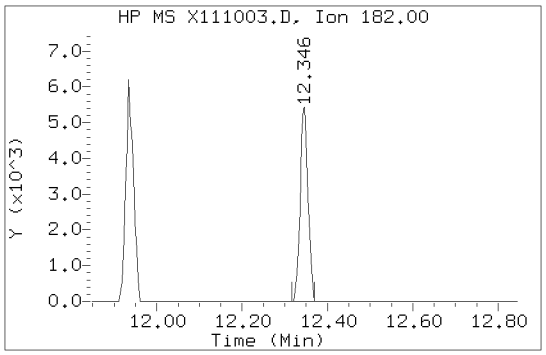
1,2,3-Trichlorobenzene (87-61-6)

Reason Code:

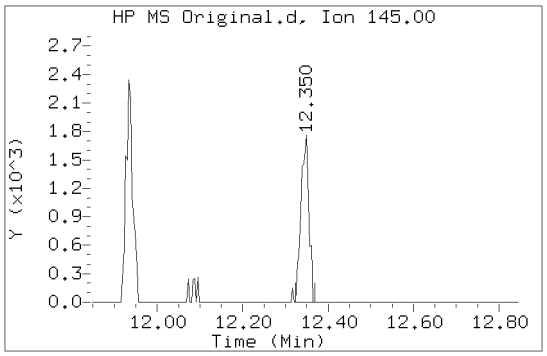
BEFORE
MASS
182
AREA
7198
HEIGHT
5438
17-Nov-2022
13:58
linh
pham



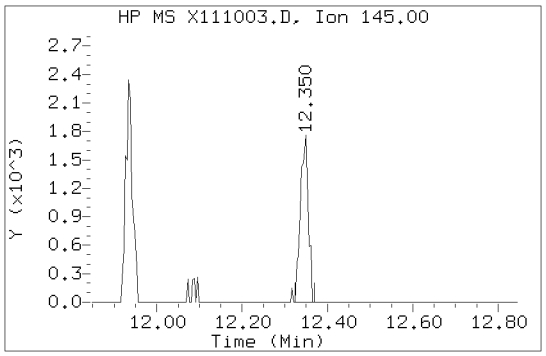
AFTER
MASS
182
AREA
7198
HEIGHT
5438
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
145
AREA
2333
HEIGHT
1759
17-Nov-2022
13:58
linh
pham



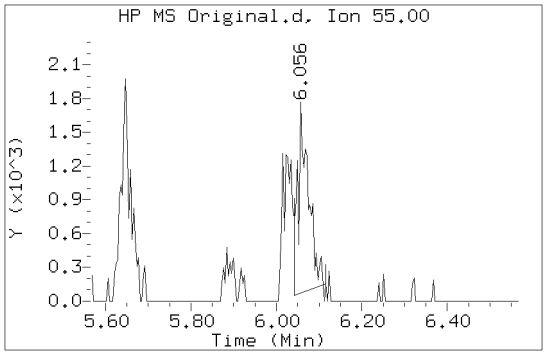
AFTER
MASS
145
AREA
2333
HEIGHT
1759
17-Nov-2022
14:02
linh
pham



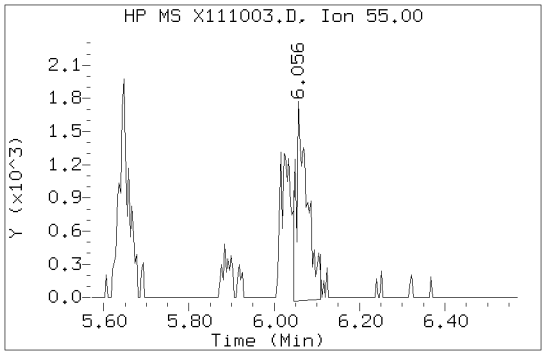
Methylcyclohexane (108-87-2)

Reason Code:

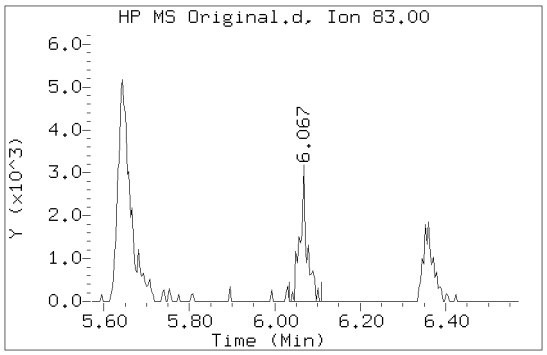
BEFORE
MASS
55
AREA
3009
HEIGHT
1702
17-Nov-2022
13:58
linh
pham



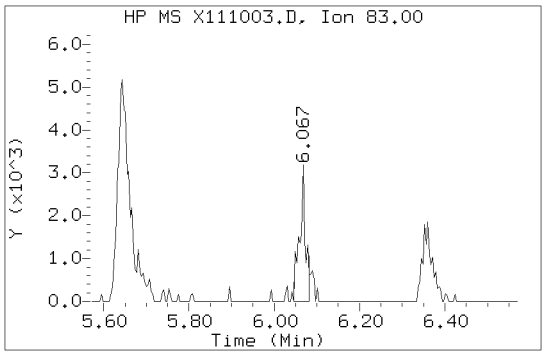
AFTER
MASS
55
AREA
3395
HEIGHT
1804
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
83
AREA
3678
HEIGHT
3191
17-Nov-2022
13:58
linh
pham



AFTER
MASS
83
AREA
3136
HEIGHT
3191
17-Nov-2022
14:02
linh
pham



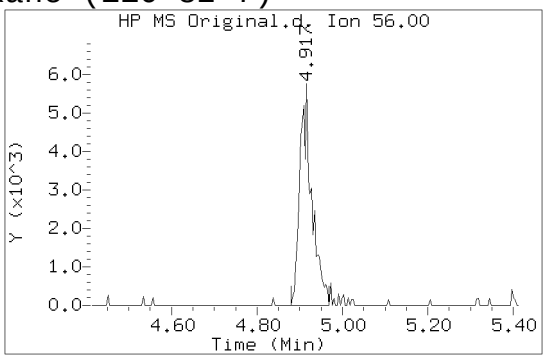
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Cyclohexane (110-82-7)

Reason Code:

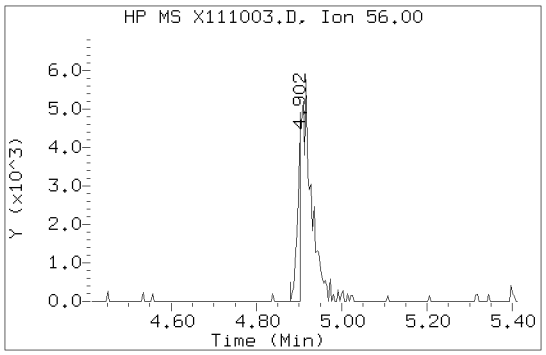
BEFORE

MASS
56
AREA
11267
HEIGHT
5762
17-Nov-2022
13:58
linh
pham



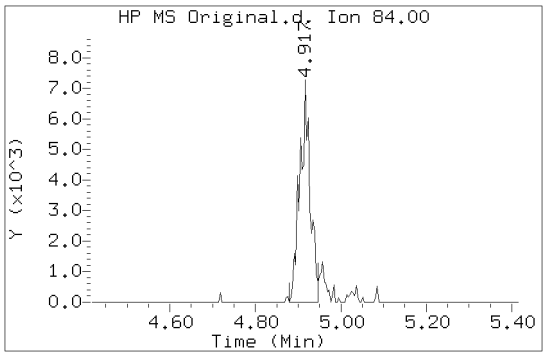
AFTER

MASS
56
AREA
2342
HEIGHT
4409
17-Nov-2022
14:02
linh
pham



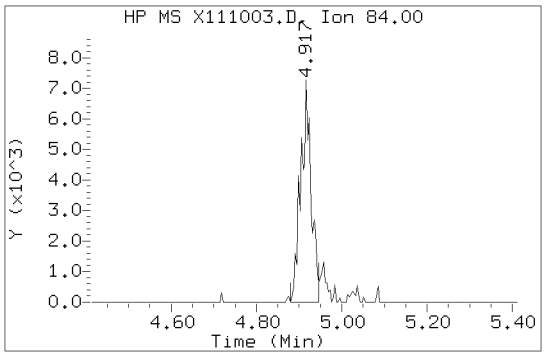
BEFORE

MASS
84
AREA
12453
HEIGHT
7280
17-Nov-2022
13:58
linh
pham



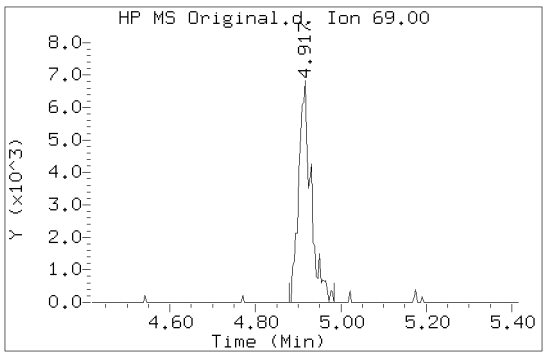
AFTER

MASS
84
AREA
12453
HEIGHT
7280
17-Nov-2022
14:02
linh
pham



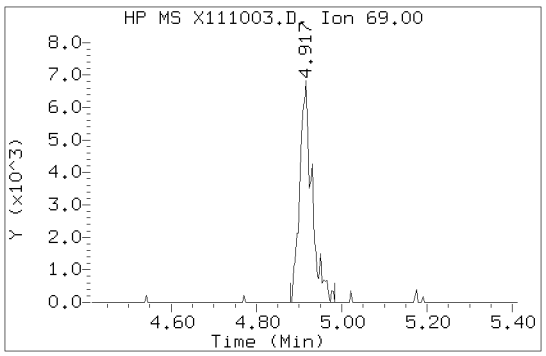
BEFORE

MASS
69
AREA
13882
HEIGHT
6825
17-Nov-2022
13:58
linh
pham



AFTER

MASS
69
AREA
13882
HEIGHT
6825
17-Nov-2022
14:02
linh
pham

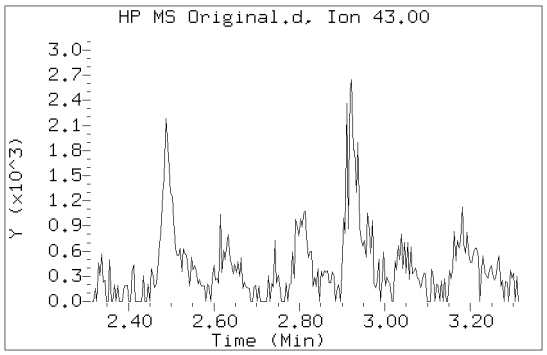


Methyl Acetate (79-20-9)

Reason Code:

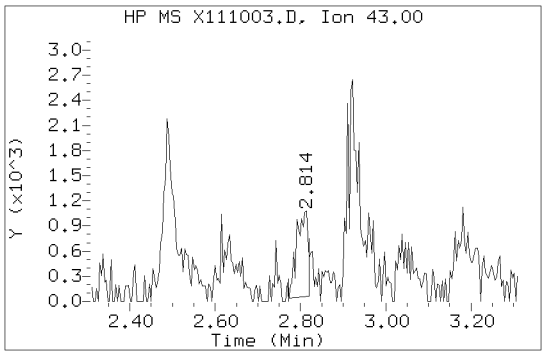
BEFORE

MASS
43
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
43
AREA
1924
HEIGHT
1020
17-Nov-2022
14:02
linh
pham



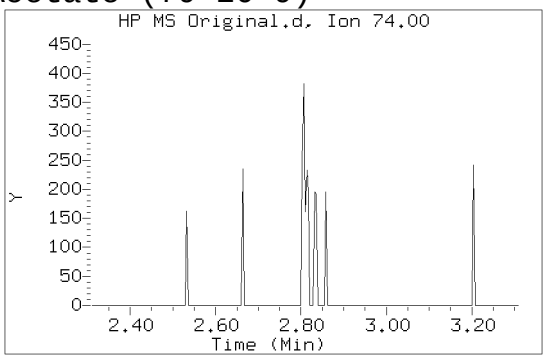
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

Methyl Acetate (79-20-9)

Reason Code:

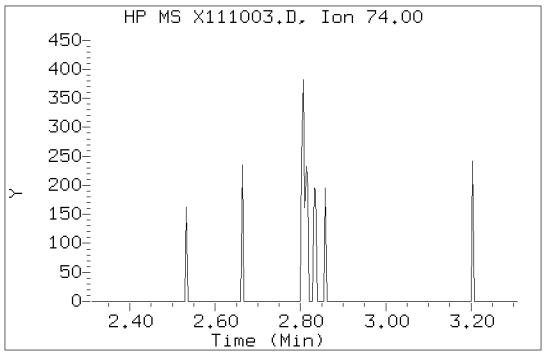
BEFORE

MASS
74
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
74
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

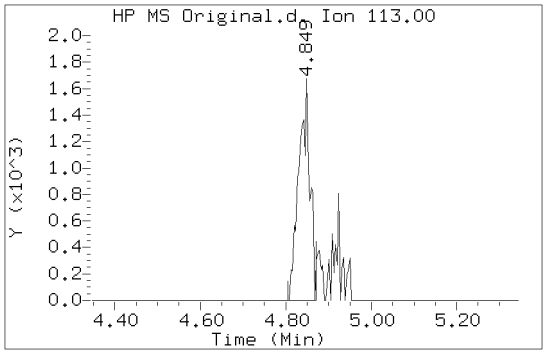


Dibromofluoromethane (1868-53-7)

Reason Code:

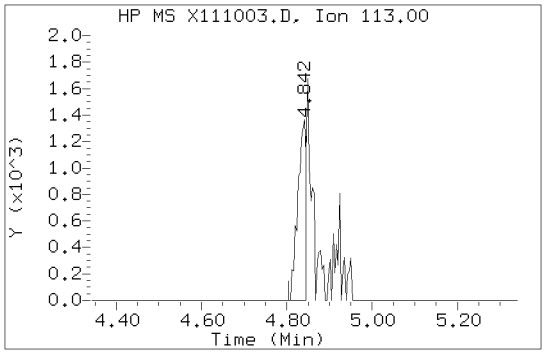
BEFORE

MASS
113
AREA
3113
HEIGHT
1675
17-Nov-2022
13:58
linh
pham



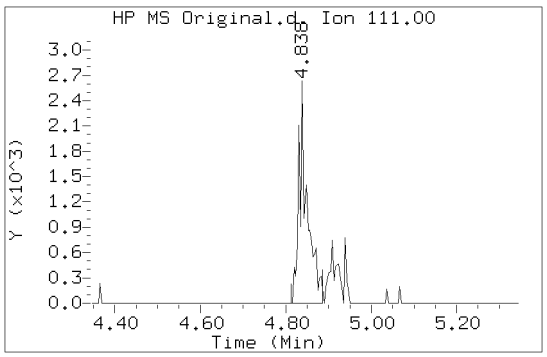
AFTER

MASS
113
AREA
1897
HEIGHT
1366
17-Nov-2022
14:02
linh
pham



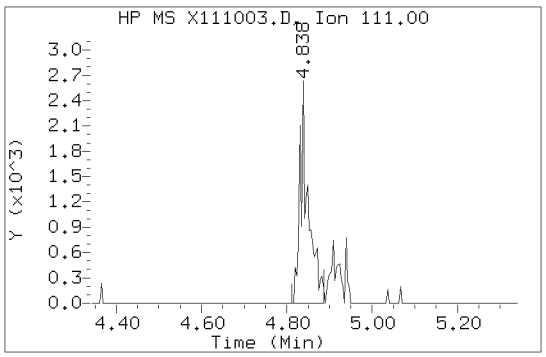
BEFORE

MASS
111
AREA
3582
HEIGHT
2634
17-Nov-2022
13:58
linh
pham



AFTER

MASS
111
AREA
3582
HEIGHT
2634
17-Nov-2022
14:02
linh
pham

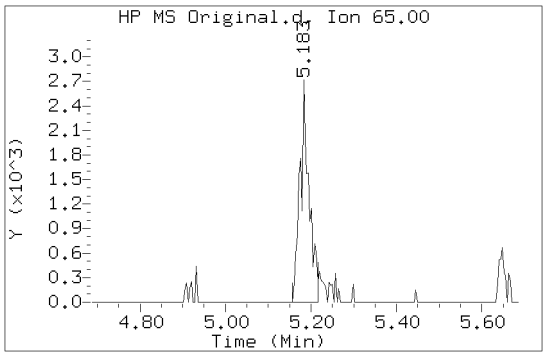


1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

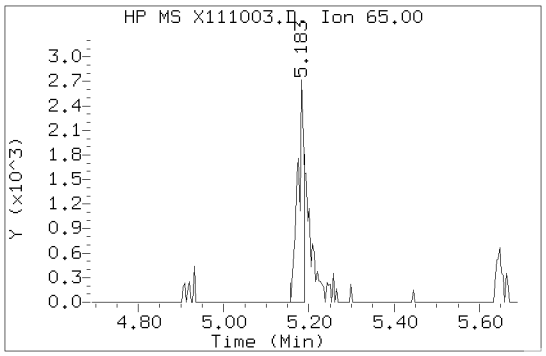
BEFORE

MASS
65
AREA
4070
HEIGHT
2718
17-Nov-2022
13:58
linh
pham



AFTER

MASS
65
AREA
2782
HEIGHT
2718
17-Nov-2022
14:02
linh
pham



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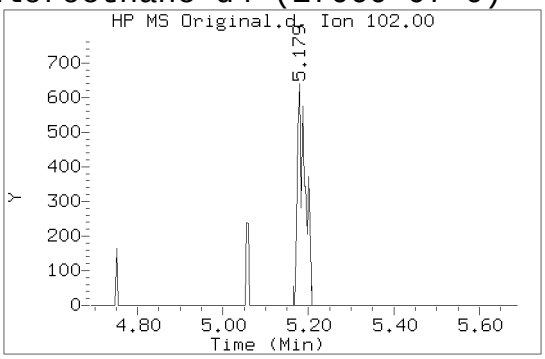
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

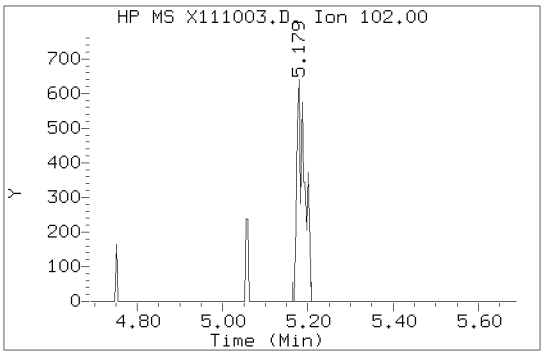
BEFORE

MASS
102
AREA
822
HEIGHT
640
17-Nov-2022
13:58
linh
pham



AFTER

MASS
102
AREA
822
HEIGHT
640
17-Nov-2022
14:02
linh
pham

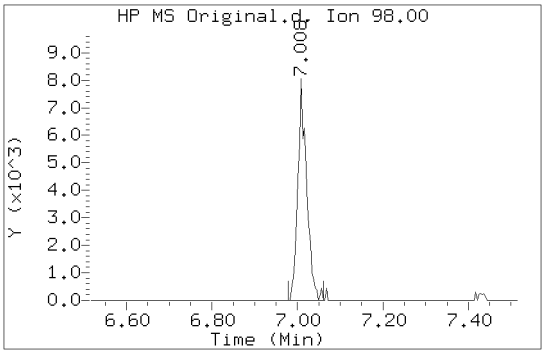


Toluene-d8 (2037-26-5)

Reason Code:

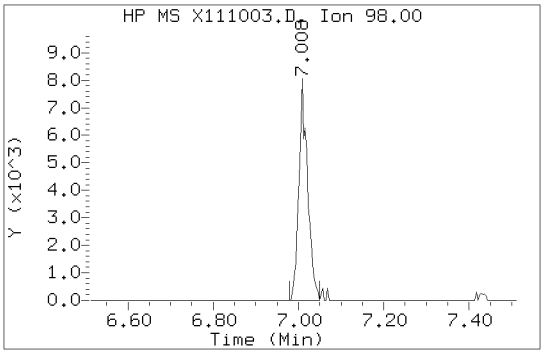
BEFORE

MASS
98
AREA
11858
HEIGHT
8058
17-Nov-2022
13:58
linh
pham



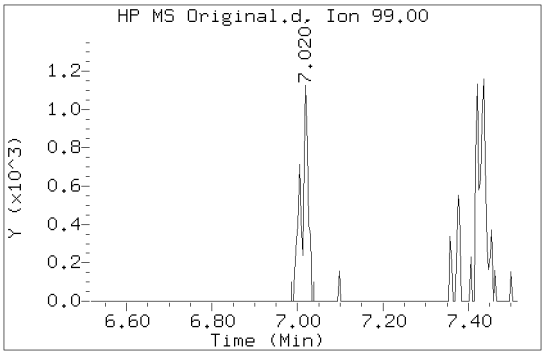
AFTER

MASS
98
AREA
11710
HEIGHT
8058
17-Nov-2022
14:02
linh
pham



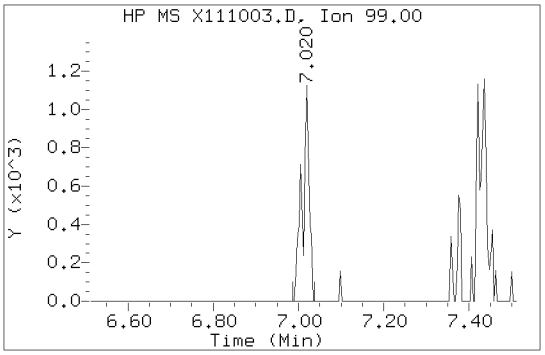
BEFORE

MASS
99
AREA
1274
HEIGHT
1126
17-Nov-2022
13:58
linh
pham



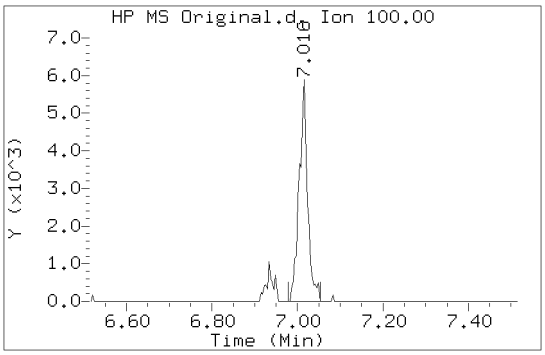
AFTER

MASS
99
AREA
1274
HEIGHT
1126
17-Nov-2022
14:02
linh
pham



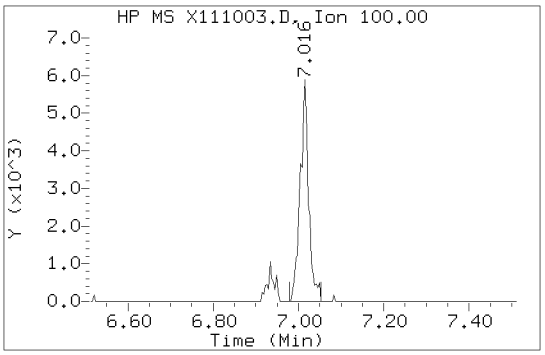
BEFORE

MASS
100
AREA
8328
HEIGHT
5891
17-Nov-2022
13:58
linh
pham



AFTER

MASS
100
AREA
8328
HEIGHT
5891
17-Nov-2022
14:02
linh
pham



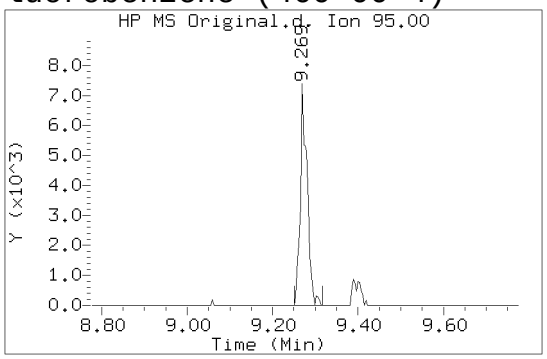
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111003.D
Inj Date : 10-NOV-2022 13:34
InstruID : voa10.i
LabSampID : VSTD000.5

4-Bromofluorobenzene (460-00-4)

Reason Code:

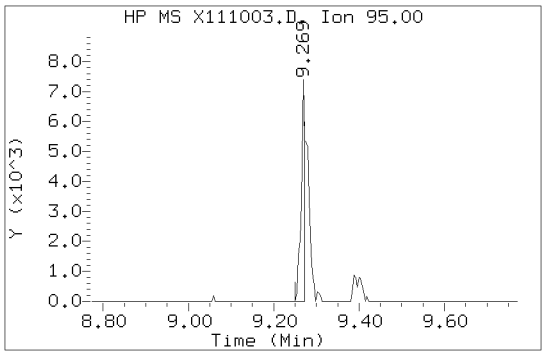
BEFORE

MASS
95
AREA
8491
HEIGHT
7394
17-Nov-2022
13:58
linh
pham



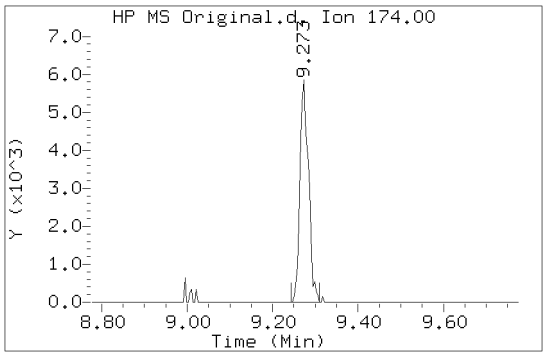
AFTER

MASS
95
AREA
4486
HEIGHT
7394
17-Nov-2022
14:02
linh
pham



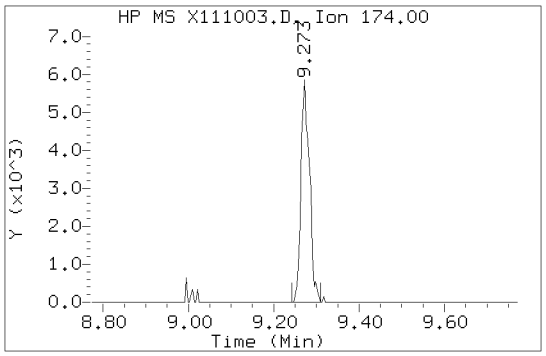
BEFORE

MASS
174
AREA
8407
HEIGHT
5856
17-Nov-2022
13:58
linh
pham



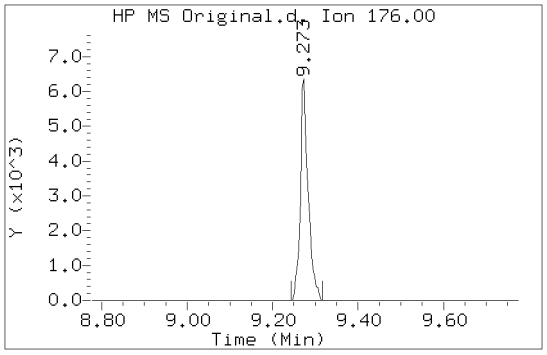
AFTER

MASS
174
AREA
8407
HEIGHT
5856
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
176
AREA
8307
HEIGHT
6366
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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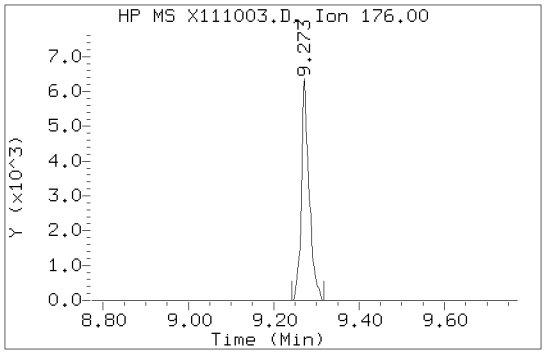
HEIGHT
6366
17-Nov-2022
14:02
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D Page 1
Report Date: 17-Nov-2022 14:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 10-NOV-2022 14:15
Operator : FT Inst ID: voa10.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : V10;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:02 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 13:34 Cal File: X111003.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	289017	50.0000	
2 Dichlorodifluoromethane	85	1.231	1.231	(0.251)	2485	1.00000	1.00(M)
3 Chloromethane	50	1.370	1.370	(0.279)	2863	1.00000	1.06(M)
5 Vinyl Chloride	62	1.452	1.452	(0.295)	2740	1.00000	1.02(M)
6 Bromomethane	94	1.700	1.700	(0.346)	1316	1.00000	1.08(M)
7 Chloroethane	64	1.786	1.786	(0.363)	1575	1.00000	1.01(M)
8 Trichlorofluoromethane	101	1.992	1.992	(0.405)	3422	1.00000	0.97(M)
9 Acrolein	56	2.348	2.348	(0.478)	293	2.00000	0.78(M)
10 Acetone	43	2.487	2.487	(0.506)	4443	2.00000	(M)
12 Isobutyl Alcohol	43	5.377	5.377	(1.094)	8744	20.0000	19.40
13 Acetonitrile	39	2.776	2.776	(0.565)	5065	10.0000	12.52(M)
16 Acrylonitrile	53	3.143	3.143	(0.639)	2238	2.00000	2.09(M)
11 1,1-Dichloroethene	96	2.434	2.434	(0.495)	2441	1.00000	0.44(M)
15 Iodomethane	142	2.573	2.573	(0.523)	2870	2.00000	5.53(M)
17 Methylene Chloride	84	2.896	2.896	(0.589)	3710	1.00000	(M)
18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	8067	1.00000	1.09(M)
19 Carbon Disulfide	76	2.637	2.637	(0.536)	13923	2.00000	1.90(M)
20 trans-1,2-Dichloroethene	96	3.169	3.169	(0.645)	2823	1.00000	1.27(M)
22 1,1-Dichloroethane	63	3.627	3.627	(0.738)	3616	1.00000	0.34(M)
24 2-Butanone	43	4.354	4.354	(0.886)	3534	2.00000	2.35(M)

27 cis-1,2-Dichloroethene	96	4.305	4.305 (0.876)	3139	1.00000	1.19
28 Chloroform	83	4.676	4.676 (0.951)	5560	1.00000	1.17

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D Page 2
Report Date: 17-Nov-2022 14:02

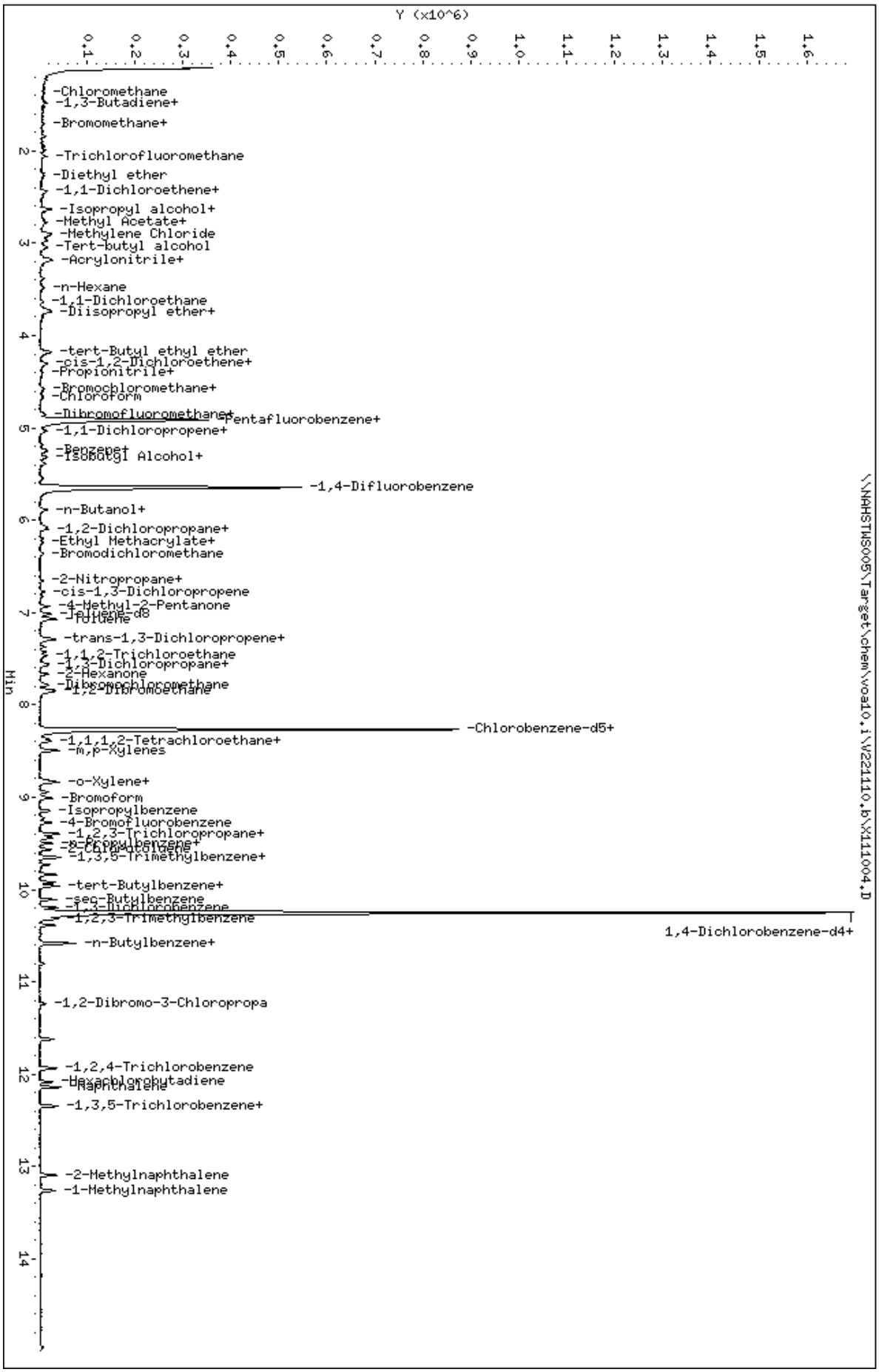
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.579	4.579	(0.931)	1376	1.00000	1.04(M)
$	30 Dibromofluoromethane	113	4.830	4.830	(0.982)	2689	1.00000	1.10(M)
	31 1,1,1-Trichloroethane	97	4.856	4.856	(0.988)	4411	1.00000	1.15(M)
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	3469	1.00000	1.00
	33 1,2-Dichloroethane	62	5.257	5.257	(0.932)	4355	1.00000	1.04(M)
	34 Carbon Tetrachloride	117	5.029	5.029	(0.891)	2841	1.00000	0.94(MH)
$	35 1,2-Dichloroethane-d4	65	5.182	5.182	(1.054)	3375	1.00000	1.08(TM)
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	448836	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	11582	1.00000	1.01
	38 Trichloroethene	130	5.887	5.887	(1.043)	3119	1.00000	1.06(M)
	39 Bromodichloromethane	83	6.356	6.356	(1.126)	3747	1.00000	1.05(M)
	42 1,2-Dichloropropane	63	6.093	6.093	(1.080)	3172	1.00000	0.99
	45 4-Methyl-2-Pentanone	43	6.933	6.933	(0.838)	9918	2.00000	5.41(M)
	46 cis-1,3-Dichloropropene	75	6.768	6.768	(1.199)	5008	1.00000	1.05
*	47 Chlorobenzene-d5	117	8.271	8.271	(1.000)	416318	50.0000	
$	48 Toluene-d8	98	7.012	7.012	(0.848)	10487	1.00000	1.27
	50 Toluene	91	7.072	7.072	(0.855)	11735	1.00000	0.95
	51 trans-1,3-Dichloropropene	75	7.274	7.274	(1.289)	4337	1.00000	1.03
	52 2-Hexanone	43	7.664	7.664	(0.927)	7919	2.00000	4.60(M)
	53 1,1,2-Trichloroethane	83	7.431	7.431	(0.898)	2594	1.00000	1.05(M)
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	5200	1.00000	1.03
	55 Dibromochloromethane	129	7.769	7.769	(0.939)	3447	1.00000	1.07
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	2117	1.00000	0.83(M)
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	2869	1.00000	0.95
	59 Chlorobenzene	112	8.290	8.290	(1.002)	9057	1.00000	1.08
	60 1,1,1,2-Tetrachloroethane	131	8.369	8.369	(1.012)	3409	1.00000	1.13
	61 Ethylbenzene	106	8.395	8.395	(1.015)	3976	1.00000	0.96
	62 m,p-Xylenes	106	8.496	8.496	(1.027)	10751	2.00000	2.12
	63 o-Xylene	106	8.826	8.826	(1.067)	4980	1.00000	0.98
	64 Styrene	104	8.848	8.848	(1.070)	9205	1.00000	1.00
	66 Bromoform	173	8.995	8.995	(1.087)	3052	1.00000	2.38(TM)
	67 Isopropylbenzene	105	9.148	9.148	(1.106)	12145	1.00000	0.97
	68 1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	8355	1.00000	1.13(M)
$	69 4-Bromofluorobenzene	95	9.268	9.268	(1.121)	5536	1.00000	2.25
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	389375	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	12465	1.00000	0.78
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	12151	1.00000	0.88
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	17742	1.00000	1.02
	81 sec-Butylbenzene	105	10.112	10.112	(0.986)	19033	1.00000	0.98
	87 n-Butylbenzene	91	10.573	10.573	(1.031)	16578	1.00000	0.98
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	16600	1.00000	0.78
	71 1,2,3-Trichloropropane	75	9.429	9.429	(0.920)	8915	1.00000	1.07
	83 1,3-Dichlorobenzene	146	10.194	10.194	(0.995)	13789	1.00000	1.15
	84 1,4-Dichlorobenzene	146	10.269	10.269	(1.002)	15449	1.00000	1.93
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	15233	1.00000	1.39
	89 1,2-Dibromo-3-Chloropropane	155	11.233	11.233	(1.096)	1276	1.00000	1.06(M)
	90 1,2,4-Trichlorobenzene	180	11.934	11.934	(1.164)	10119	1.00000	1.27(M)
	92 Naphthalene	128	12.143	12.143	(1.185)	27530	1.00000	1.25
	136 n-Hexane	57	3.484	3.484	(0.709)	4978	1.00000	1.64
	147 Methylcyclohexane	55	6.071	6.071	(1.076)	3862	1.00000	0.93
	141 Cyclohexane	56	4.905	4.905	(0.998)	3454	1.00000	0.56(M)
	138 Freon TF	101	2.434	2.434	(0.495)	1766	1.00000	0.14(M)

146	Methyl Acetate	43	2.813	2.813 (0.572)	2351	1.00000	0.99(M)
21	Vinyl Acetate	43	3.713	3.713 (0.755)	11860	2.00000	2.02(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
26	2,2-Dichloropropane	77	4.298	4.298	(0.874)	3565	1.00000	1.01(M)
44	Dibromomethane	93	6.209	6.209	(1.100)	2063	1.00000	1.12(M)
91	Hexachlorobutadiene	225	12.083	12.083	(1.179)	4764	1.00000	0.22(M)
74	Bromobenzene	156	9.403	9.403	(0.917)	5002	1.00000	0.84
76	2-Chlorotoluene	91	9.564	9.564	(0.933)	10447	1.00000	2.14
77	4-Chlorotoluene	91	9.654	9.654	(0.942)	13492	1.00000	0.81
82	p-Isopropyltoluene	119	10.228	10.228	(0.998)	16590	1.00000	0.94
93	1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	10414	1.00000	1.11(M)
148	tert-Butyl Alcohol	59	3.042	3.042	(0.619)	16498	20.0000	45.56
M 94	1,2-Dichloroethylene (total)	96				5962	2.00000	
M 95	Xylenes (total)	106				15731	3.00000	

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Sample Info: VSTD001;VSTD001;1;3;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: FT
Column diameter: 0.18

\\NAHSTMS005\Target\chem\voa10.i\V221110.b\X111004.D

Page 1

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Dichlorodifluoromethane (75-71-8)

Reason Code:

BEFORE

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HEIGHT
3753
17-Nov-2022
13:58
linh
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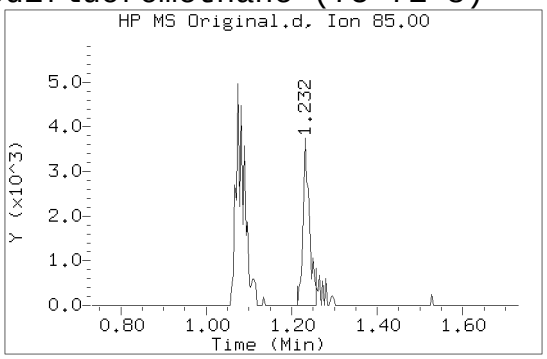

AFTER

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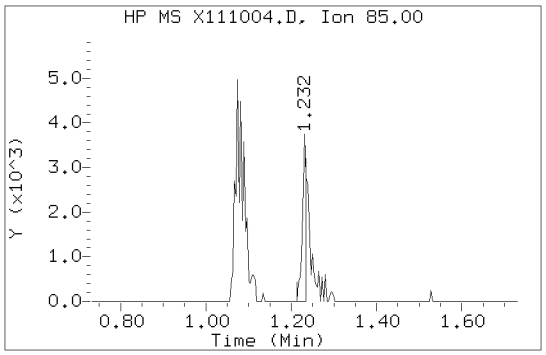
linh
pham



BEFORE

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1383
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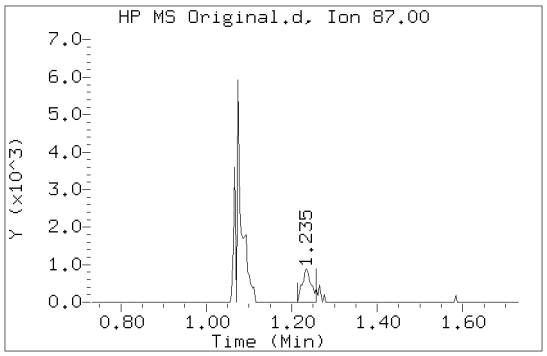
895
17-Nov-2022
13:58
linh
pham



AFTER

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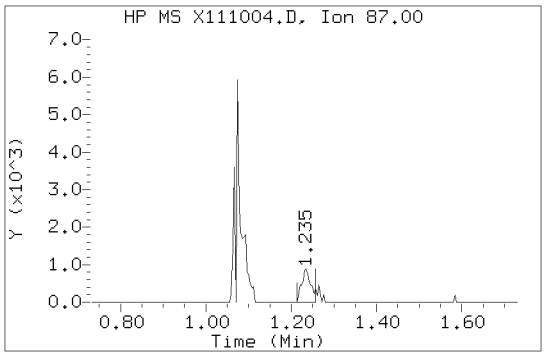

Chloromethane (74-87-3)

Reason Code:

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17-Nov-2022
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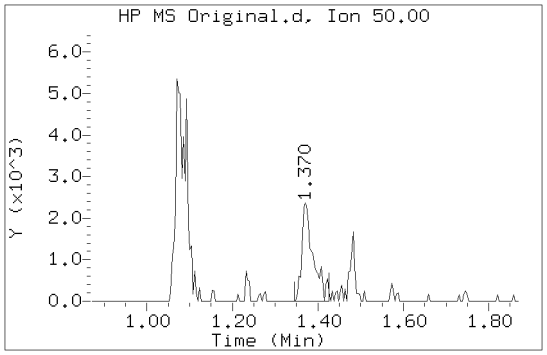

AFTER

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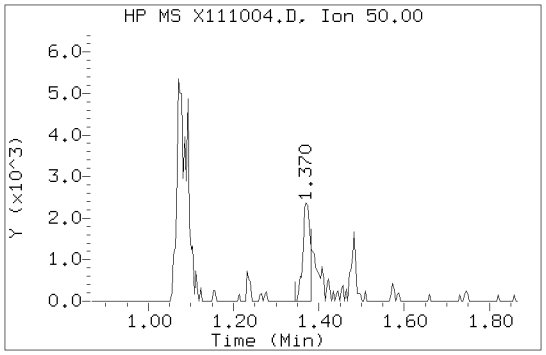

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AREA
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1225
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13:58
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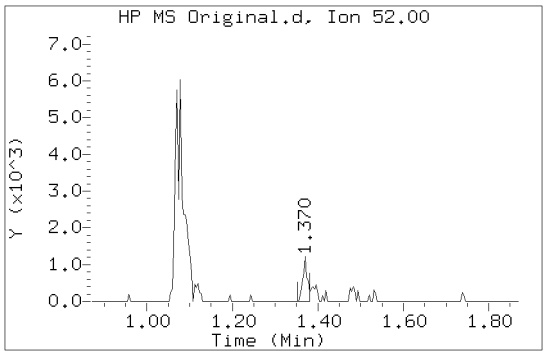

AFTER

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1225
17-Nov-2022
14:02
linh
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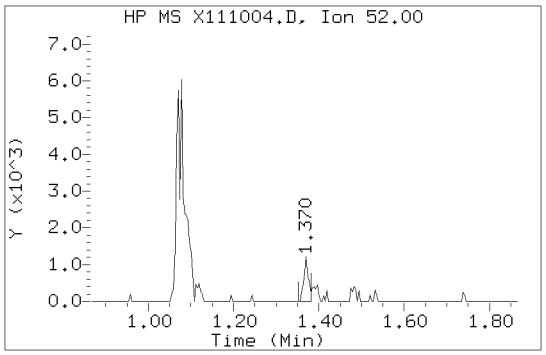

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Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Vinyl Chloride (75-01-4)

Reason Code:

BEFORE

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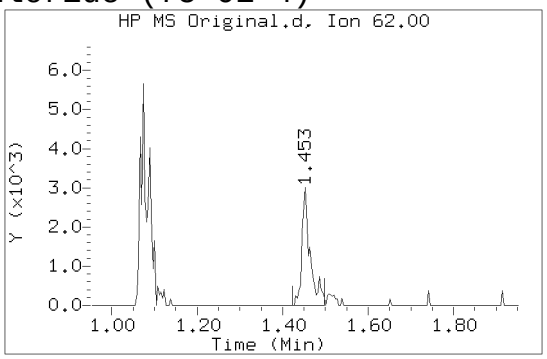
17-Nov-2022
13:58
linh
pham



AFTER

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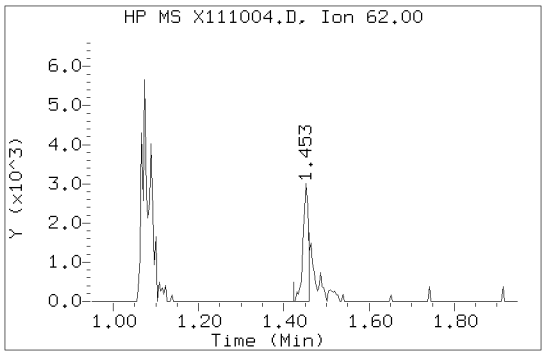

BEFORE

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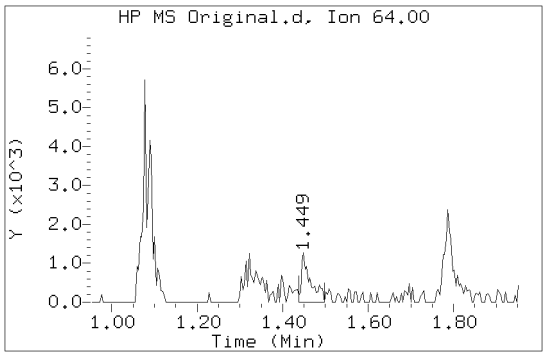

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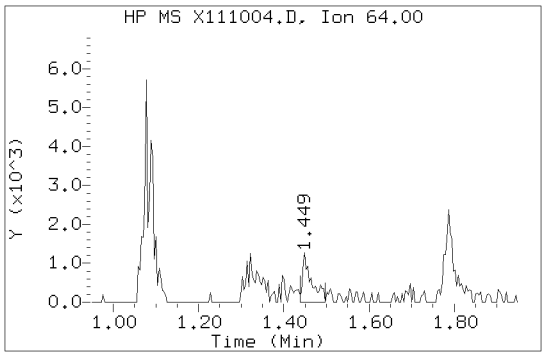

Bromomethane (74-83-9)

Reason Code:

BEFORE

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AREA
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HEIGHT
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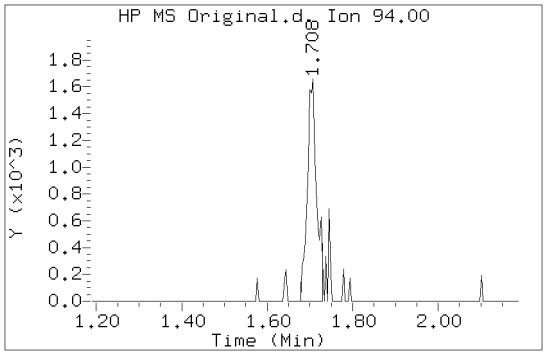
17-Nov-2022
13:58
linh
pham



AFTER

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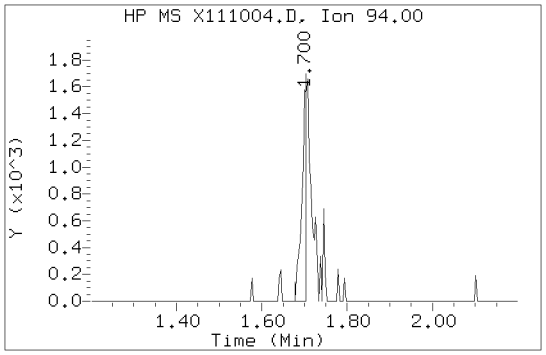

BEFORE

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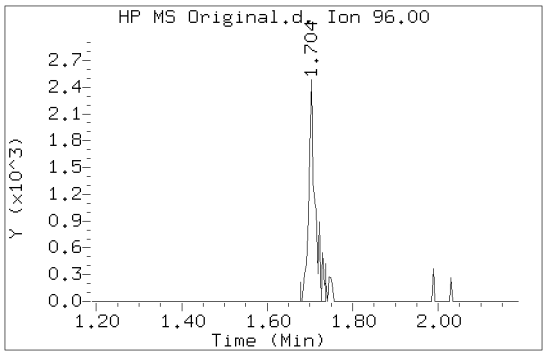

AFTER

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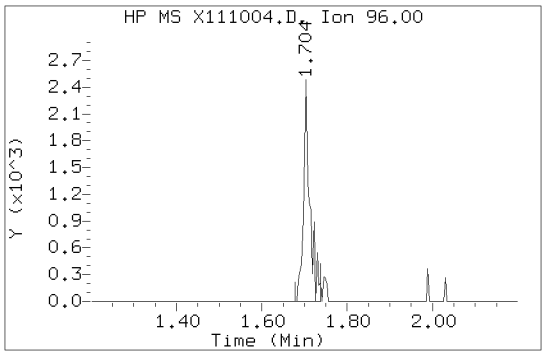
14:02
linh
pham



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Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Chloroethane (75-00-3)

Reason Code:

BEFORE

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17-Nov-2022
13:58
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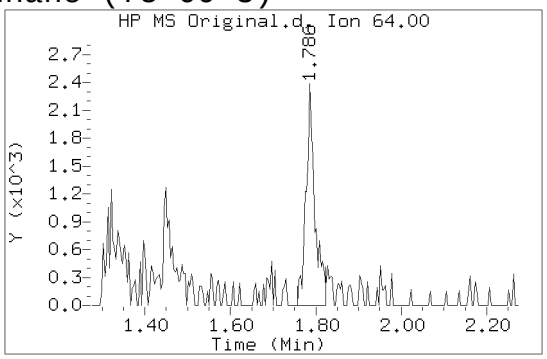

AFTER

MASS
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AREA
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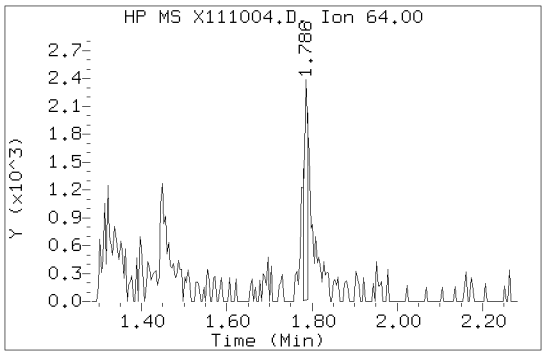
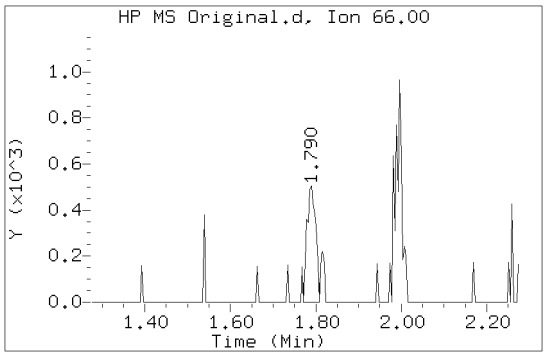
2370
17-Nov-2022
14:02
linh
pham



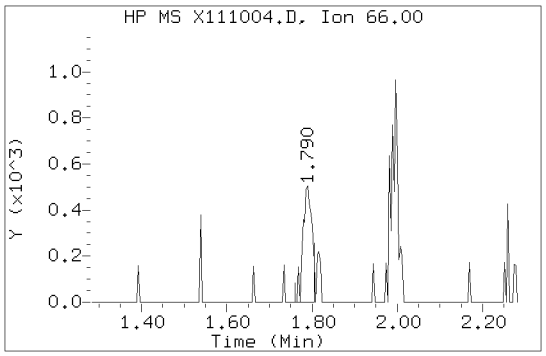
BEFORE

MASS
66
AREA
718
HEIGHT
506
17-Nov-2022
13:58
linh
pham



AFTER

MASS
66
AREA
752
HEIGHT
506
17-Nov-2022
14:02
linh
pham

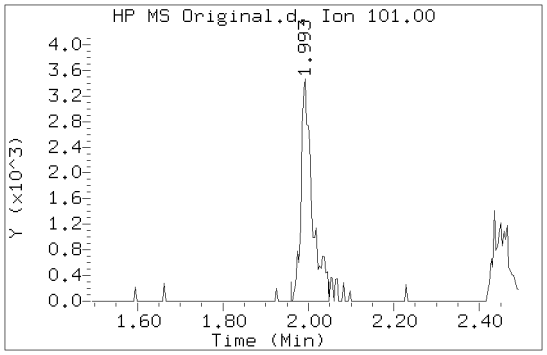


Trichlorofluoromethane (75-69-4)

Reason Code:

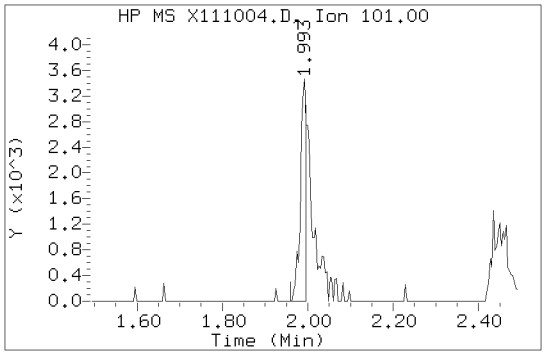
BEFORE

MASS
101
AREA
6474
HEIGHT
3467
17-Nov-2022
13:58
linh
pham



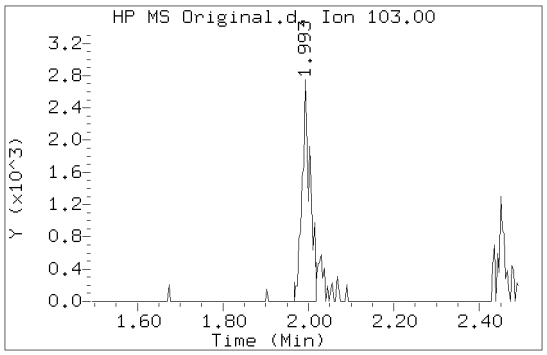
AFTER

MASS
101
AREA
3422
HEIGHT
3467
17-Nov-2022
14:02
linh
pham



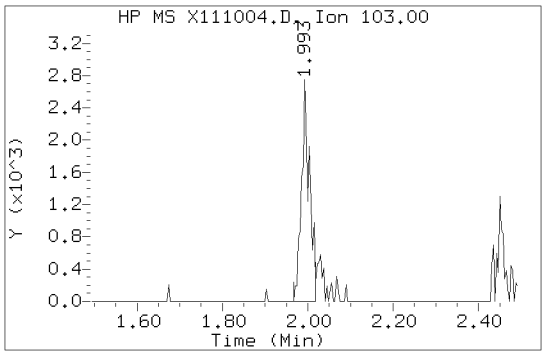
BEFORE

MASS
103
AREA
3698
HEIGHT
2750
17-Nov-2022
13:58
linh
pham



AFTER

MASS
103
AREA
3698
HEIGHT
2750
17-Nov-2022
14:02
linh
pham



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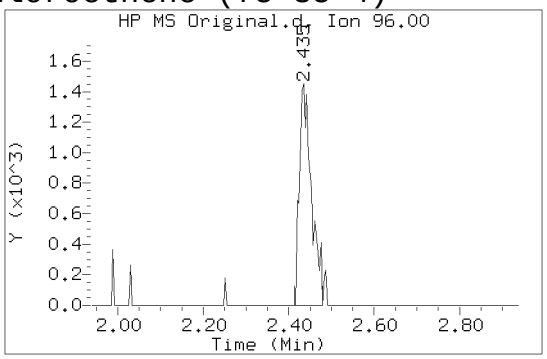
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

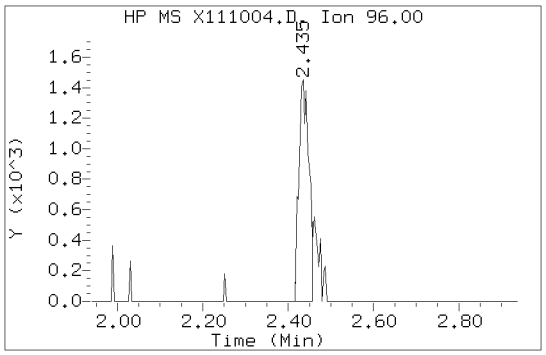
1,1-Dichloroethene (75-35-4)

Reason Code:

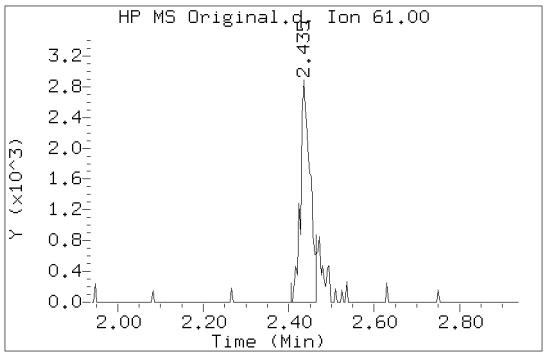
BEFORE
MASS
96
AREA
2891
HEIGHT
1452
17-Nov-2022
13:58
linh
pham



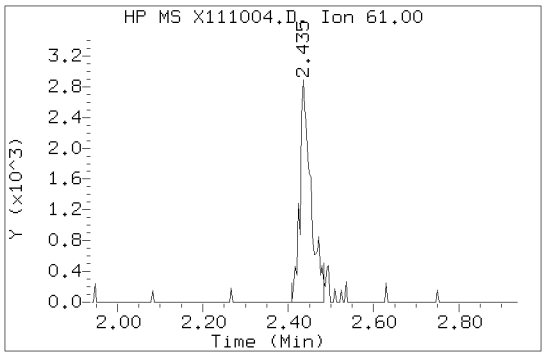
AFTER
MASS
96
AREA
2441
HEIGHT
1452
17-Nov-2022
14:02
linh
pham



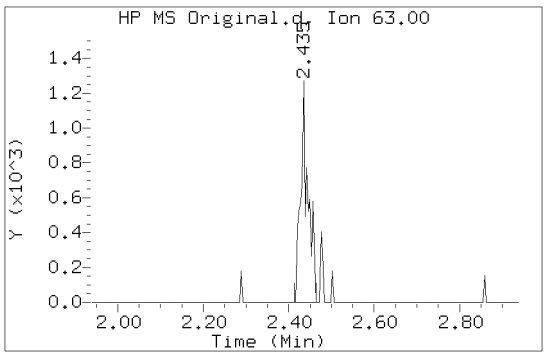
BEFORE
MASS
61
AREA
4654
HEIGHT
2889
17-Nov-2022
13:58
linh
pham



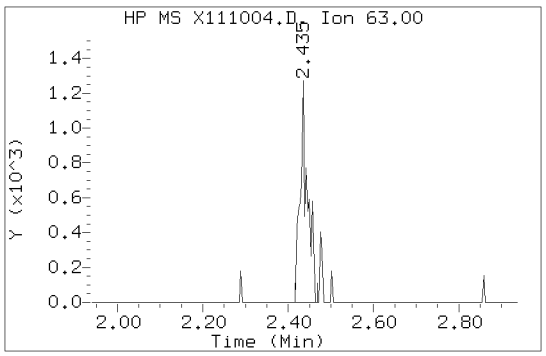
AFTER
MASS
61
AREA
5238
HEIGHT
2889
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
63
AREA
1556
HEIGHT
1272
17-Nov-2022
13:58
linh
pham



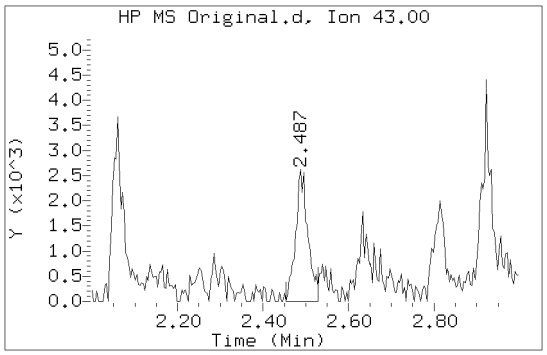
AFTER
MASS
63
AREA
1557
HEIGHT
1272
17-Nov-2022
14:02
linh
pham



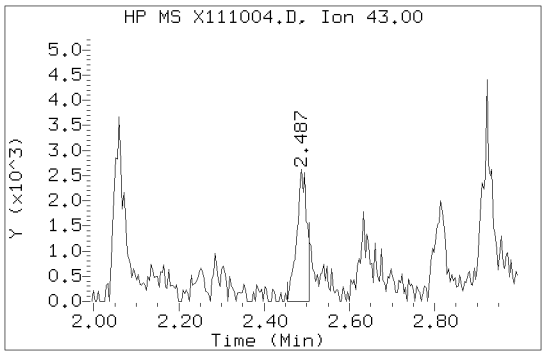
Acetone (67-64-1)

Reason Code:

BEFORE
MASS
43
AREA
5245
HEIGHT
2620
17-Nov-2022
13:58
linh
pham



AFTER
MASS
43
AREA
4443
HEIGHT
2620
17-Nov-2022
14:02
linh
pham



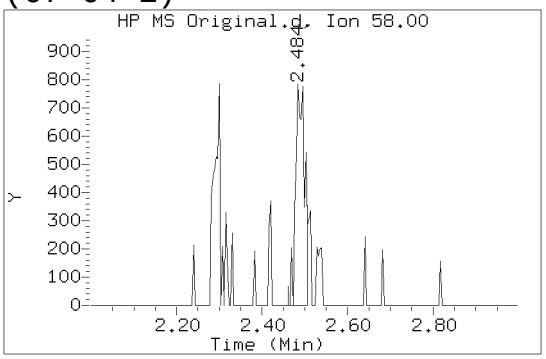
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Acetone (67-64-1)

Reason Code:

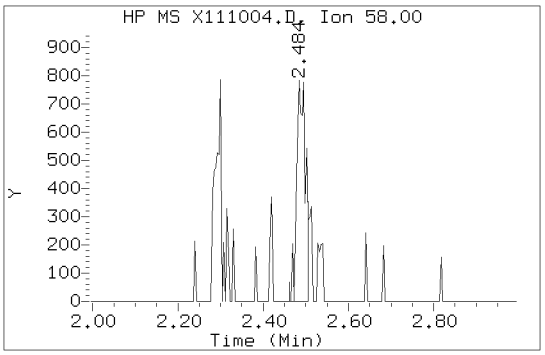
BEFORE

MASS
58
AREA
1158
HEIGHT
784
17-Nov-2022
13:58
linh
pham



AFTER

MASS
58
AREA
1158
HEIGHT
784
17-Nov-2022
14:02
linh
pham

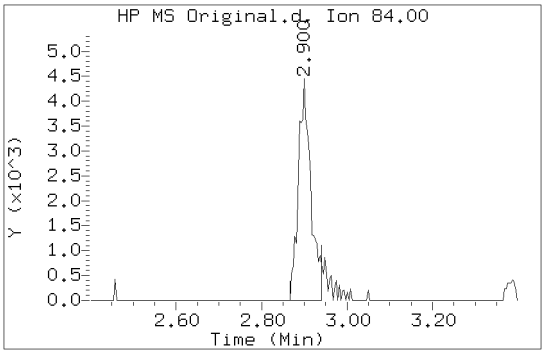


Methylene Chloride (75-09-2)

Reason Code:

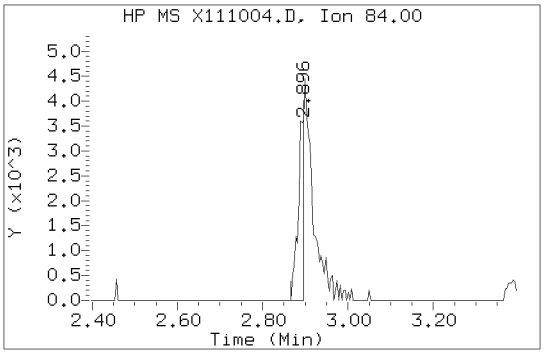
BEFORE

MASS
84
AREA
9219
HEIGHT
4451
17-Nov-2022
13:58
linh
pham



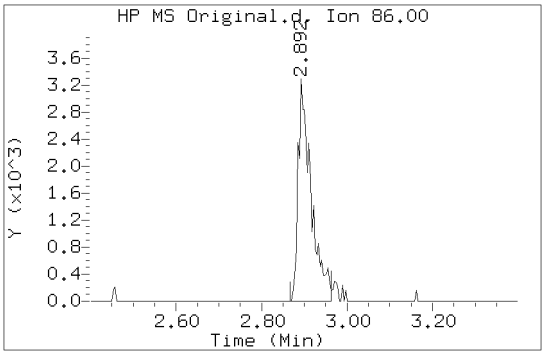
AFTER

MASS
84
AREA
3710
HEIGHT
3625
17-Nov-2022
14:02
linh
pham



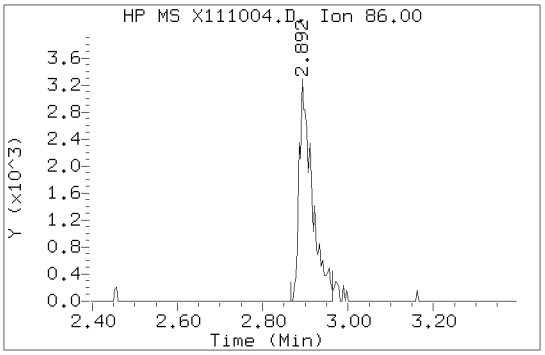
BEFORE

MASS
86
AREA
7044
HEIGHT
3292
17-Nov-2022
13:58
linh
pham



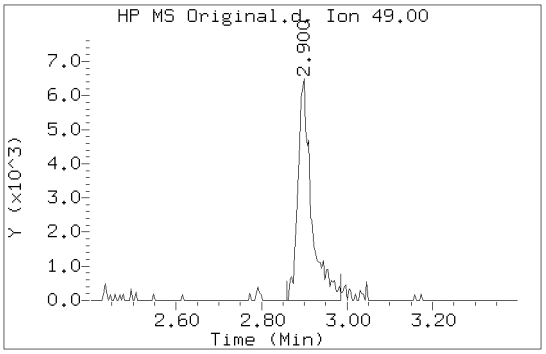
AFTER

MASS
86
AREA
7044
HEIGHT
3292
17-Nov-2022
14:02
linh
pham



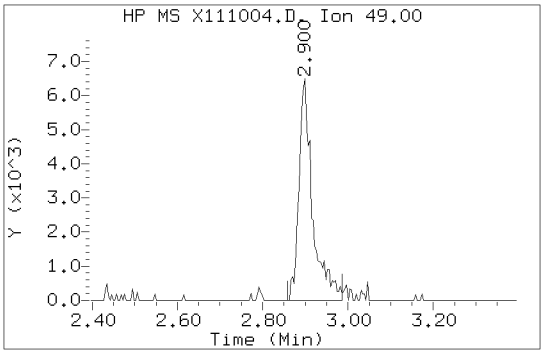
BEFORE

MASS
49
AREA
14696
HEIGHT
6492
17-Nov-2022
13:58
linh
pham



AFTER

MASS
49
AREA
14696
HEIGHT
6492
17-Nov-2022
14:02
linh
pham



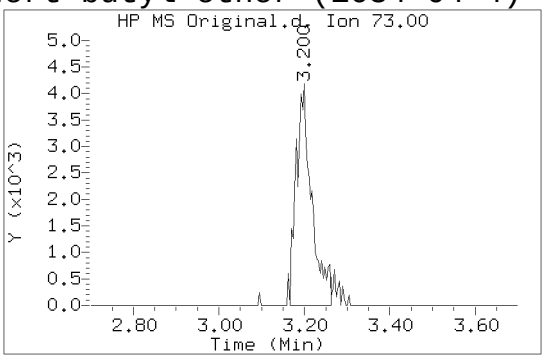
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Methyl tert-butyl ether (1634-04-4)

Reason Code:

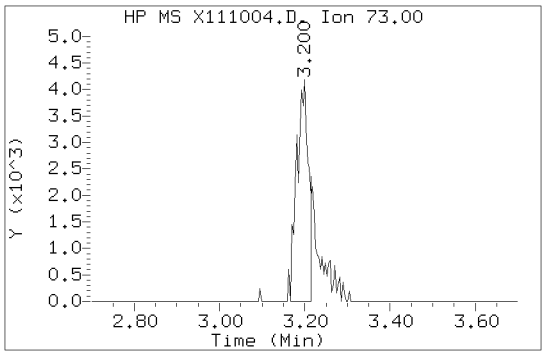
BEFORE

MASS
73
AREA
10616
HEIGHT
4185
17-Nov-2022
13:58
linh
pham



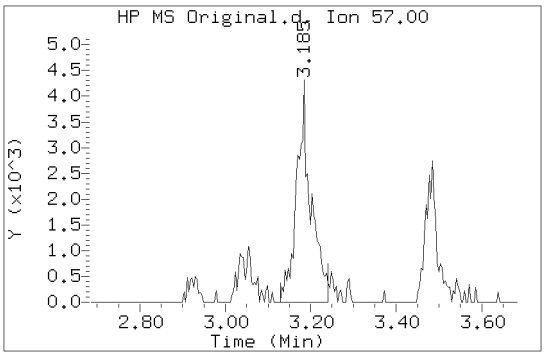
AFTER

MASS
73
AREA
8067
HEIGHT
4185
17-Nov-2022
14:02
linh
pham



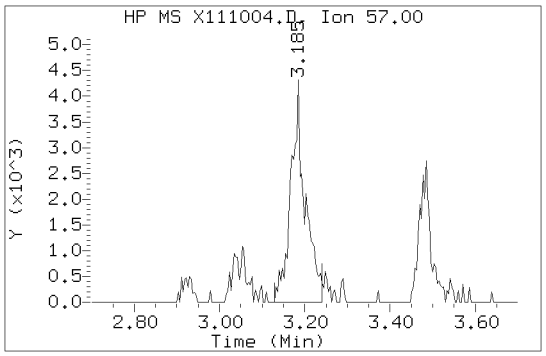
BEFORE

MASS
57
AREA
10047
HEIGHT
4316
17-Nov-2022
13:58
linh
pham



AFTER

MASS
57
AREA
10047
HEIGHT
4316
17-Nov-2022
14:02
linh
pham

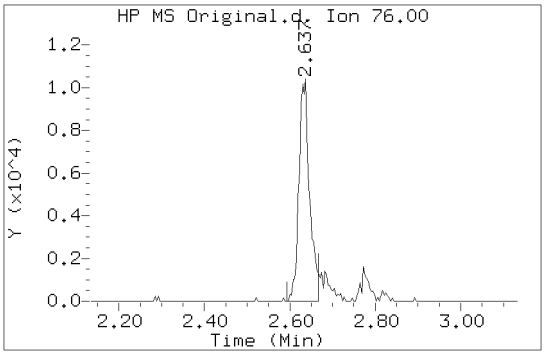


Carbon Disulfide (75-15-0)

Reason Code:

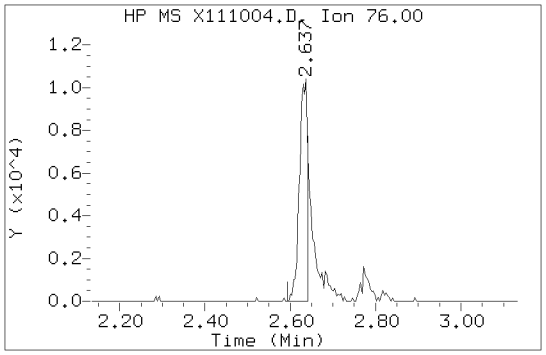
BEFORE

MASS
76
AREA
18464
HEIGHT
10410
17-Nov-2022
13:58
linh
pham



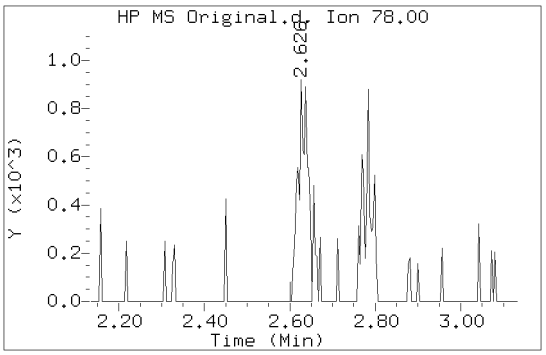
AFTER

MASS
76
AREA
13923
HEIGHT
10410
17-Nov-2022
14:02
linh
pham



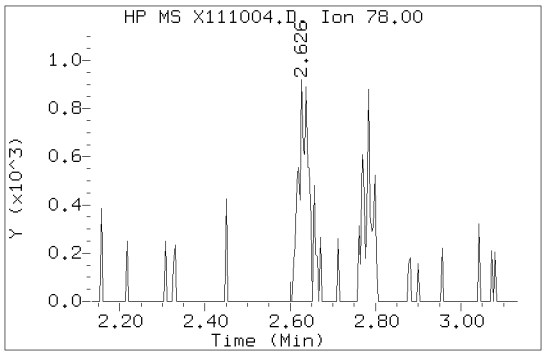
BEFORE

MASS
78
AREA
1433
HEIGHT
920
17-Nov-2022
13:58
linh
pham



AFTER

MASS
78
AREA
1433
HEIGHT
920
17-Nov-2022
14:02
linh
pham



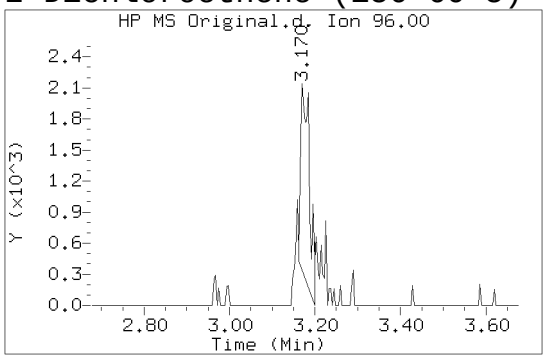
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

trans-1,2-Dichloroethene (156-60-5)

Reason Code:

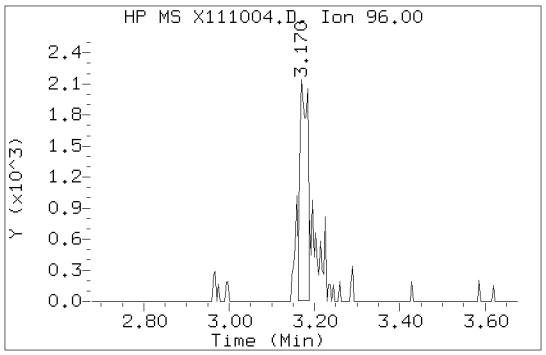
BEFORE

MASS
96
AREA
2721
HEIGHT
1799
17-Nov-2022
13:58
linh
pham



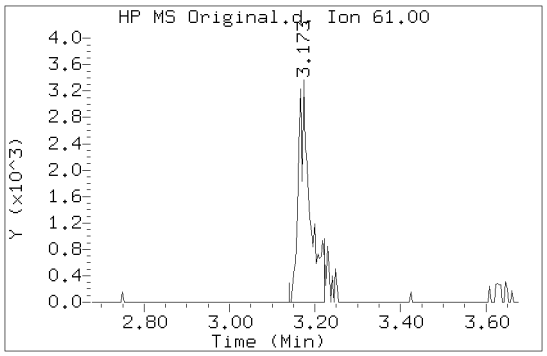
AFTER

MASS
96
AREA
2823
HEIGHT
2135
17-Nov-2022
14:02
linh
pham



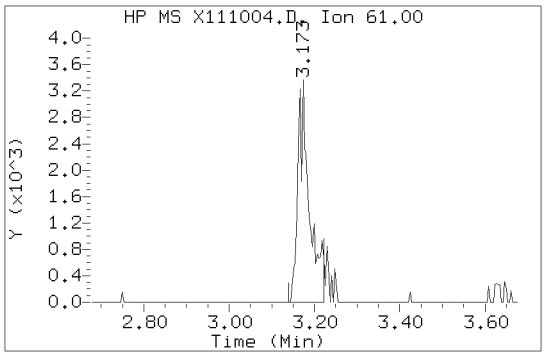
BEFORE

MASS
61
AREA
6372
HEIGHT
3368
17-Nov-2022
13:58
linh
pham



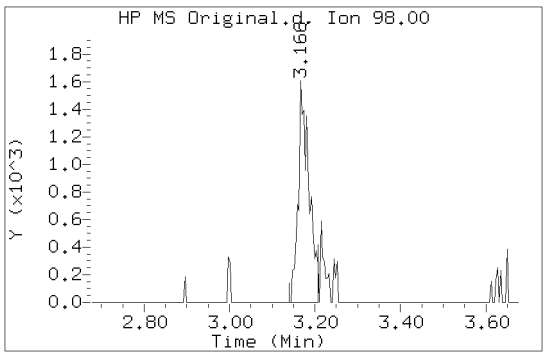
AFTER

MASS
61
AREA
6372
HEIGHT
3368
17-Nov-2022
14:02
linh
pham



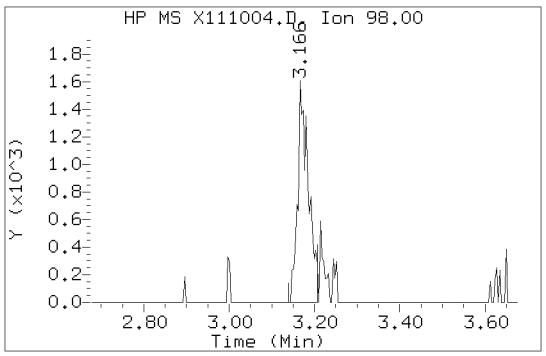
BEFORE

MASS
98
AREA
2851
HEIGHT
1607
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
2851
HEIGHT
1607
17-Nov-2022
14:02
linh
pham

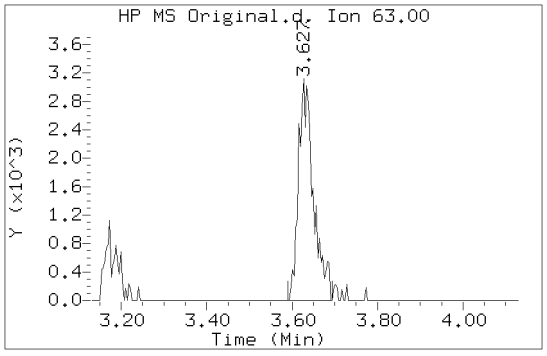


1,1-Dichloroethane (75-34-3)

Reason Code:

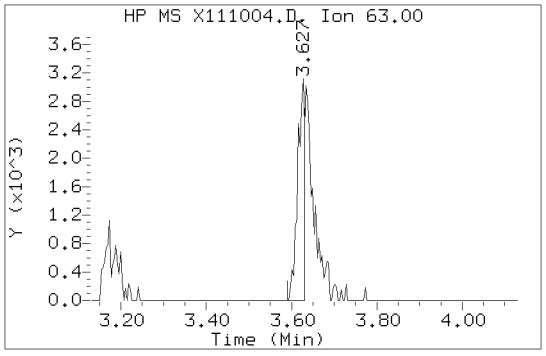
BEFORE

MASS
63
AREA
7642
HEIGHT
3121
17-Nov-2022
13:58
linh
pham



AFTER

MASS
63
AREA
3616
HEIGHT
3121
17-Nov-2022
14:02
linh
pham



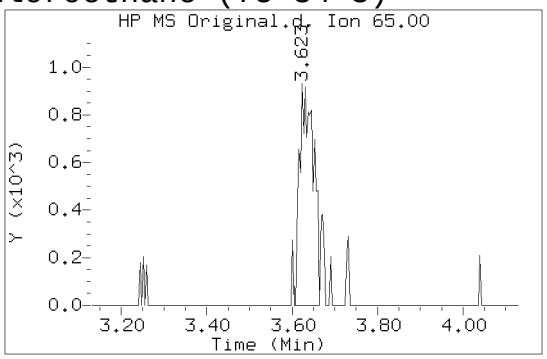
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

1,1-Dichloroethane (75-34-3)

Reason Code:

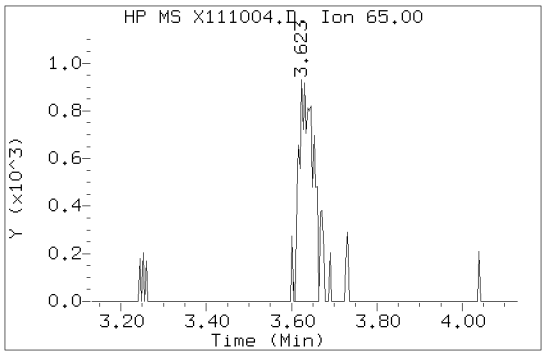
BEFORE

MASS
65
AREA
2135
HEIGHT
931
17-Nov-2022
13:58
linh
pham



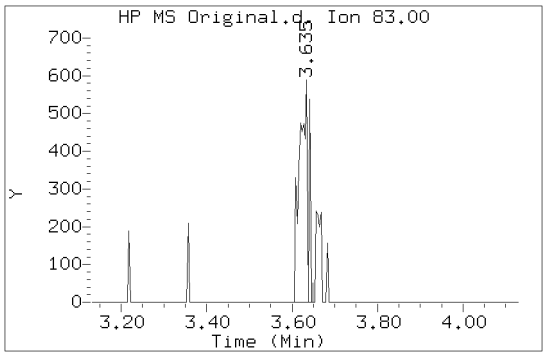
AFTER

MASS
65
AREA
2135
HEIGHT
931
17-Nov-2022
14:02
linh
pham



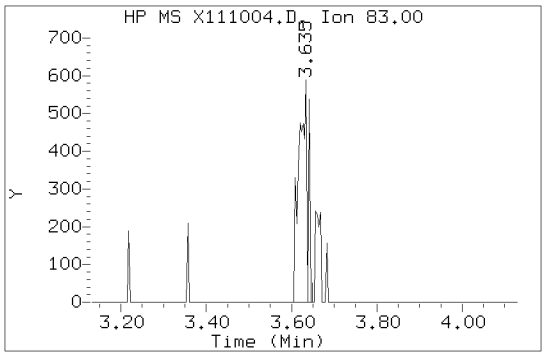
BEFORE

MASS
83
AREA
867
HEIGHT
589
17-Nov-2022
13:58
linh
pham



AFTER

MASS
83
AREA
867
HEIGHT
589
17-Nov-2022
14:02
linh
pham

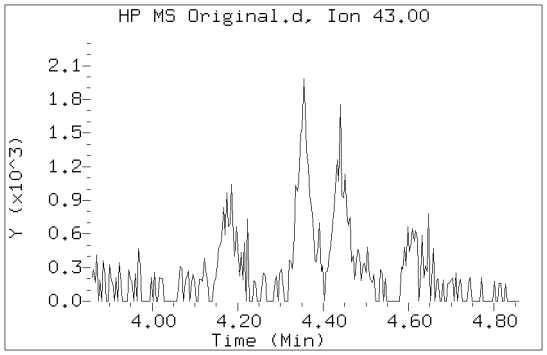


2-Butanone (78-93-3)

Reason Code:

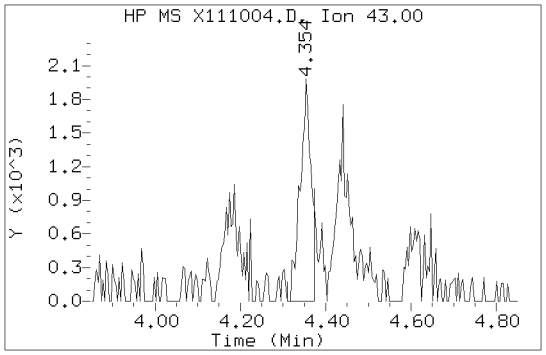
BEFORE

MASS
43
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



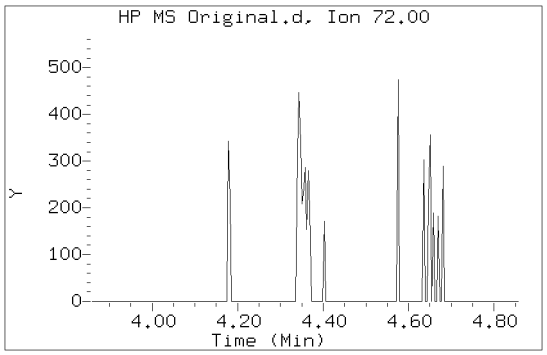
AFTER

MASS
43
AREA
3534
HEIGHT
1982
17-Nov-2022
14:02
linh
pham



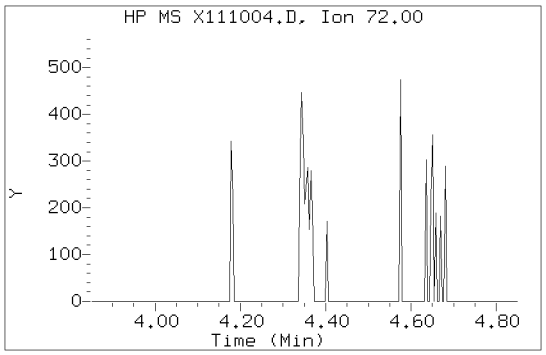
BEFORE

MASS
72
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
72
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



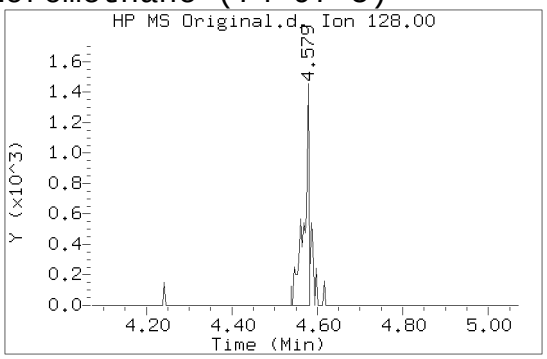
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Bromochloromethane (74-97-5)

Reason Code:

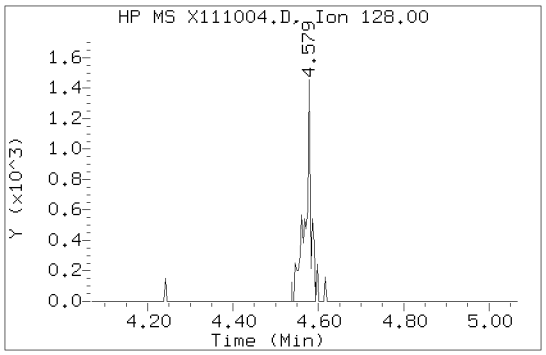
BEFORE

MASS
128
AREA
1168
HEIGHT
1456
17-Nov-2022
13:58
linh
pham



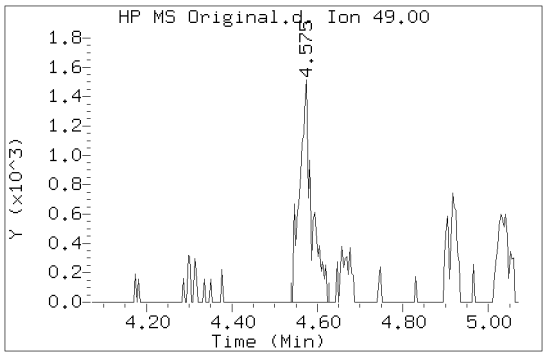
AFTER

MASS
128
AREA
1376
HEIGHT
1456
17-Nov-2022
14:02
linh
pham



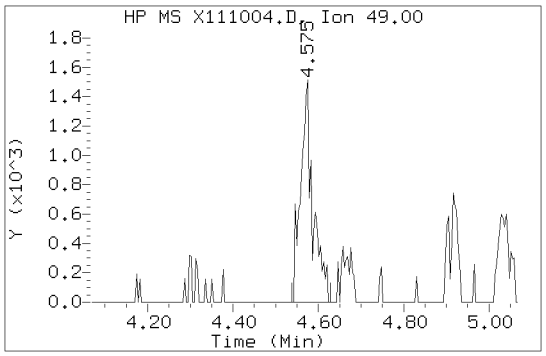
BEFORE

MASS
49
AREA
3049
HEIGHT
1514
17-Nov-2022
13:58
linh
pham



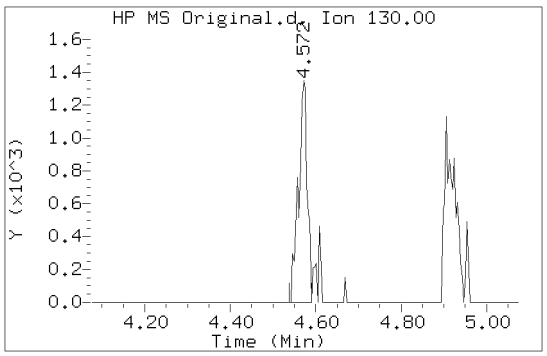
AFTER

MASS
49
AREA
3049
HEIGHT
1514
17-Nov-2022
14:02
linh
pham



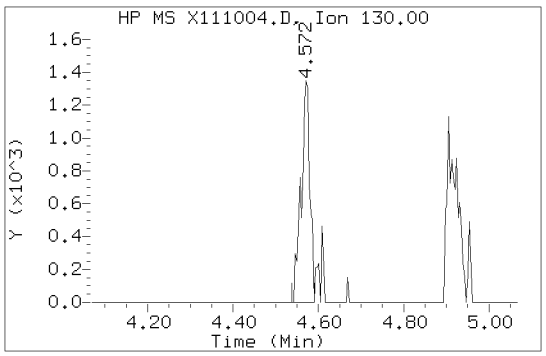
BEFORE

MASS
130
AREA
1965
HEIGHT
1349
17-Nov-2022
13:58
linh
pham



AFTER

MASS
130
AREA
1965
HEIGHT
1349
17-Nov-2022
14:02
linh
pham

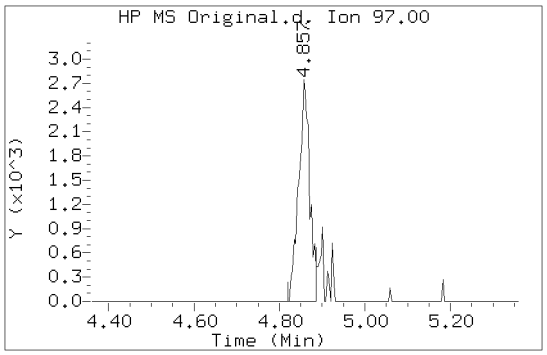


1,1,1-Trichloroethane (71-55-6)

Reason Code:

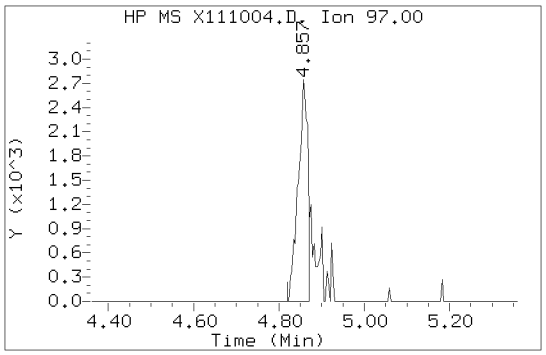
BEFORE

MASS
97
AREA
5061
HEIGHT
2744
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
4411
HEIGHT
2744
17-Nov-2022
14:02
linh
pham



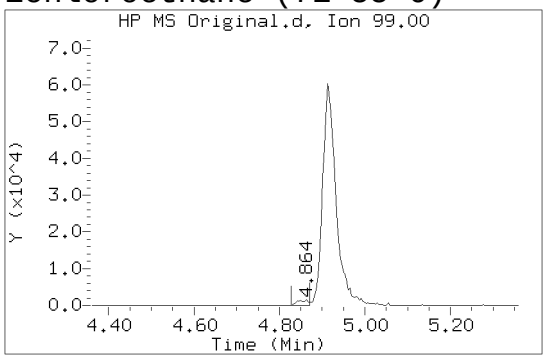
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

1,1,1-Trichloroethane (71-55-6)

Reason Code:

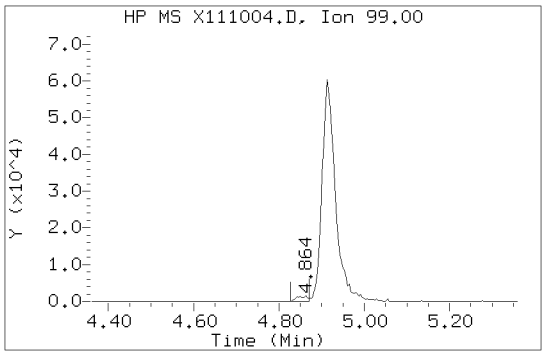
BEFORE

MASS
99
AREA
2638
HEIGHT
1496
17-Nov-2022
13:58
linh
pham



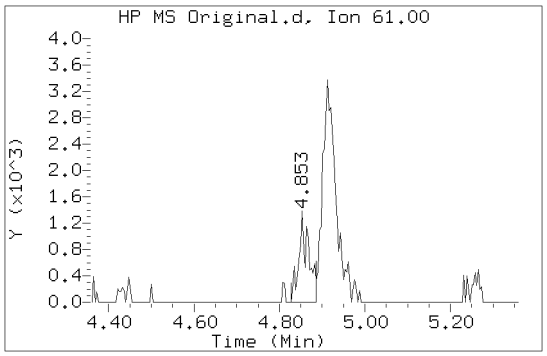
AFTER

MASS
99
AREA
2638
HEIGHT
1496
17-Nov-2022
14:02
linh
pham



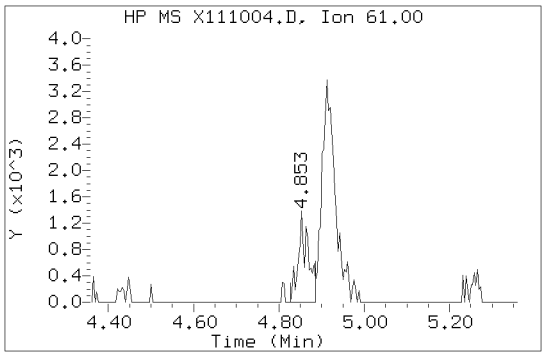
BEFORE

MASS
61
AREA
2254
HEIGHT
1389
17-Nov-2022
13:58
linh
pham



AFTER

MASS
61
AREA
2254
HEIGHT
1389
17-Nov-2022
14:02
linh
pham

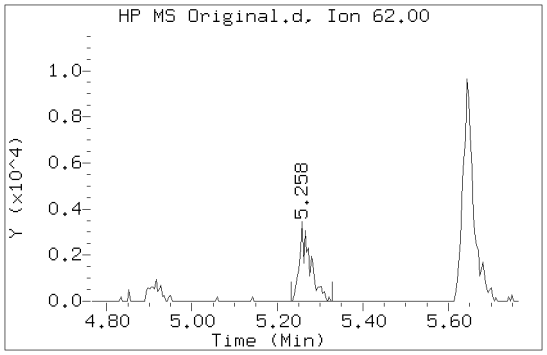


1,2-Dichloroethane (107-06-2)

Reason Code:

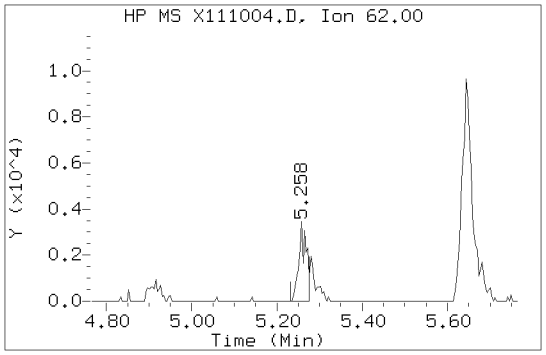
BEFORE

MASS
62
AREA
6094
HEIGHT
3454
17-Nov-2022
13:58
linh
pham



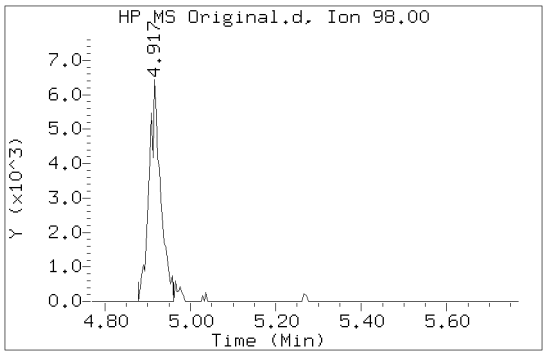
AFTER

MASS
62
AREA
4355
HEIGHT
3454
17-Nov-2022
14:02
linh
pham



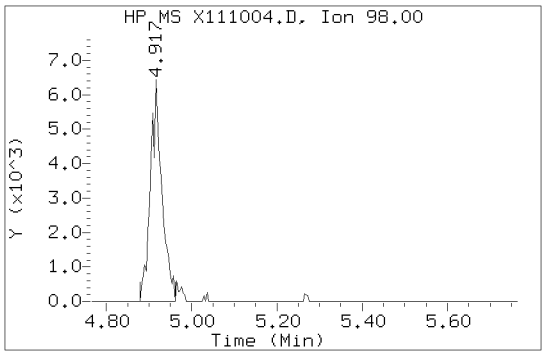
BEFORE

MASS
98
AREA
12001
HEIGHT
6435
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
12001
HEIGHT
6435
17-Nov-2022
14:02
linh
pham



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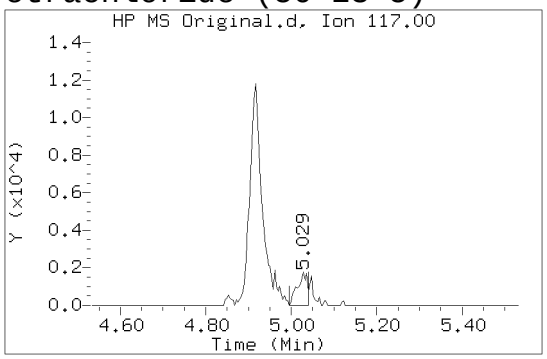
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

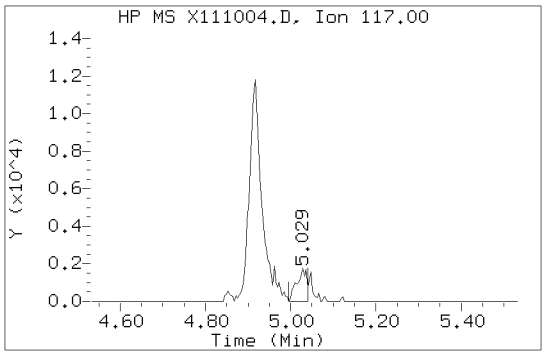
Carbon Tetrachloride (56-23-5)

Reason Code:

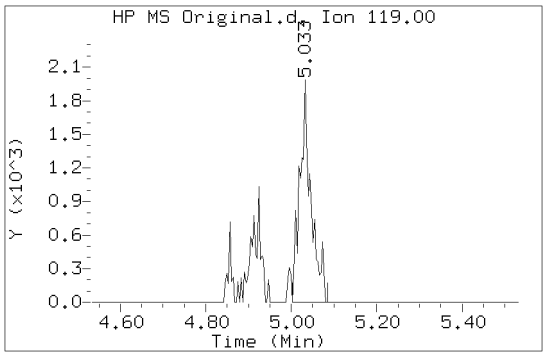
BEFORE
MASS
117
AREA
2841
HEIGHT
1768
17-Nov-2022
13:58
linh
pham



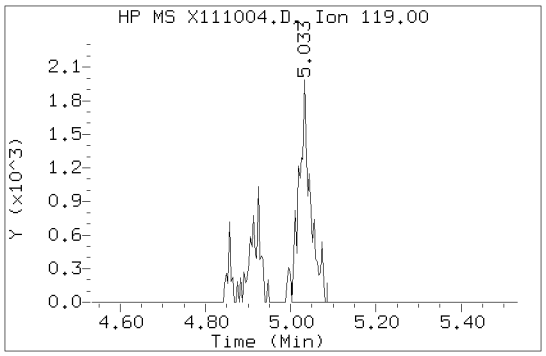
AFTER
MASS
117
AREA
2841
HEIGHT
1768
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
119
AREA
3635
HEIGHT
1986
17-Nov-2022
13:58
linh
pham



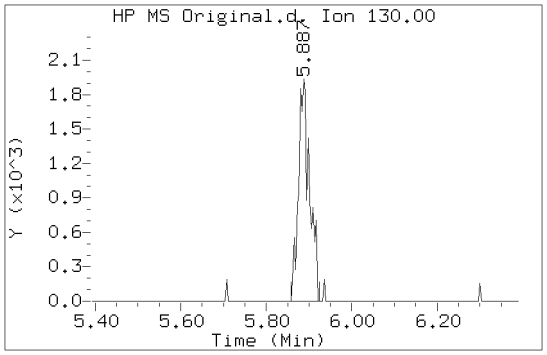
AFTER
MASS
119
AREA
3635
HEIGHT
1986
17-Nov-2022
14:02
linh
pham



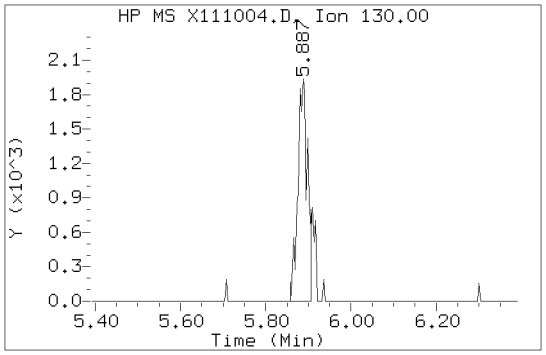
Trichloroethene (79-01-6)

Reason Code:

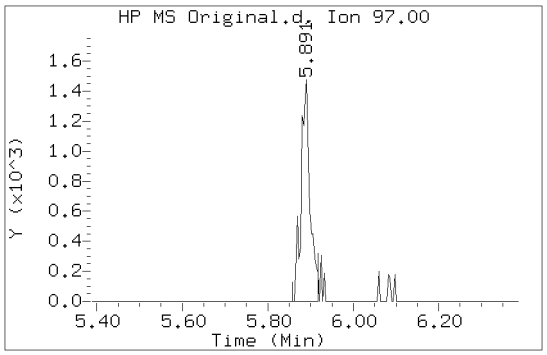
BEFORE
MASS
130
AREA
3578
HEIGHT
1937
17-Nov-2022
13:58
linh
pham



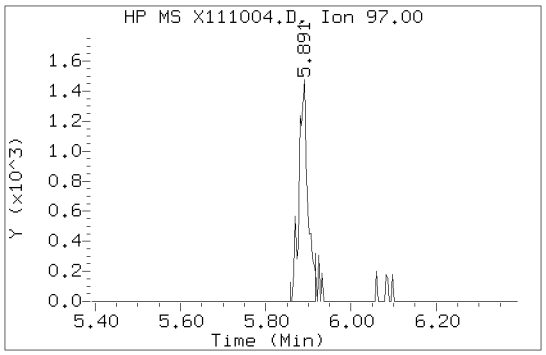
AFTER
MASS
130
AREA
3119
HEIGHT
1937
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
97
AREA
2206
HEIGHT
1476
17-Nov-2022
13:58
linh
pham



AFTER
MASS
97
AREA
2206
HEIGHT
1476
17-Nov-2022
14:02
linh
pham



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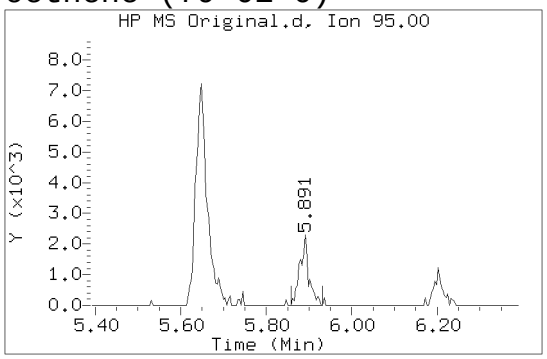
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Trichloroethene (79-01-6)

Reason Code:

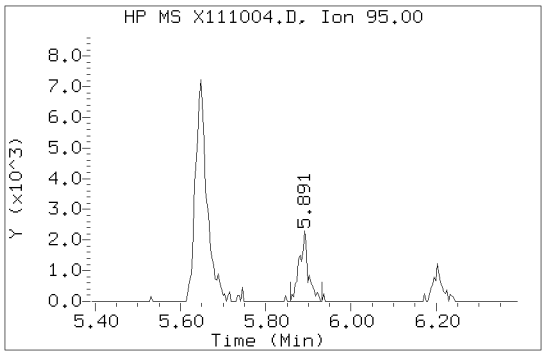
BEFORE

MASS
95
AREA
3416
HEIGHT
2297
17-Nov-2022
13:58
linh
pham



AFTER

MASS
95
AREA
3416
HEIGHT
2297
17-Nov-2022
14:02
linh
pham

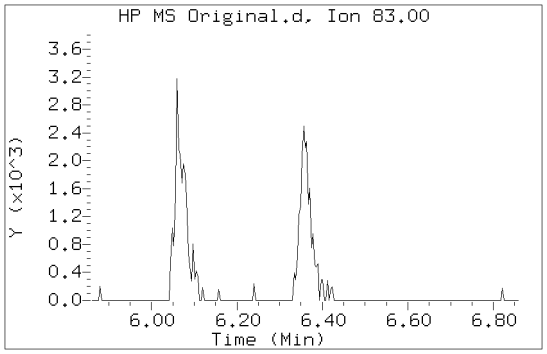


Bromodichloromethane (75-27-4)

Reason Code:

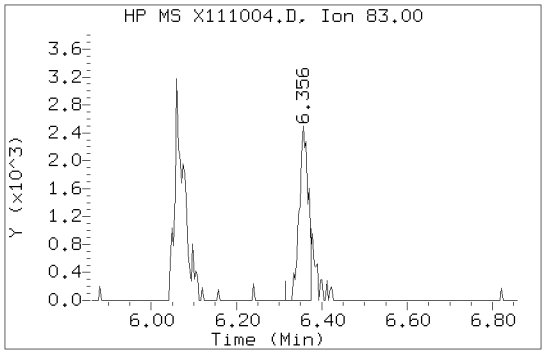
BEFORE

MASS
83
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



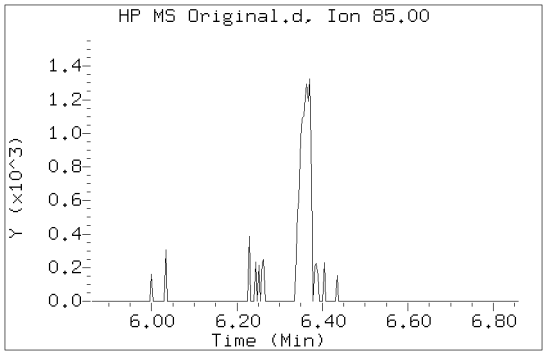
AFTER

MASS
83
AREA
3747
HEIGHT
2498
17-Nov-2022
14:02
linh
pham



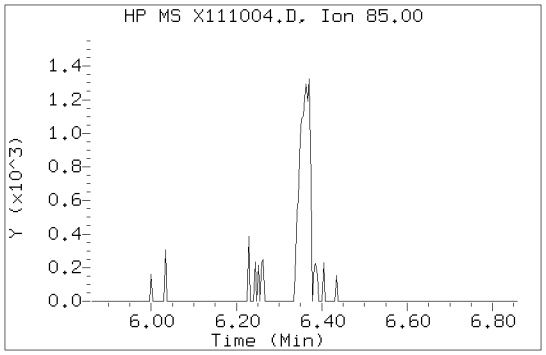
BEFORE

MASS
85
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



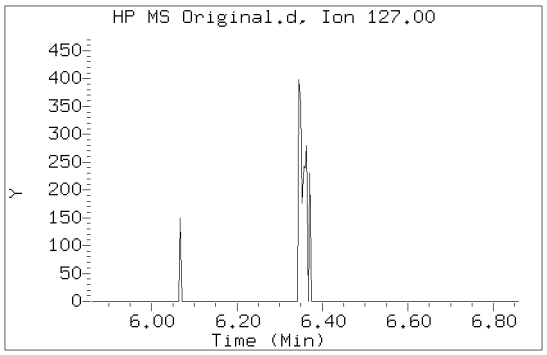
AFTER

MASS
85
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



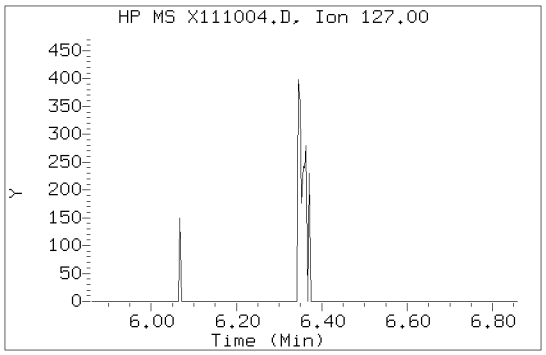
BEFORE

MASS
127
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
127
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



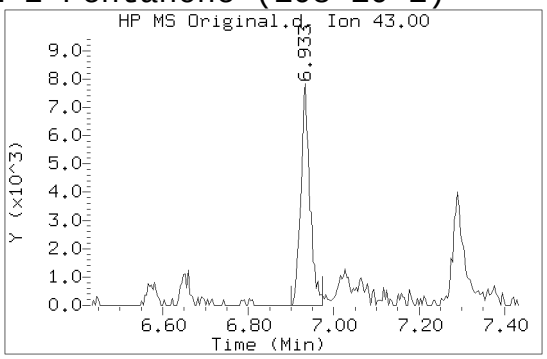
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

4-Methyl-2-Pentanone (108-10-1)

Reason Code:

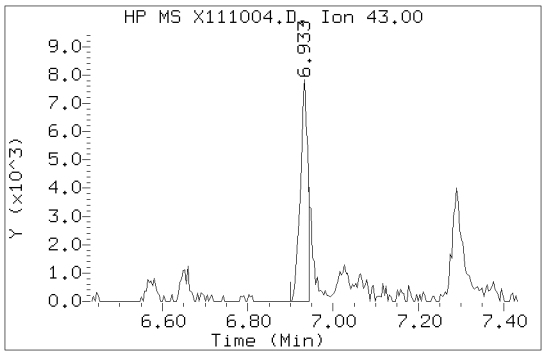
BEFORE

MASS
43
AREA
11889
HEIGHT
7832
17-Nov-2022
13:58
linh
pham



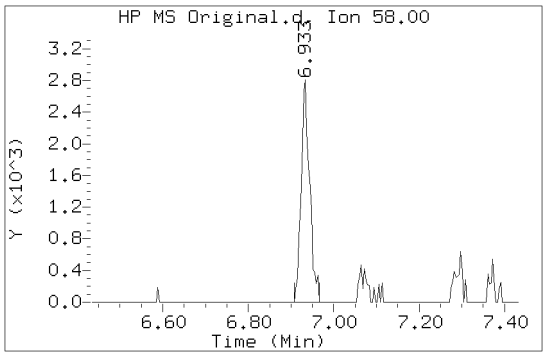
AFTER

MASS
43
AREA
9918
HEIGHT
7832
17-Nov-2022
14:02
linh
pham



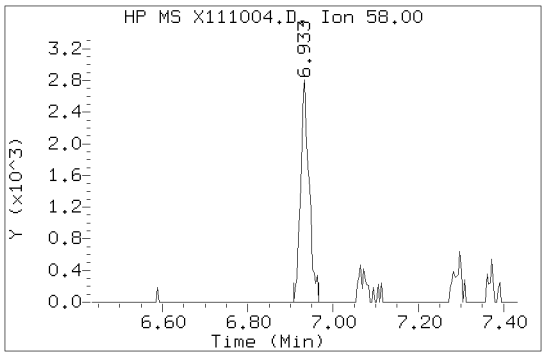
BEFORE

MASS
58
AREA
3985
HEIGHT
2807
17-Nov-2022
13:58
linh
pham



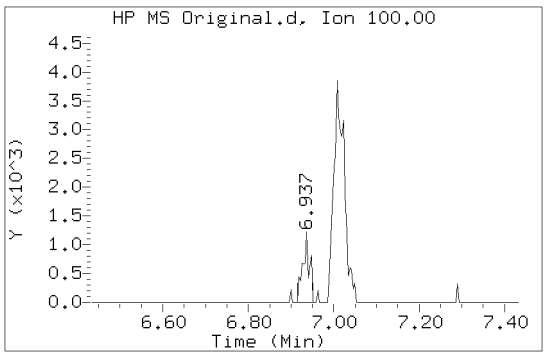
AFTER

MASS
58
AREA
3985
HEIGHT
2807
17-Nov-2022
14:02
linh
pham



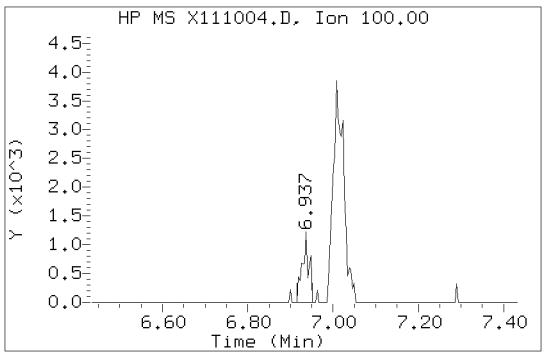
BEFORE

MASS
100
AREA
1334
HEIGHT
1226
17-Nov-2022
13:58
linh
pham



AFTER

MASS
100
AREA
1334
HEIGHT
1226
17-Nov-2022
14:02
linh
pham

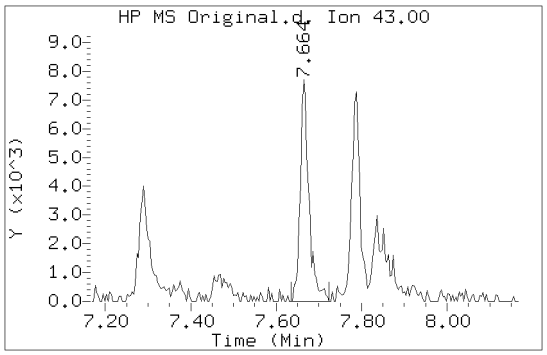


2-Hexanone (591-78-6)

Reason Code:

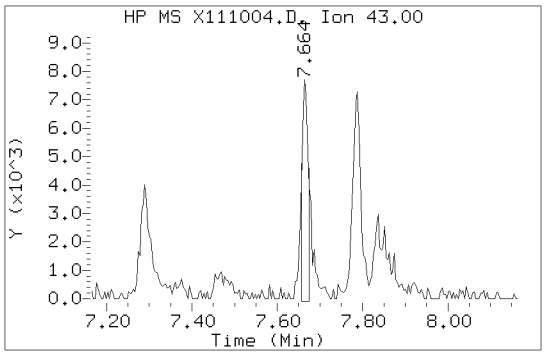
BEFORE

MASS
43
AREA
11264
HEIGHT
7704
17-Nov-2022
13:58
linh
pham



AFTER

MASS
43
AREA
7919
HEIGHT
7793
17-Nov-2022
14:02
linh
pham



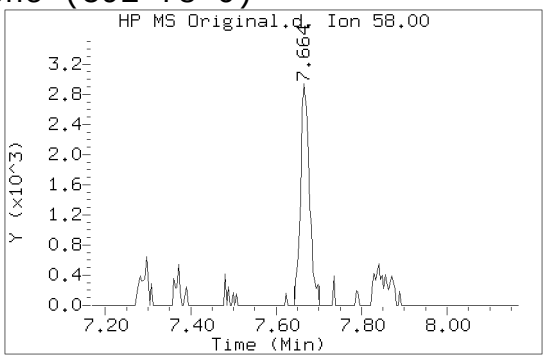
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

2-Hexanone (591-78-6)

Reason Code:

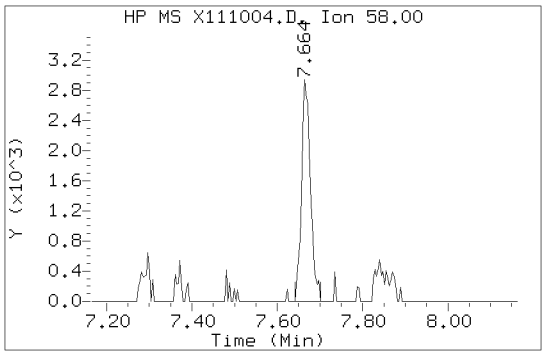
BEFORE

MASS
58
AREA
4401
HEIGHT
2941
17-Nov-2022
13:58
linh
pham



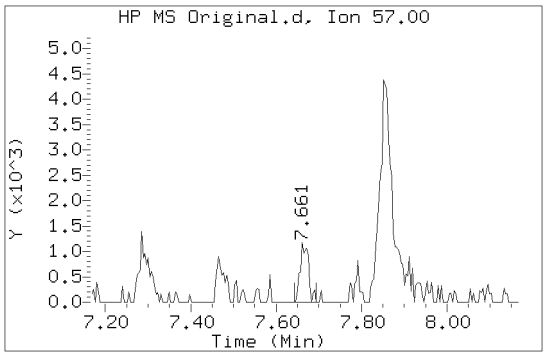
AFTER

MASS
58
AREA
4401
HEIGHT
2941
17-Nov-2022
14:02
linh
pham



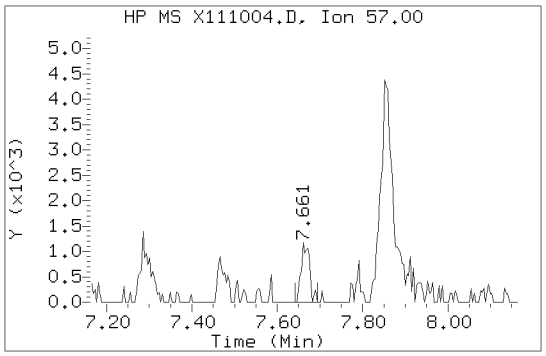
BEFORE

MASS
57
AREA
1644
HEIGHT
1184
17-Nov-2022
13:58
linh
pham



AFTER

MASS
57
AREA
1644
HEIGHT
1184
17-Nov-2022
14:02
linh
pham

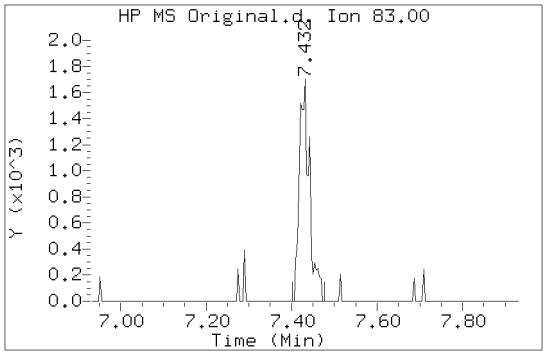


1,1,2-Trichloroethane (79-00-5)

Reason Code:

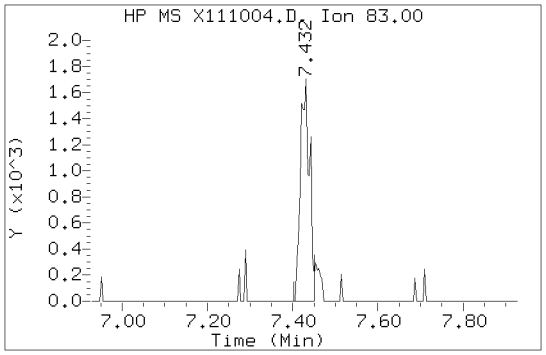
BEFORE

MASS
83
AREA
2850
HEIGHT
1705
17-Nov-2022
13:58
linh
pham



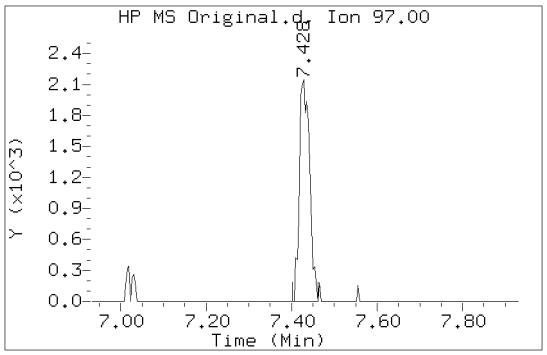
AFTER

MASS
83
AREA
2594
HEIGHT
1705
17-Nov-2022
14:02
linh
pham



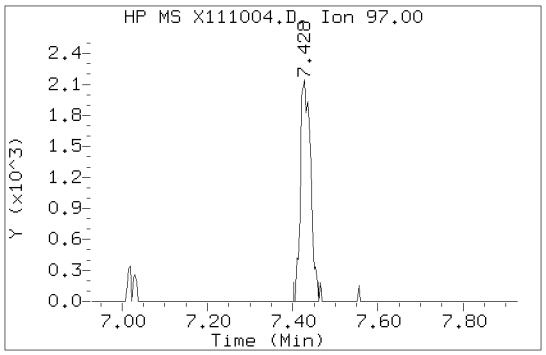
BEFORE

MASS
97
AREA
3656
HEIGHT
2146
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
3656
HEIGHT
2146
17-Nov-2022
14:02
linh
pham

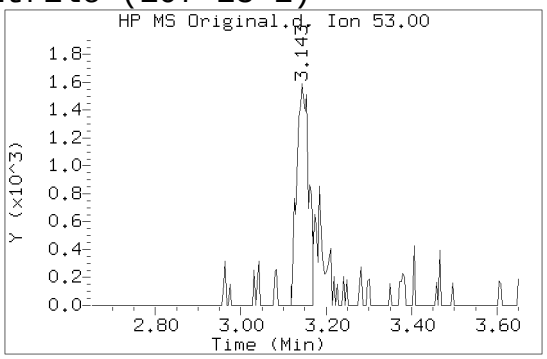


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

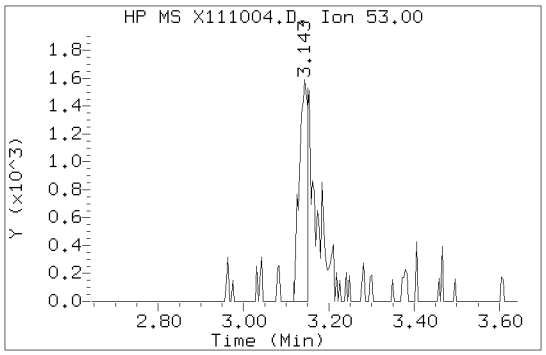
Acrylonitrile (107-13-1)

Reason Code:

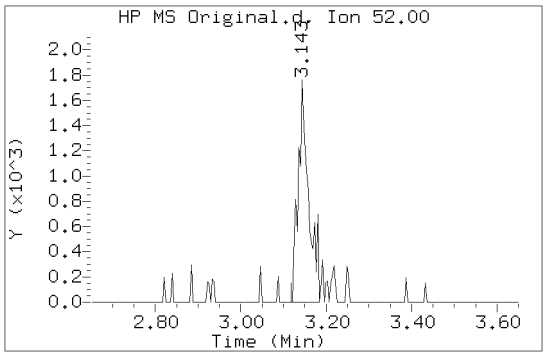
BEFORE
MASS
53
AREA
3196
HEIGHT
1590
17-Nov-2022
13:58
linh
pham



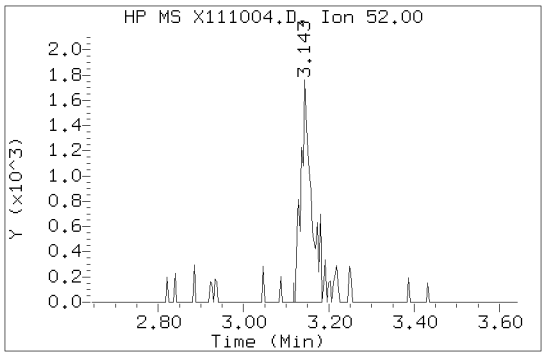
AFTER
MASS
53
AREA
2238
HEIGHT
1590
17-Nov-2022
14:02
linh
pham



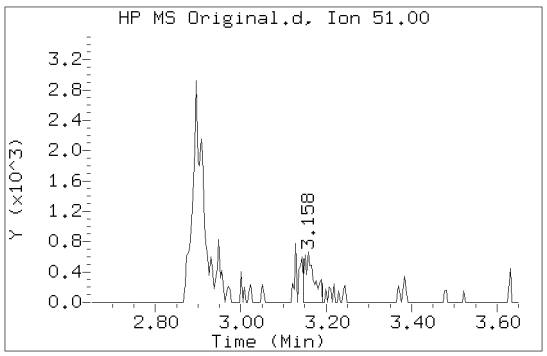
BEFORE
MASS
52
AREA
3061
HEIGHT
1762
17-Nov-2022
13:58
linh
pham



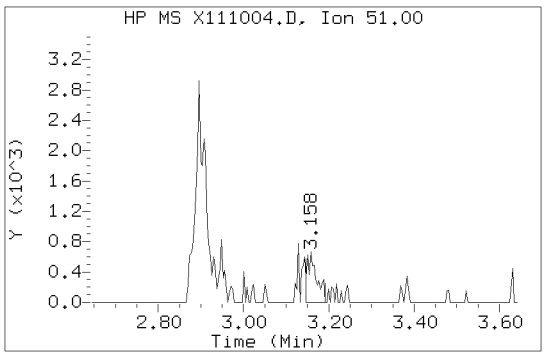
AFTER
MASS
52
AREA
3061
HEIGHT
1762
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
51
AREA
1009
HEIGHT
669
17-Nov-2022
13:58
linh
pham



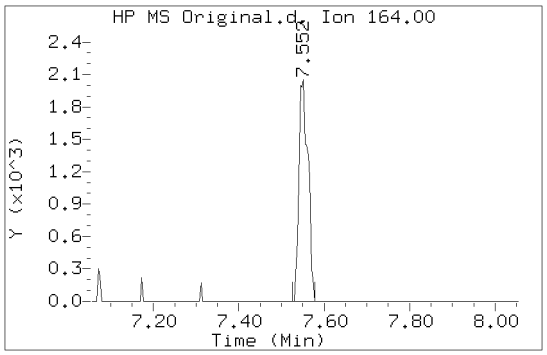
AFTER
MASS
51
AREA
1009
HEIGHT
669
17-Nov-2022
14:02
linh
pham



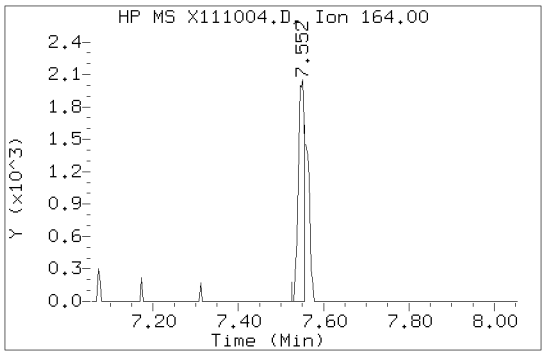
Tetrachloroethene (127-18-4)

Reason Code:

BEFORE
MASS
164
AREA
3119
HEIGHT
2052
17-Nov-2022
13:58
linh
pham



AFTER
MASS
164
AREA
2117
HEIGHT
2052
17-Nov-2022
14:02
linh
pham



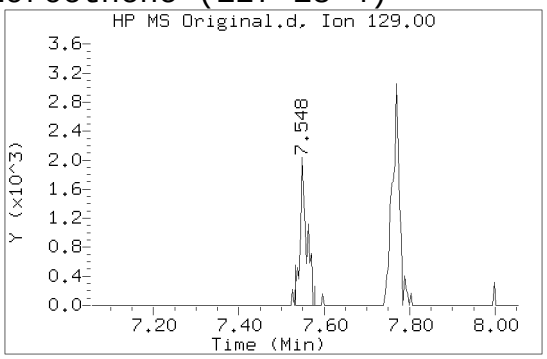
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Tetrachloroethene (127-18-4)

Reason Code:

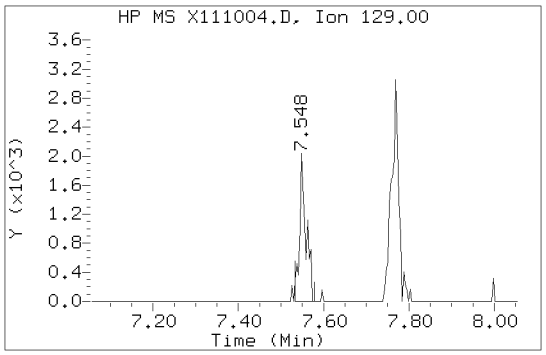
BEFORE

MASS
129
AREA
2226
HEIGHT
2044
17-Nov-2022
13:58
linh
pham



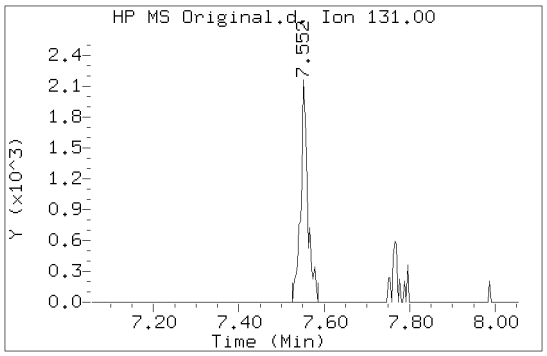
AFTER

MASS
129
AREA
2226
HEIGHT
2044
17-Nov-2022
14:02
linh
pham



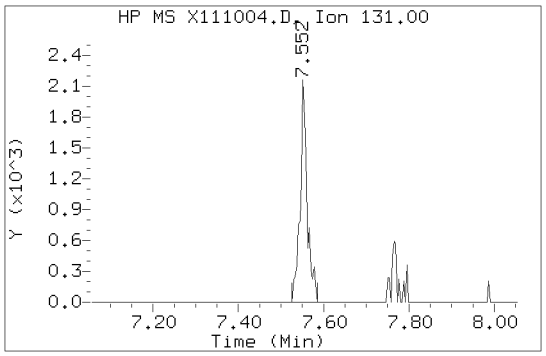
BEFORE

MASS
131
AREA
2526
HEIGHT
2160
17-Nov-2022
13:58
linh
pham



AFTER

MASS
131
AREA
2526
HEIGHT
2160
17-Nov-2022
14:02
linh
pham

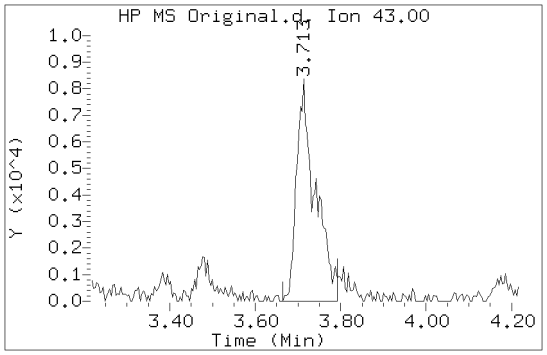


Vinyl Acetate (108-05-4)

Reason Code:

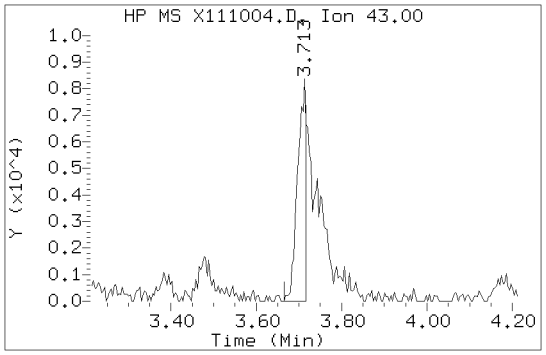
BEFORE

MASS
43
AREA
25636
HEIGHT
8370
17-Nov-2022
13:58
linh
pham



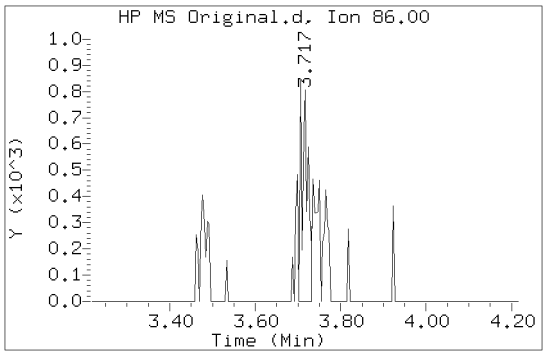
AFTER

MASS
43
AREA
11860
HEIGHT
8370
17-Nov-2022
14:02
linh
pham



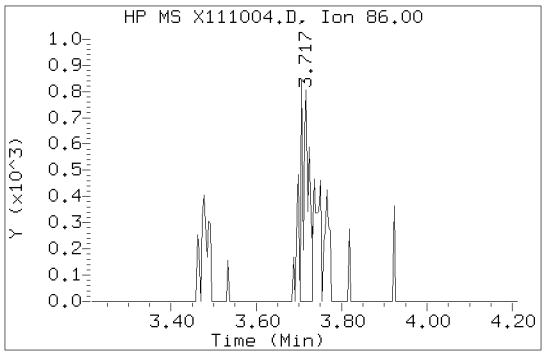
BEFORE

MASS
86
AREA
891
HEIGHT
806
17-Nov-2022
13:58
linh
pham



AFTER

MASS
86
AREA
891
HEIGHT
806
17-Nov-2022
14:02
linh
pham



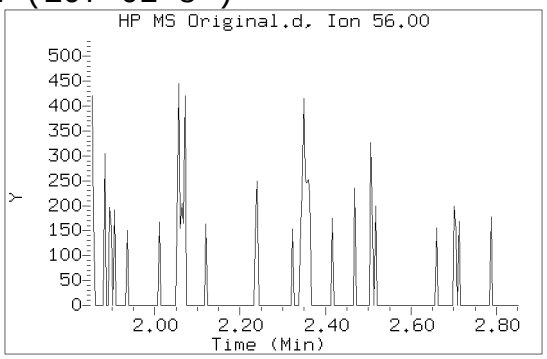
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Acrolein (107-02-8)

Reason Code:

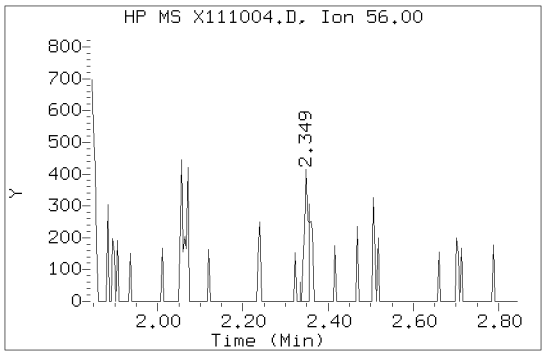
BEFORE

MASS
56
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



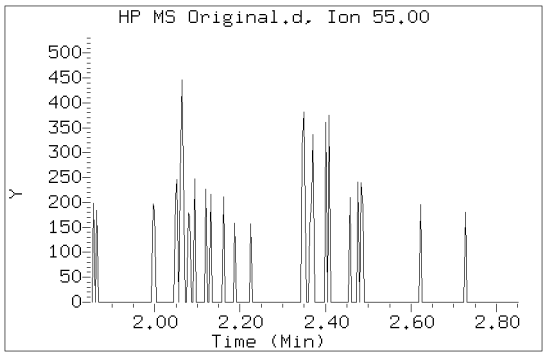
AFTER

MASS
56
AREA
293
HEIGHT
415
17-Nov-2022
14:02
linh
pham



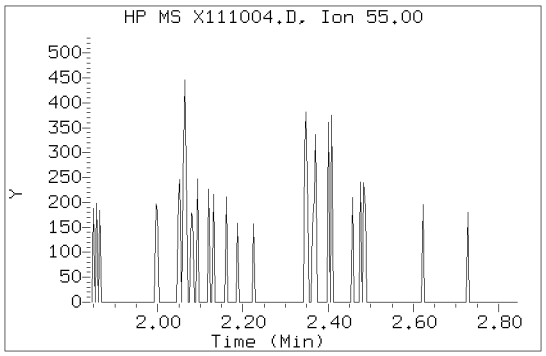
BEFORE

MASS
55
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
55
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

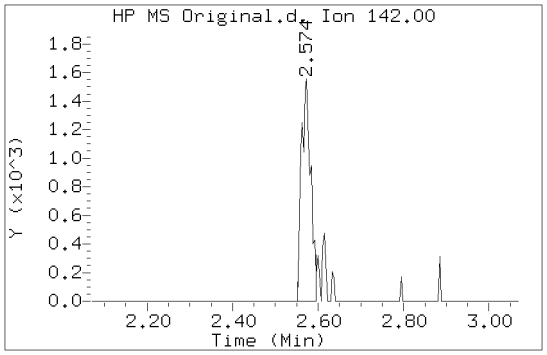


Iodomethane (74-88-4)

Reason Code:

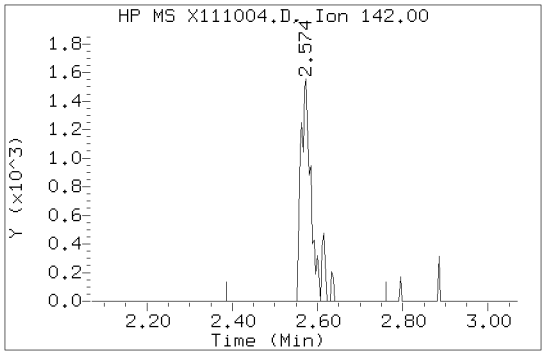
BEFORE

MASS
142
AREA
2418
HEIGHT
1555
17-Nov-2022
13:58
linh
pham



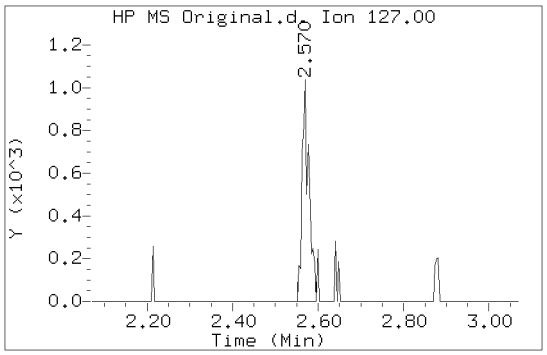
AFTER

MASS
142
AREA
2870
HEIGHT
1555
17-Nov-2022
14:02
linh
pham



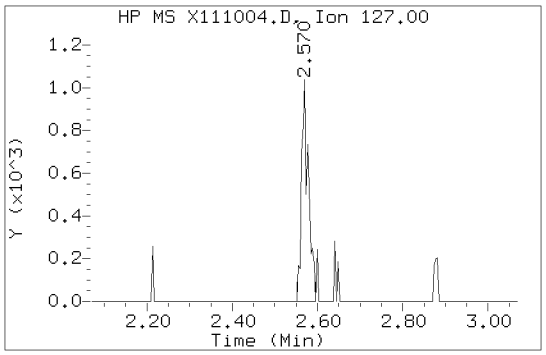
BEFORE

MASS
127
AREA
1191
HEIGHT
1037
17-Nov-2022
13:58
linh
pham



AFTER

MASS
127
AREA
1191
HEIGHT
1037
17-Nov-2022
14:02
linh
pham



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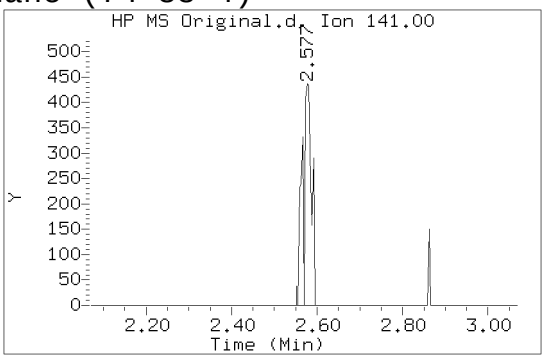
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Iodomethane (74-88-4)

Reason Code:

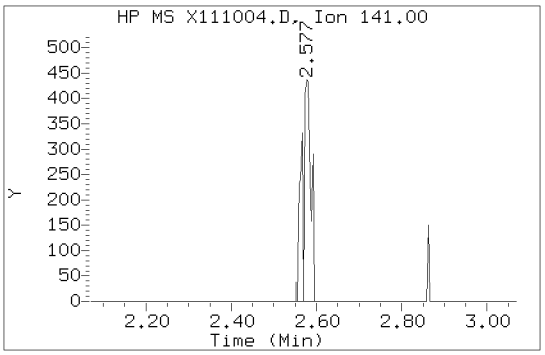
BEFORE

MASS
141
AREA
624
HEIGHT
437
17-Nov-2022
13:58
linh
pham



AFTER

MASS
141
AREA
624
HEIGHT
437
17-Nov-2022
14:02
linh
pham

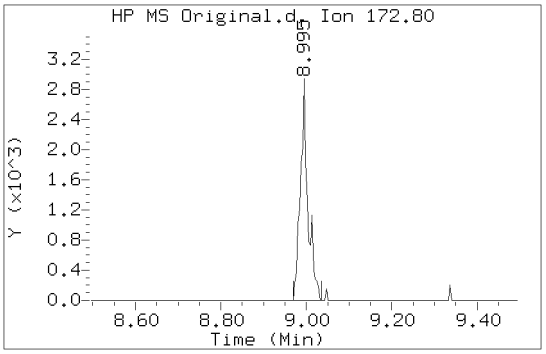


Bromoform (75-25-2)

Reason Code:

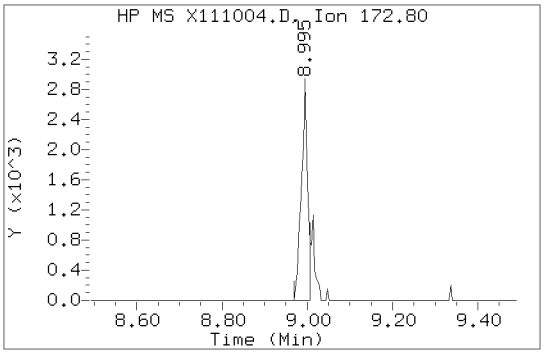
BEFORE

MASS
172.8
AREA
3722
HEIGHT
2943
17-Nov-2022
13:58
linh
pham



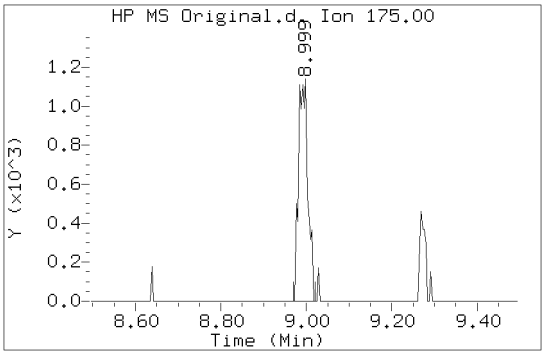
AFTER

MASS
172.8
AREA
3052
HEIGHT
2943
17-Nov-2022
14:02
linh
pham



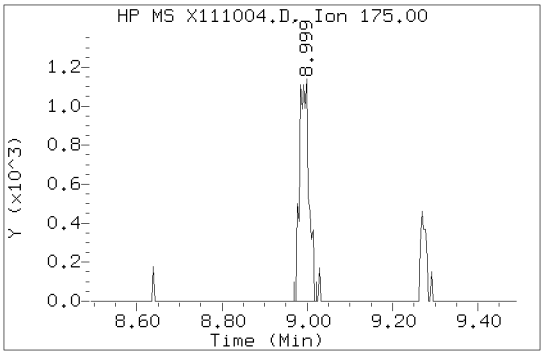
BEFORE

MASS
175
AREA
1782
HEIGHT
1140
17-Nov-2022
13:58
linh
pham



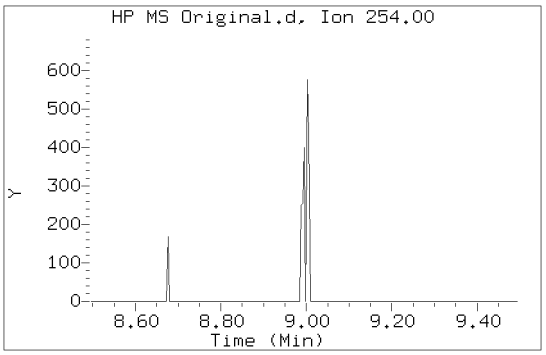
AFTER

MASS
175
AREA
1782
HEIGHT
1140
17-Nov-2022
14:02
linh
pham



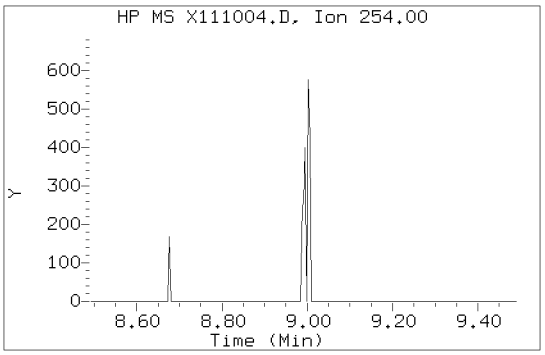
BEFORE

MASS
254
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
254
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



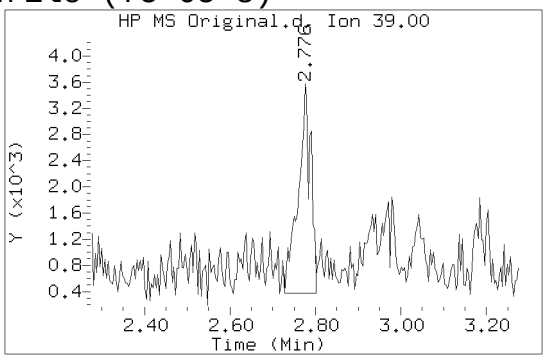
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Acetonitrile (75-05-8)

Reason Code:

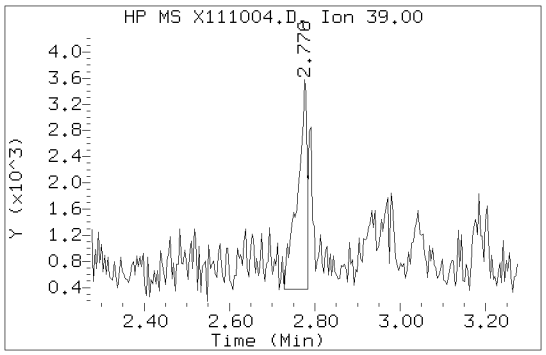
BEFORE

MASS
39
AREA
6680
HEIGHT
3204
17-Nov-2022
13:58
linh
pham



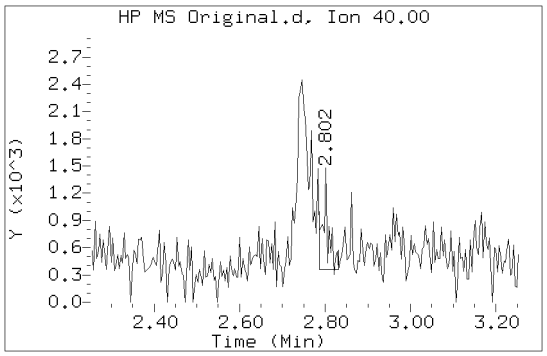
AFTER

MASS
39
AREA
5065
HEIGHT
3204
17-Nov-2022
14:02
linh
pham



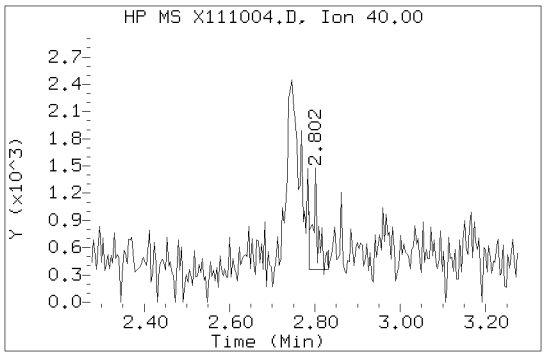
BEFORE

MASS
40
AREA
979
HEIGHT
1117
17-Nov-2022
13:58
linh
pham



AFTER

MASS
40
AREA
979
HEIGHT
1117
17-Nov-2022
14:02
linh
pham

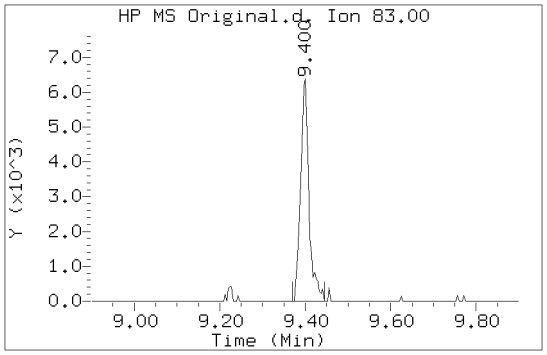


1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

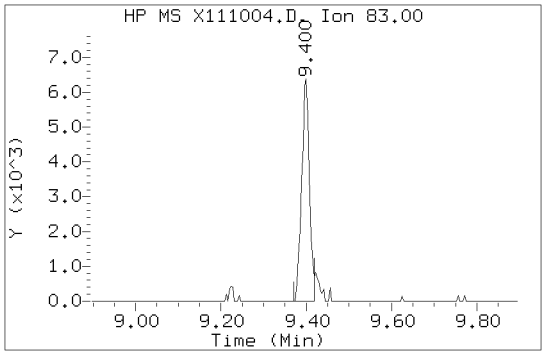
BEFORE

MASS
83
AREA
9005
HEIGHT
6383
17-Nov-2022
13:58
linh
pham



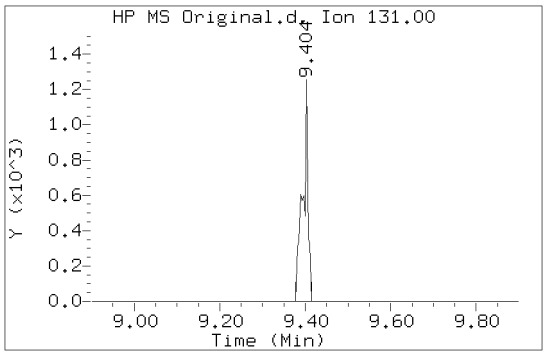
AFTER

MASS
83
AREA
8355
HEIGHT
6383
17-Nov-2022
14:02
linh
pham



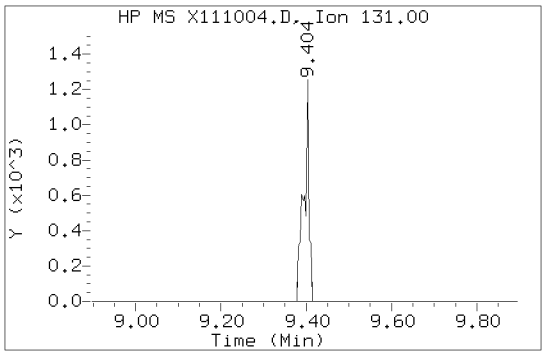
BEFORE

MASS
131
AREA
1088
HEIGHT
1255
17-Nov-2022
13:58
linh
pham



AFTER

MASS
131
AREA
1088
HEIGHT
1255
17-Nov-2022
14:02
linh
pham



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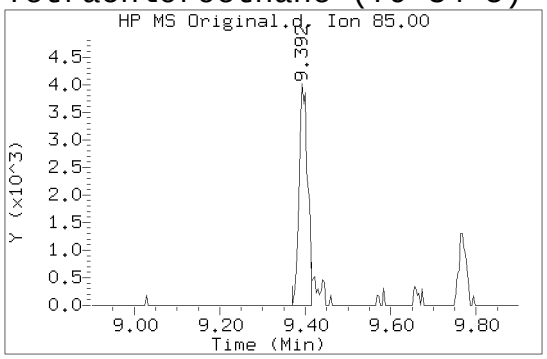
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

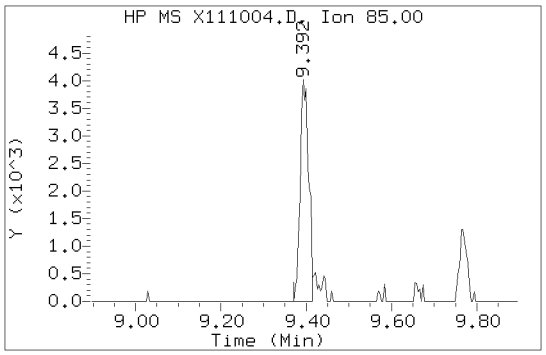
BEFORE

MASS
85
AREA
5728
HEIGHT
4017
17-Nov-2022
13:58
linh
pham



AFTER

MASS
85
AREA
5728
HEIGHT
4017
17-Nov-2022
14:02
linh
pham

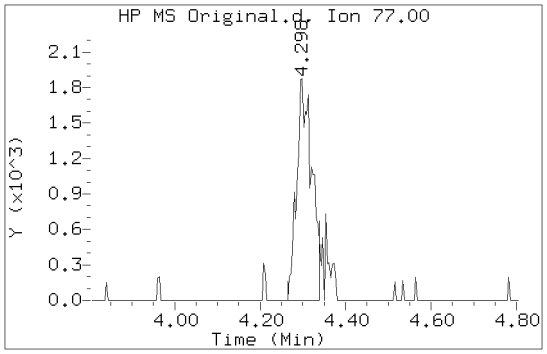


2,2-Dichloropropane (594-20-7)

Reason Code:

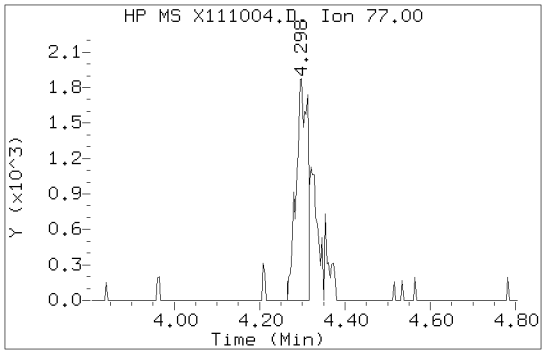
BEFORE

MASS
77
AREA
4716
HEIGHT
1875
17-Nov-2022
13:58
linh
pham



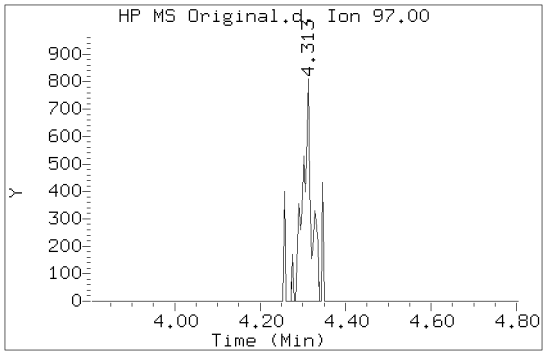
AFTER

MASS
77
AREA
3565
HEIGHT
1875
17-Nov-2022
14:02
linh
pham



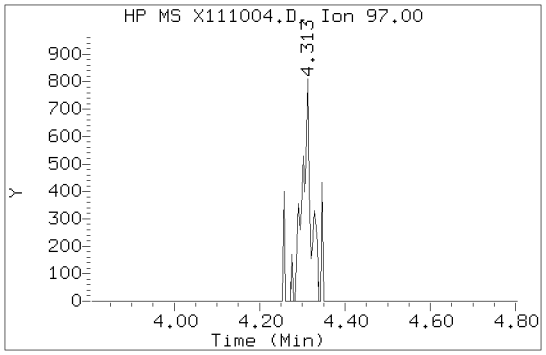
BEFORE

MASS
97
AREA
1164
HEIGHT
810
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
1164
HEIGHT
810
17-Nov-2022
14:02
linh
pham

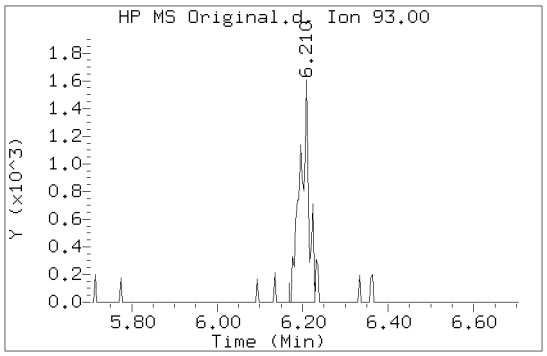


Dibromomethane (74-95-3)

Reason Code:

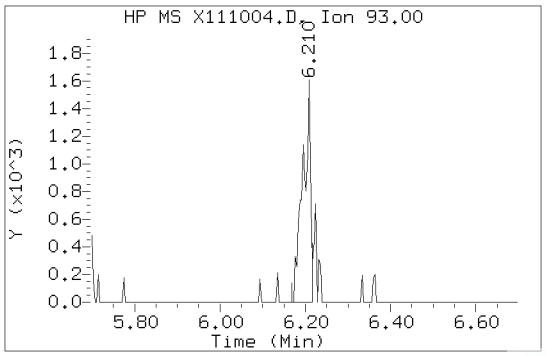
BEFORE

MASS
93
AREA
2323
HEIGHT
1607
17-Nov-2022
13:58
linh
pham



AFTER

MASS
93
AREA
2063
HEIGHT
1607
17-Nov-2022
14:02
linh
pham



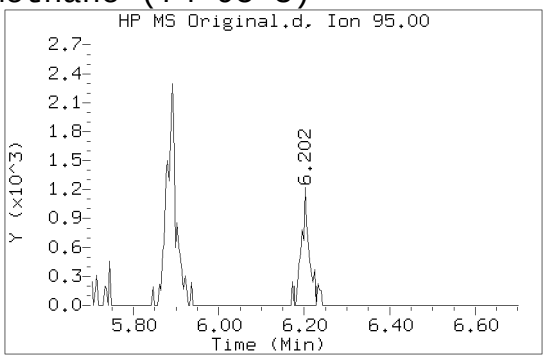
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Dibromomethane (74-95-3)

Reason Code:

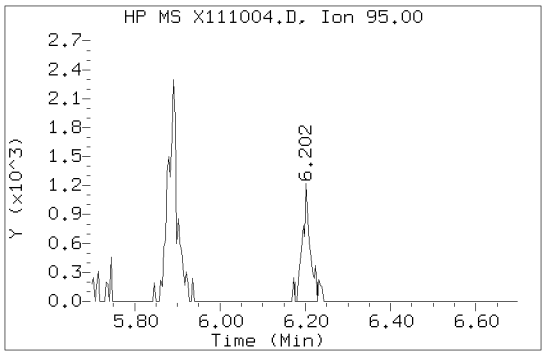
BEFORE

MASS
95
AREA
1511
HEIGHT
1223
17-Nov-2022
13:58
linh
pham



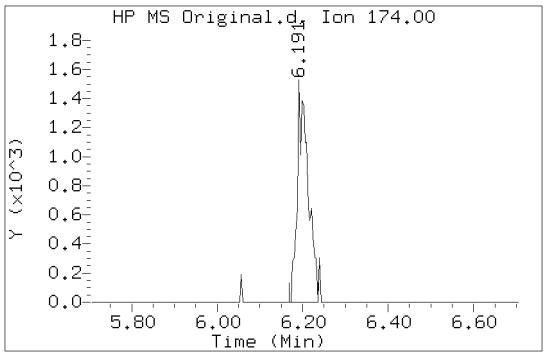
AFTER

MASS
95
AREA
1511
HEIGHT
1223
17-Nov-2022
14:02
linh
pham



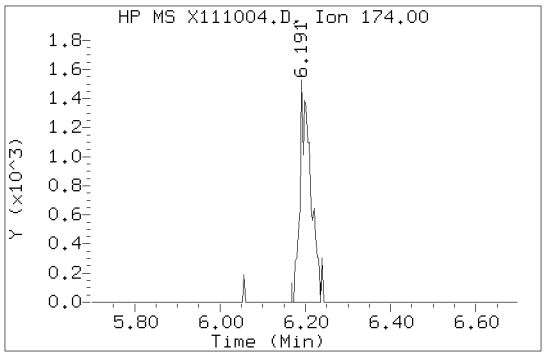
BEFORE

MASS
174
AREA
2717
HEIGHT
1528
17-Nov-2022
13:58
linh
pham



AFTER

MASS
174
AREA
2717
HEIGHT
1528
17-Nov-2022
14:02
linh
pham

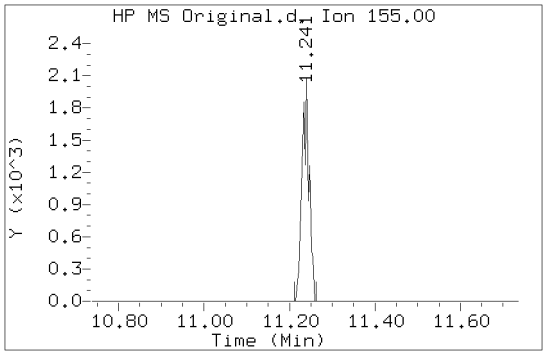


1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

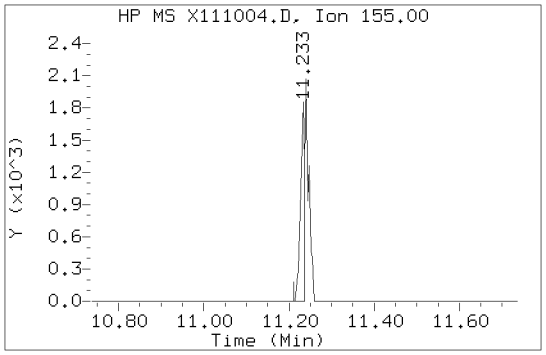
BEFORE

MASS
155
AREA
2434
HEIGHT
2071
17-Nov-2022
13:58
linh
pham



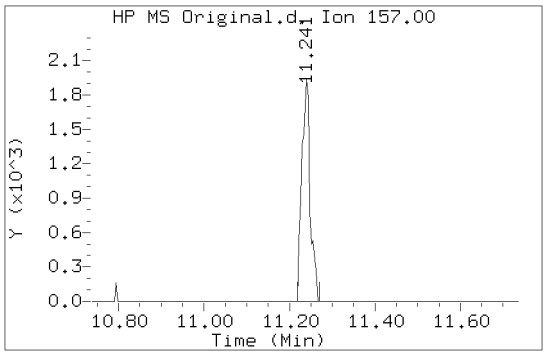
AFTER

MASS
155
AREA
1276
HEIGHT
1857
17-Nov-2022
14:02
linh
pham



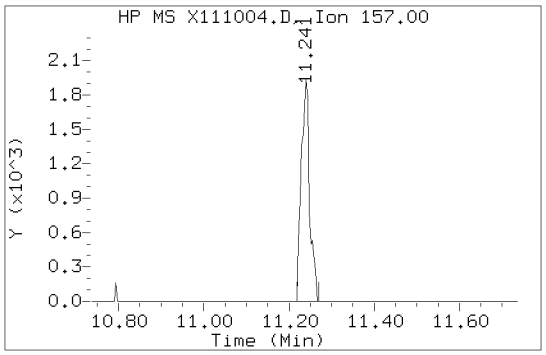
BEFORE

MASS
157
AREA
2718
HEIGHT
1934
17-Nov-2022
13:58
linh
pham



AFTER

MASS
157
AREA
2718
HEIGHT
1934
17-Nov-2022
14:02
linh
pham



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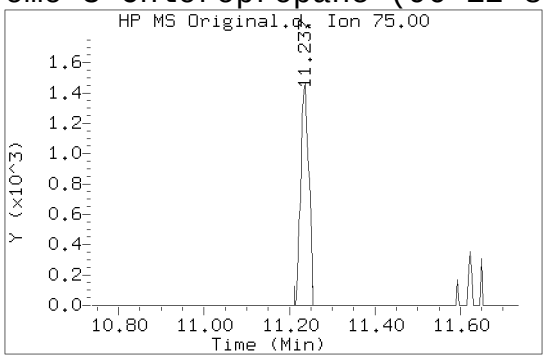
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

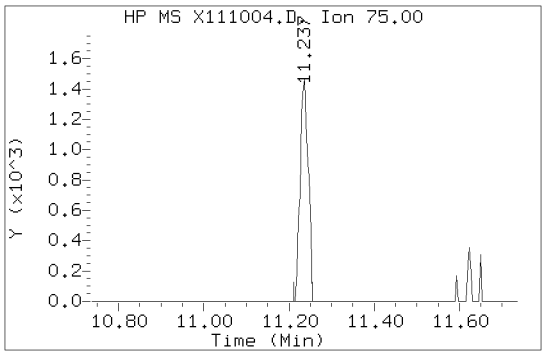
BEFORE

MASS
75
AREA
2005
HEIGHT
1461
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
2005
HEIGHT
1461
17-Nov-2022
14:02
linh
pham

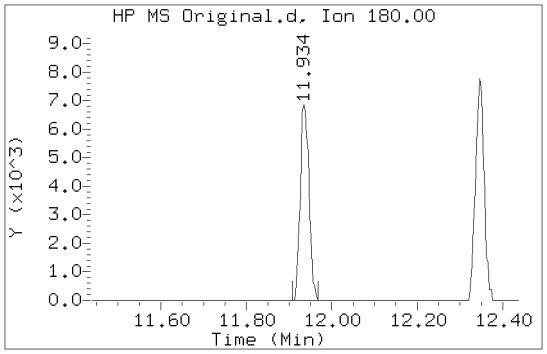


1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

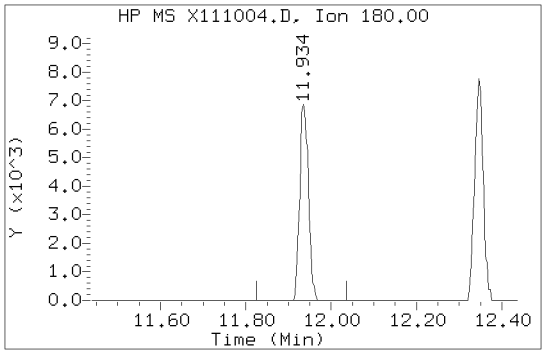
BEFORE

MASS
180
AREA
10117
HEIGHT
6878
17-Nov-2022
13:58
linh
pham



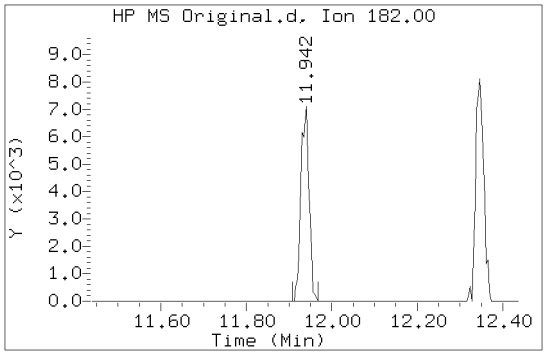
AFTER

MASS
180
AREA
10119
HEIGHT
6878
17-Nov-2022
14:02
linh
pham



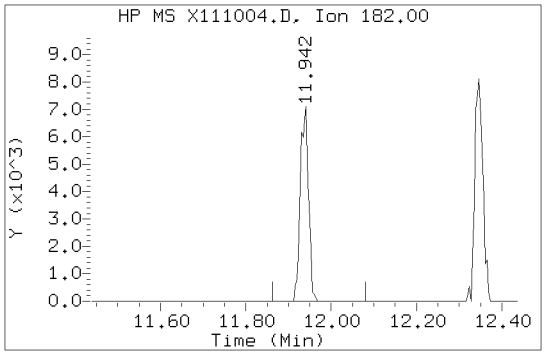
BEFORE

MASS
182
AREA
9793
HEIGHT
7098
17-Nov-2022
13:58
linh
pham



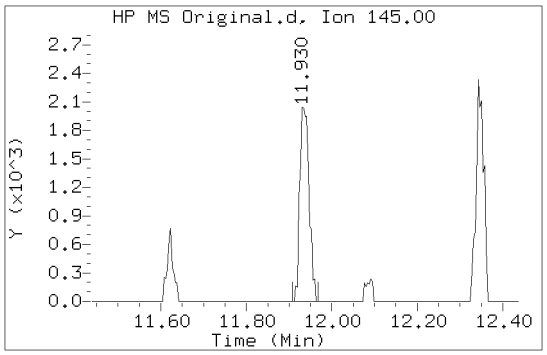
AFTER

MASS
182
AREA
9794
HEIGHT
7098
17-Nov-2022
14:02
linh
pham



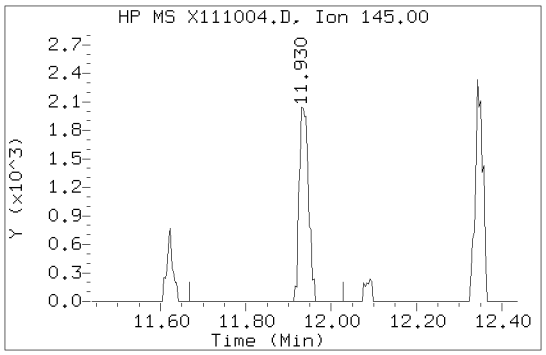
BEFORE

MASS
145
AREA
3194
HEIGHT
2047
17-Nov-2022
13:58
linh
pham



AFTER

MASS
145
AREA
3194
HEIGHT
2047
17-Nov-2022
14:02
linh
pham



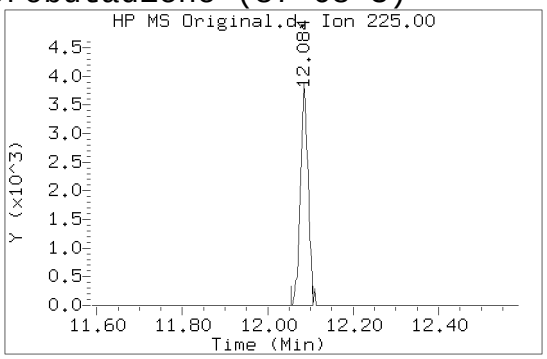
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111004.D
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Hexachlorobutadiene (87-68-3)

Reason Code:

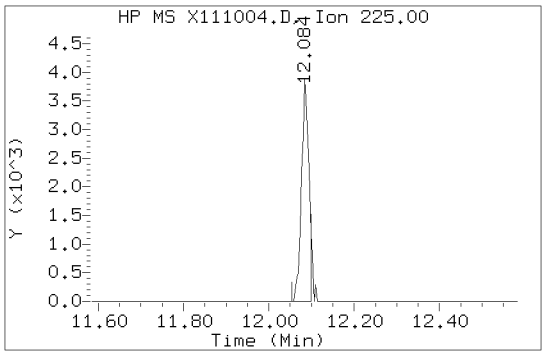
BEFORE

MASS
225
AREA
4945
HEIGHT
3871
17-Nov-2022
13:58
linh
pham



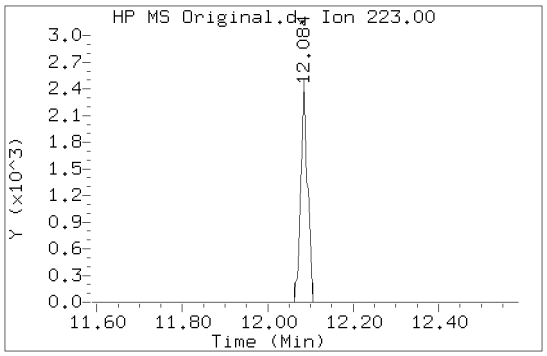
AFTER

MASS
225
AREA
4764
HEIGHT
3871
17-Nov-2022
14:02
linh
pham



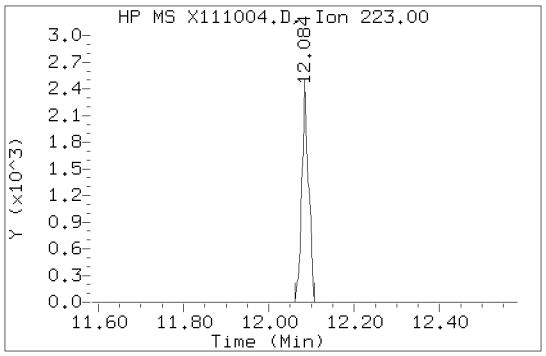
BEFORE

MASS
223
AREA
2816
HEIGHT
2502
17-Nov-2022
13:58
linh
pham



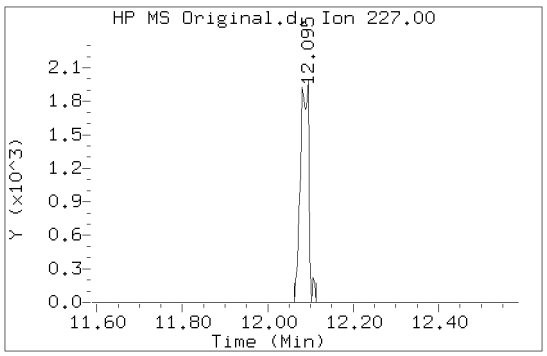
AFTER

MASS
223
AREA
2816
HEIGHT
2502
17-Nov-2022
14:02
linh
pham



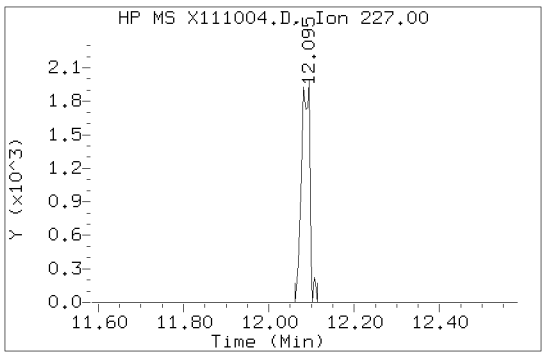
BEFORE

MASS
227
AREA
2816
HEIGHT
1984
17-Nov-2022
13:58
linh
pham



AFTER

MASS
227
AREA
2816
HEIGHT
1984
17-Nov-2022
14:02
linh
pham



1,2,3-Trichlorobenzene (87-61-6)

Reason Code:

BEFORE

MASS
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AREA
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HEIGHT
7771
17-Nov-2022
13:58
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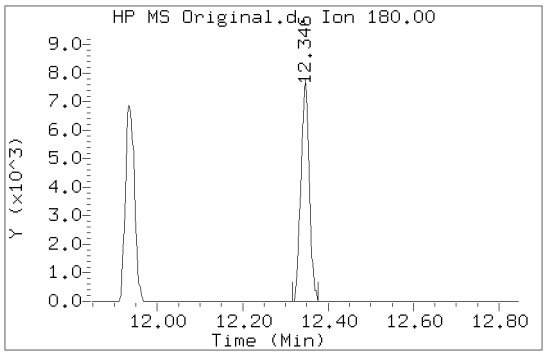
pham



AFTER

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AREA
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14:02
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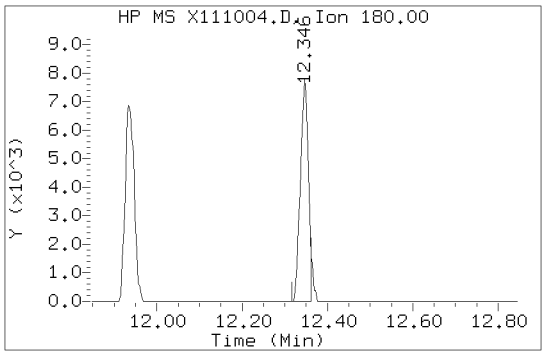

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Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

1,2,3-Trichlorobenzene (87-61-6)

Reason Code:

BEFORE
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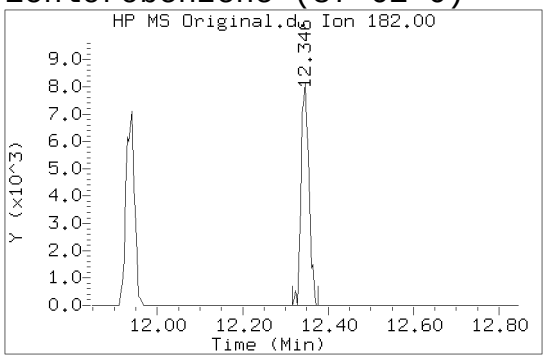
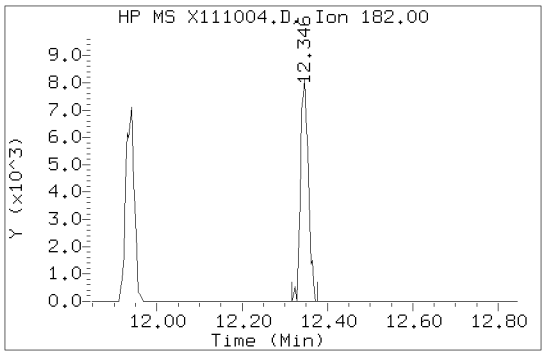
AREA
10761
HEIGHT
8110
17-Nov-2022
13:58
linh
pham



AFTER
MASS
182
AREA
10761
HEIGHT
8110
17-Nov-2022
14:02
linh
pham



BEFORE
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AREA
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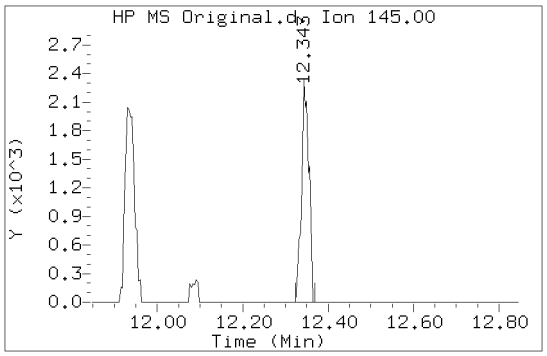
HEIGHT
2333
17-Nov-2022
13:58
linh
pham



AFTER
MASS
145
AREA
2877
HEIGHT
2333
17-Nov-2022
14:02
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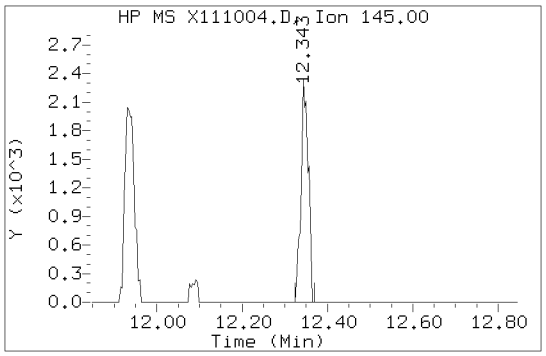
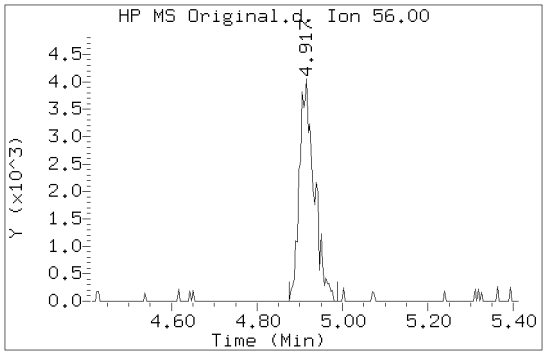


Cyclohexane (110-82-7)

Reason Code:

BEFORE
MASS
56
AREA
9912
HEIGHT
4052
17-Nov-2022
13:58
linh
pham



AFTER
MASS
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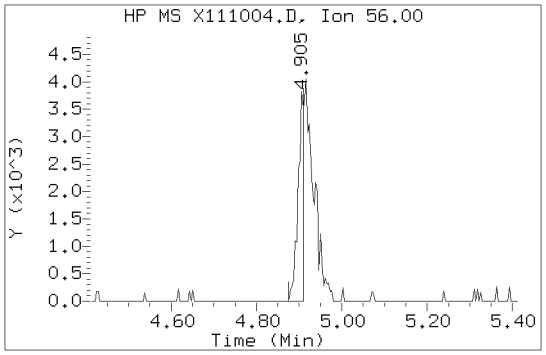
AREA
3454
HEIGHT
3823
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
84
AREA
10245
HEIGHT
5243
17-Nov-2022
13:58
linh
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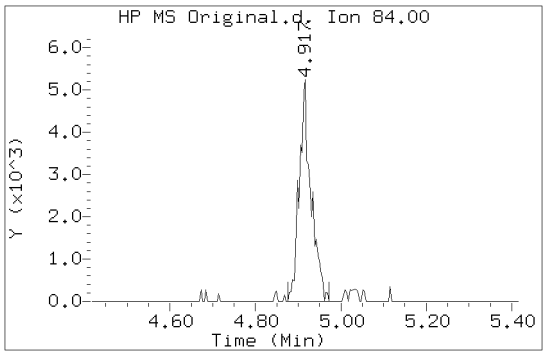

AFTER
MASS
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AREA
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HEIGHT
5243
17-Nov-2022
14:02
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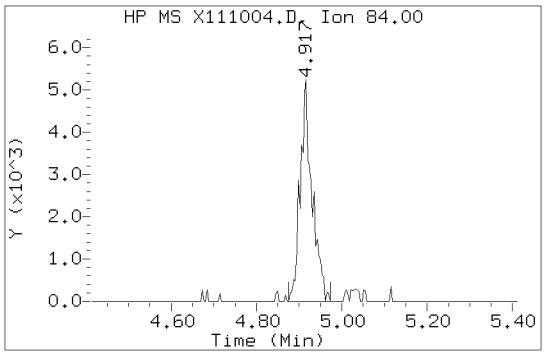

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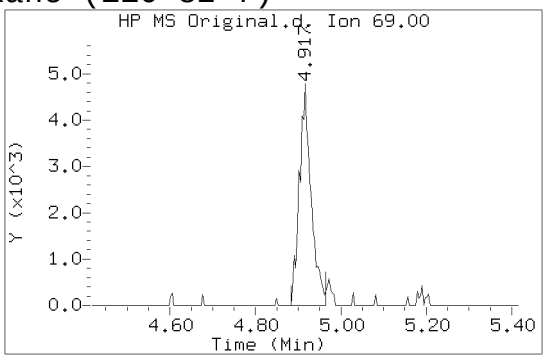
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Cyclohexane (110-82-7)

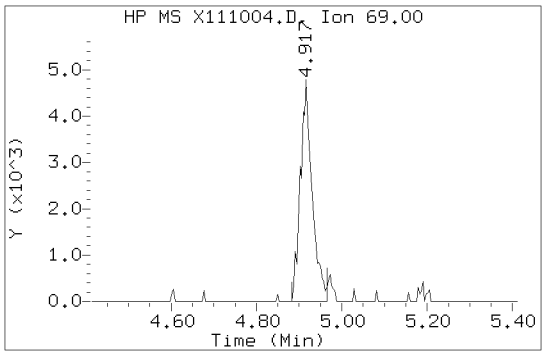
BEFORE

MASS
69
AREA
9331
HEIGHT
4787
17-Nov-2022
13:58
linh
pham



AFTER

MASS
69
AREA
9331
HEIGHT
4787
17-Nov-2022
14:02
linh
pham

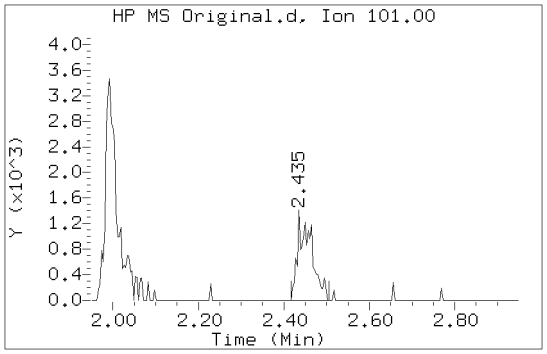


Reason Code:

Freon TF (76-13-1)

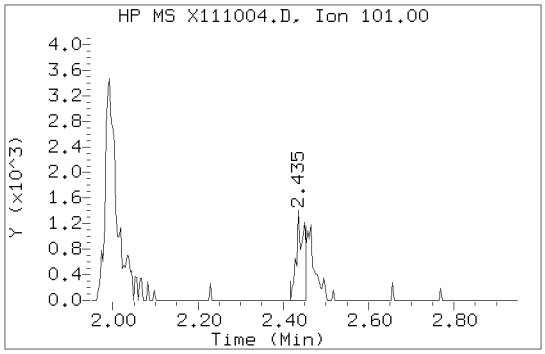
BEFORE

MASS
101
AREA
3184
HEIGHT
1418
17-Nov-2022
13:58
linh
pham



AFTER

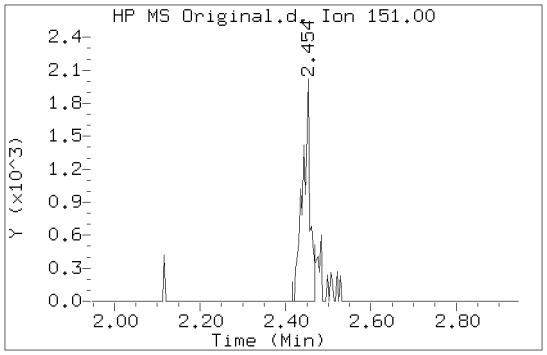
MASS
101
AREA
1766
HEIGHT
1418
17-Nov-2022
14:02
linh
pham



Reason Code:

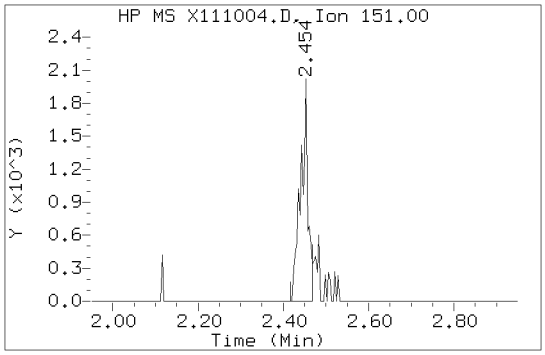
BEFORE

MASS
151
AREA
2463
HEIGHT
2021
17-Nov-2022
13:58
linh
pham



AFTER

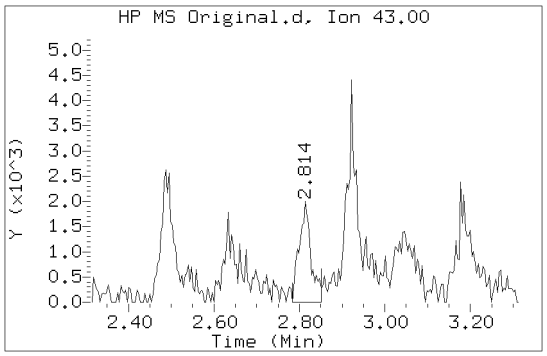
MASS
151
AREA
2463
HEIGHT
2021
17-Nov-2022
14:02
linh
pham



Methyl Acetate (79-20-9)

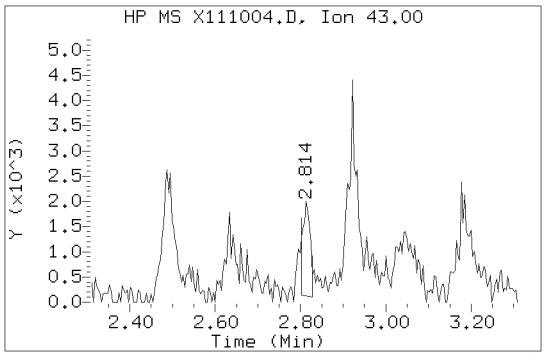
BEFORE

MASS
43
AREA
3918
HEIGHT
2005
17-Nov-2022
13:58
linh
pham



AFTER

MASS
43
AREA
2351
HEIGHT
1880
17-Nov-2022
14:02
linh
pham



Reason Code:

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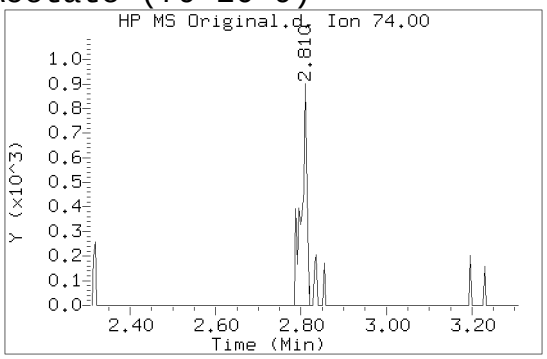
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

Methyl Acetate (79-20-9)

Reason Code:

BEFORE

MASS
74
AREA
857
HEIGHT
901
17-Nov-2022
13:58
linh
pham



AFTER

MASS
74
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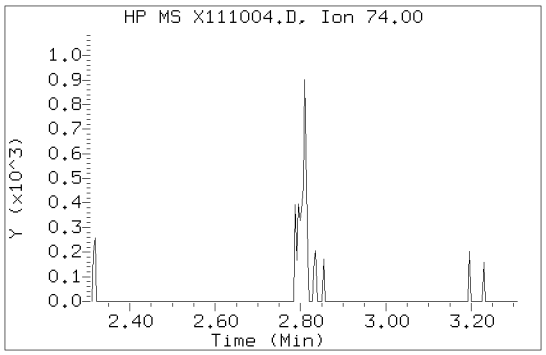
HEIGHT
0
17-Nov-2022
14:02
linh
pham

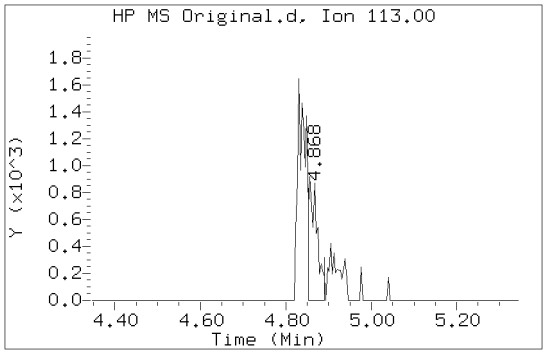


Dibromofluoromethane (1868-53-7)

Reason Code:

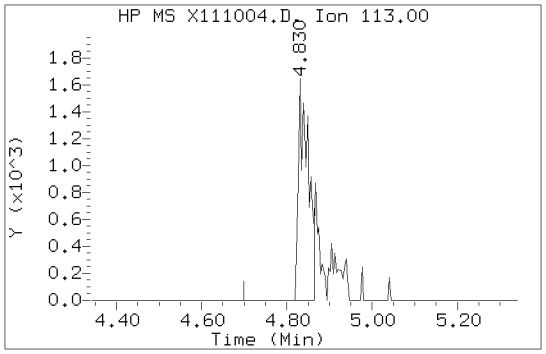
BEFORE

MASS
113
AREA
1262
HEIGHT
869
17-Nov-2022
13:58
linh
pham



AFTER

MASS
113
AREA
2689
HEIGHT
1646
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
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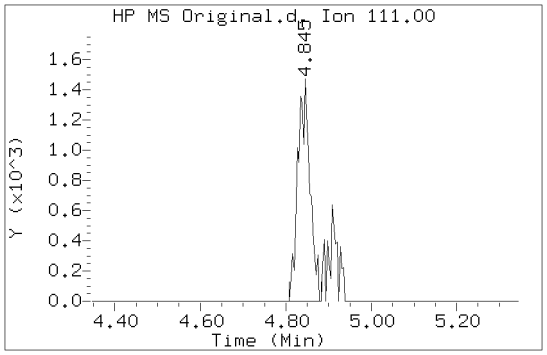
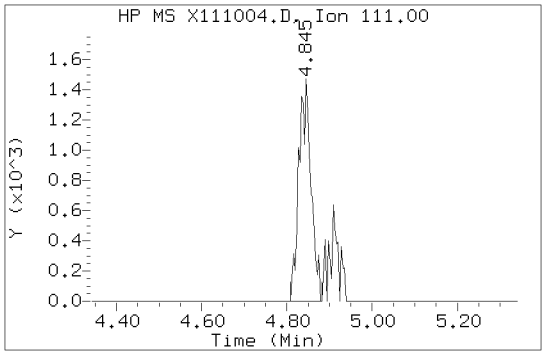
AREA
2957
HEIGHT
1472
17-Nov-2022
13:58
linh
pham



AFTER

MASS
111
AREA
2957
HEIGHT
1472
17-Nov-2022
14:02
linh
pham



1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

BEFORE

MASS
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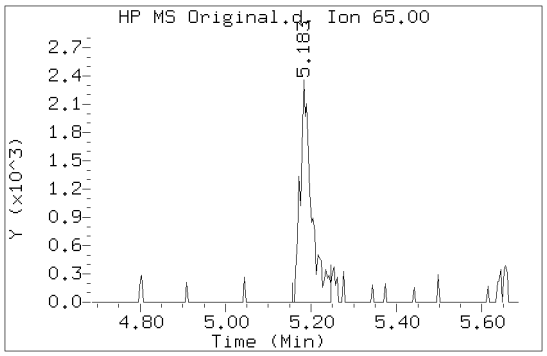
AREA
4459
HEIGHT
2358
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
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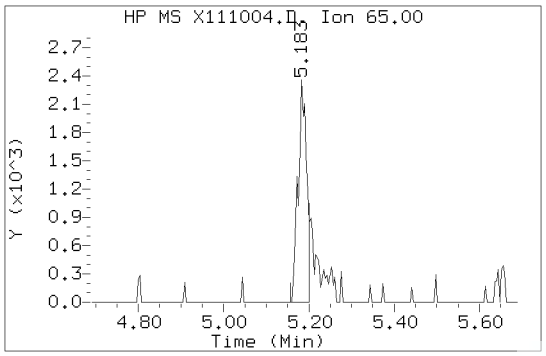
HEIGHT
2358
17-Nov-2022
14:02
linh
pham



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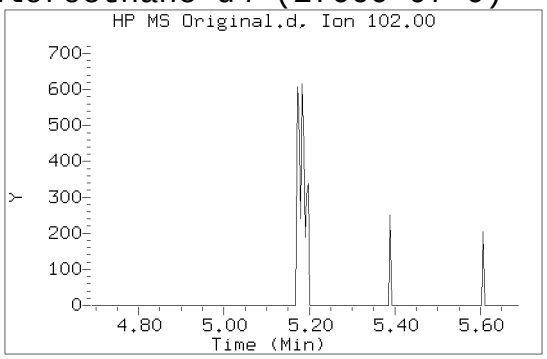
Inj Date : 10-NOV-2022 14:15
InstruID : voa10.i
LabSampID : VSTD001

1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

BEFORE

MASS
102
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
102
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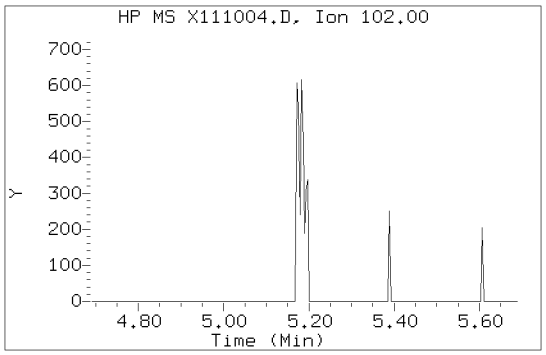
HEIGHT
0
17-Nov-2022
14:02
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D Page 1
Report Date: 17-Nov-2022 14:02

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Lab Smp Id: VSTD002 Client Smp ID: VSTD002
Inj Date : 10-NOV-2022 14:35
Operator : FT Inst ID: voa10.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:02 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 14:15 Cal File: X111004.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	440869	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	7397	2.00000	1.95(M)
3	Chloromethane	50	1.370	1.370	(0.279)	8479	2.00000	2.05(M)
5	Vinyl Chloride	62	1.452	1.452	(0.295)	7728	2.00000	1.88(M)
6	Bromomethane	94	1.711	1.711	(0.348)	3868	2.00000	2.09(M)
7	Chloroethane	64	1.782	1.782	(0.363)	4394	2.00000	1.86(M)
8	Trichlorofluoromethane	101	1.992	1.992	(0.405)	11059	2.00000	2.05(M)
9	Acrolein	56	2.360	2.360	(0.480)	599	4.00000	1.66(M)
10	Acetone	43	2.491	2.491	(0.507)	11188	4.00000	1.09
12	Isobutyl Alcohol	43	5.377	5.377	(1.094)	27284	40.0000	39.69
13	Acetonitrile	39	2.772	2.772	(0.564)	12765	20.0000	20.69
16	Acrylonitrile	53	3.147	3.147	(0.640)	6787	4.00000	4.17(M)
11	1,1-Dichloroethene	96	2.442	2.442	(0.497)	6127	2.00000	1.46(M)
15	Iodomethane	142	2.573	2.573	(0.523)	8375	4.00000	6.67(M)
17	Methylene Chloride	84	2.896	2.896	(0.589)	9066	2.00000	(M)
18	Methyl tert-butyl ether	73	3.203	3.203	(0.652)	21785	2.00000	1.93
19	Carbon Disulfide	76	2.633	2.633	(0.536)	39423	4.00000	4.39
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	6362	2.00000	1.88
22	1,1-Dichloroethane	63	3.634	3.634	(0.739)	14716	2.00000	1.92
24	2-Butanone	43	4.346	4.346	(0.884)	9107	4.00000	3.98(M)

27 cis-1,2-Dichloroethene	96	4.305	4.305 (0.876)	8625	2.00000	2.15(M)
28 Chloroform	83	4.672	4.672 (0.950)	16011	2.00000	2.21(M)

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D Page 2
Report Date: 17-Nov-2022 14:02

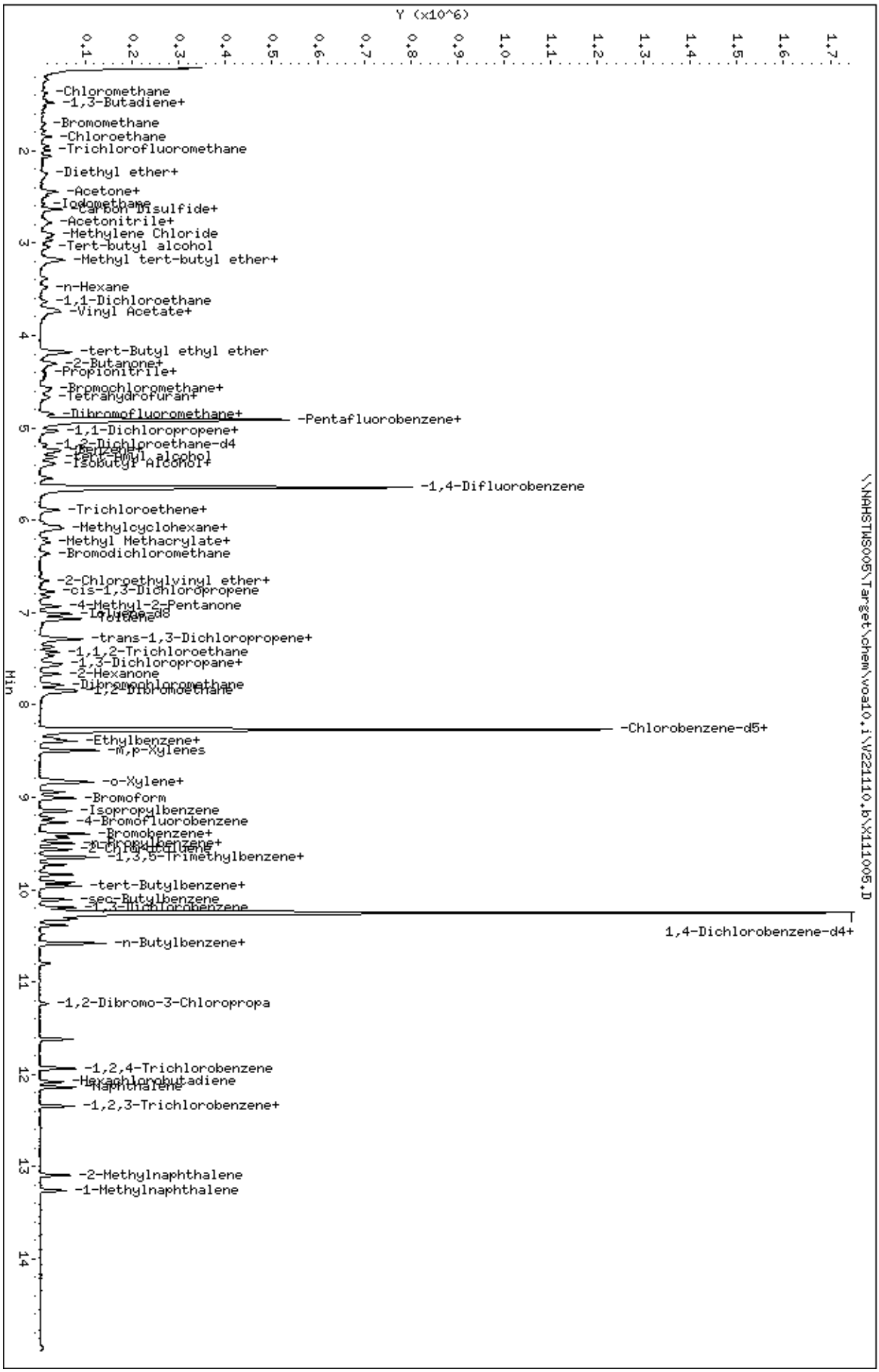
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.564	4.564	(0.928)	4346	2.00000	2.16(M)
$	30 Dibromofluoromethane	113	4.837	4.837	(0.984)	7833	2.00000	2.10(M)
	31 1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	13178	2.00000	2.26(M)
	32 1,1-Dichloropropene	75	5.029	5.029	(0.890)	10760	2.00000	2.04(M)
	33 1,2-Dichloroethane	62	5.268	5.268	(0.933)	13774	2.00000	2.18(M)
	34 Carbon Tetrachloride	117	5.029	5.029	(0.890)	8603	2.00000	1.88(MH)
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	9368	2.00000	1.98(M)
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	683114	50.0000	
	37 Benzene	78	5.238	5.238	(0.928)	38182	2.00000	2.19
	38 Trichloroethene	130	5.887	5.887	(1.042)	9460	2.00000	2.12
	39 Bromodichloromethane	83	6.356	6.356	(1.125)	11558	2.00000	2.13(M)
	42 1,2-Dichloropropane	63	6.101	6.101	(1.080)	10678	2.00000	2.19(M)
	45 4-Methyl-2-Pentanone	43	6.933	6.933	(0.839)	29360	4.00000	7.99(M)
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.199)	15879	2.00000	2.19
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	611790	50.0000	
$	48 Toluene-d8	98	7.012	7.012	(0.848)	30061	2.00000	2.21
	50 Toluene	91	7.072	7.072	(0.855)	37286	2.00000	2.06
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.287)	13844	2.00000	2.17
	52 2-Hexanone	43	7.668	7.668	(0.927)	21835	4.00000	7.13(M)
	53 1,1,2-Trichloroethane	83	7.431	7.431	(0.899)	8032	2.00000	2.22(M)
	54 1,3-Dichloropropane	76	7.570	7.570	(0.916)	16027	2.00000	2.16(M)
	55 Dibromochloromethane	129	7.773	7.773	(0.940)	10308	2.00000	2.18
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	7683	2.00000	2.05(M)
	57 1,2-Dibromoethane	107	7.859	7.859	(0.951)	10596	2.00000	2.39
	59 Chlorobenzene	112	8.294	8.294	(1.003)	27136	2.00000	2.20
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	9769	2.00000	2.21(M)
	61 Ethylbenzene	106	8.391	8.391	(1.015)	12090	2.00000	2.00
	62 m,p-Xylenes	106	8.492	8.492	(1.027)	31533	4.00000	4.24
	63 o-Xylene	106	8.830	8.830	(1.068)	16334	2.00000	2.20
	64 Styrene	104	8.841	8.841	(1.069)	29214	2.00000	2.17
	66 Bromoform	173	8.995	8.995	(1.088)	8918	2.00000	3.60(TM)
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	38429	2.00000	2.08
	68 1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	19087	2.00000	2.78(M)
$	69 4-Bromofluorobenzene	95	9.268	9.268	(1.121)	15006	2.00000	3.36(M)
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	394854	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.643	9.643	(0.941)	32804	2.00000	2.03
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	28195	2.00000	2.03
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	36318	2.00000	2.07
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	38618	2.00000	1.98
	87 n-Butylbenzene	91	10.573	10.573	(1.031)	33253	2.00000	1.95
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	44773	2.00000	2.07
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	20865	2.00000	2.48(M)
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	28057	2.00000	2.32(M)
	84 1,4-Dichlorobenzene	146	10.269	10.269	(1.002)	30465	2.00000	3.20
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	27258	2.00000	2.46(M)
	89 1,2-Dibromo-3-Chloropropane	155	11.240	11.240	(1.097)	2803	2.00000	2.29(M)
	90 1,2,4-Trichlorobenzene	180	11.937	11.937	(1.165)	21248	2.00000	2.58(M)
	92 Naphthalene	128	12.143	12.143	(1.185)	50787	2.00000	2.28
	136 n-Hexane	57	3.484	3.484	(0.709)	8011	2.00000	1.73
	147 Methylcyclohexane	55	6.067	6.067	(1.074)	14253	2.00000	2.27
	141 Cyclohexane	56	4.905	4.905	(0.998)	8459	2.00000	1.49(M)
	138 Freon TF	101	2.446	2.446	(0.498)	5610	2.00000	1.62(M)

146	Methyl Acetate	43	2.806	2.806 (0.571)	7599	2.00000	2.10
21	Vinyl Acetate	43	3.713	3.713 (0.755)	33717	4.00000	3.77

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	10868	2.00000	2.03(M)
	44 Dibromomethane	93	6.198	6.198	(1.098)	5896	2.00000	2.11(M)
	91 Hexachlorobutadiene	225	12.084	12.084	(1.179)	8250	2.00000	1.43
	74 Bromobenzene	156	9.399	9.399	(0.917)	14736	2.00000	2.44
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	33419	2.00000	3.75
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	38071	2.00000	2.26(M)
	82 p-Isopropyltoluene	119	10.235	10.235	(0.999)	34884	2.00000	1.96
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	21009	2.00000	2.47
	148 tert-Butyl Alcohol	59	3.042	3.042	(0.619)	26653	40.0000	48.26
	142 Tetrahydrofuran	42	4.650	4.650	(0.946)	4340	4.00000	4.79
M	94 1,2-Dichloroethylene (total)	96				14987	4.00000	
M	95 Xylenes (total)	106				47867	6.00000	

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Date : 10-NOV-2022 14:35
Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624

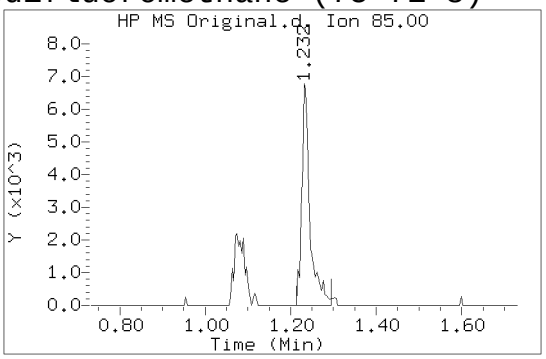
Instrument: voa10,i
Operator: FT
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Dichlorodifluoromethane (75-71-8)

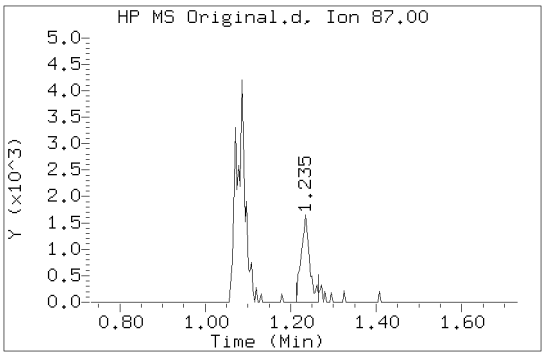
BEFORE

MASS
85
AREA
9313
HEIGHT
6784
17-Nov-2022
13:58
linh
pham



BEFORE

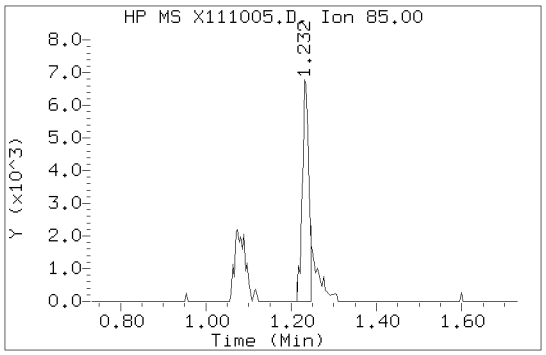
MASS
87
AREA
2305
HEIGHT
1656
17-Nov-2022
13:58
linh
pham



Reason Code:

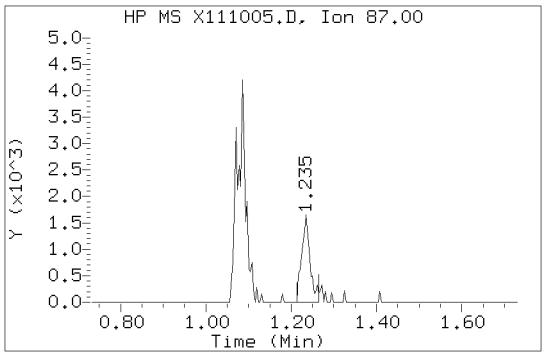
AFTER

MASS
85
AREA
7397
HEIGHT
6784
17-Nov-2022
14:02
linh
pham



AFTER

MASS
87
AREA
2305
HEIGHT
1656
17-Nov-2022
14:02
linh
pham



Chloromethane (74-87-3)

BEFORE

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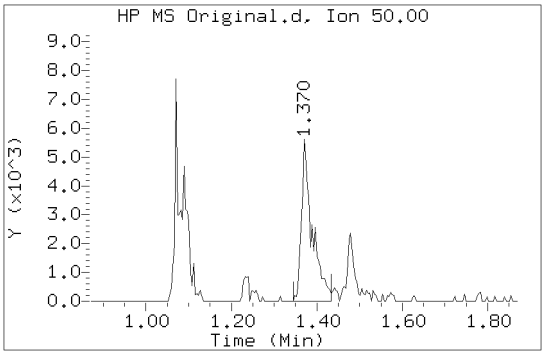
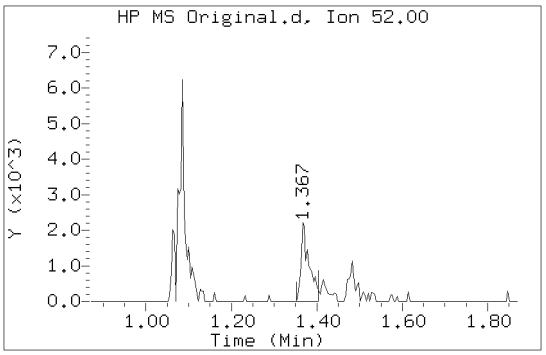
AREA
9973
HEIGHT
5617
17-Nov-2022
13:58
linh
pham



BEFORE

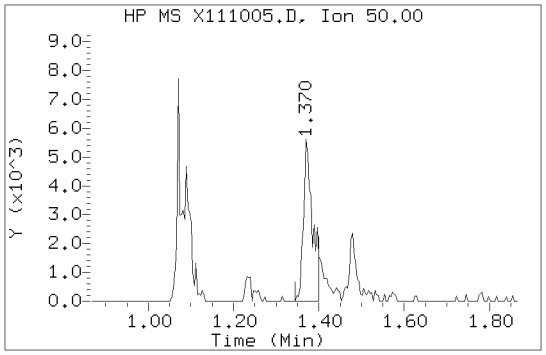
MASS
52
AREA
3014
HEIGHT
2211
17-Nov-2022
13:58
linh
pham



Reason Code:

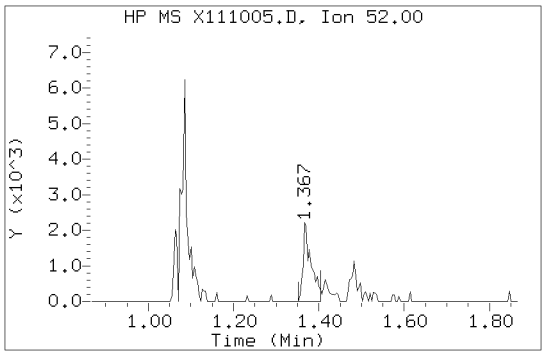
AFTER

MASS
50
AREA
8479
HEIGHT
5617
17-Nov-2022
14:02
linh
pham



AFTER

MASS
52
AREA
3014
HEIGHT
2211
17-Nov-2022
14:02
linh
pham



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Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Vinyl Chloride (75-01-4)

BEFORE

MASS
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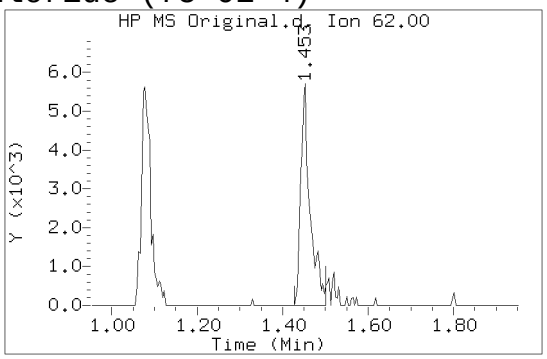
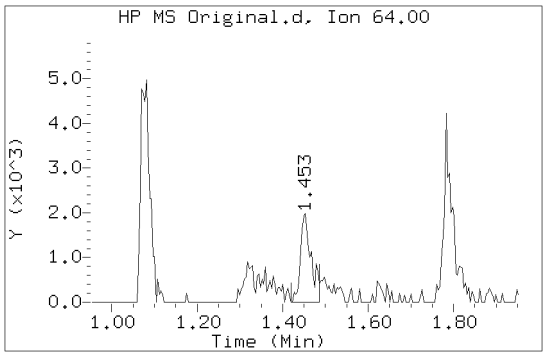
AREA
8941
HEIGHT
5708
17-Nov-2022
13:58
linh
pham



BEFORE

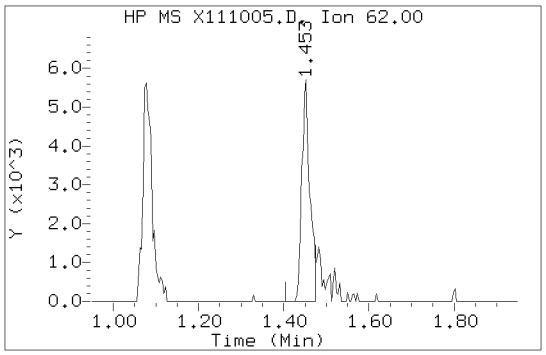
MASS
64
AREA
3539
HEIGHT
1981
17-Nov-2022
13:58
linh
pham



Reason Code:

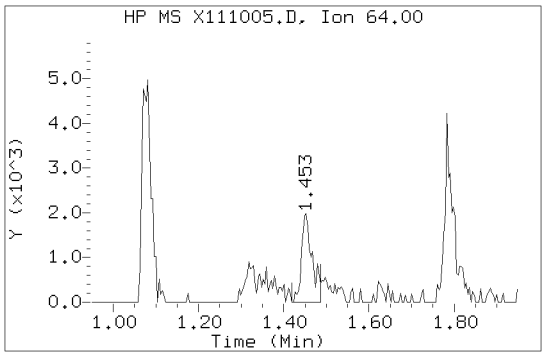
AFTER

MASS
62
AREA
7728
HEIGHT
5708
17-Nov-2022
14:02
linh
pham



AFTER

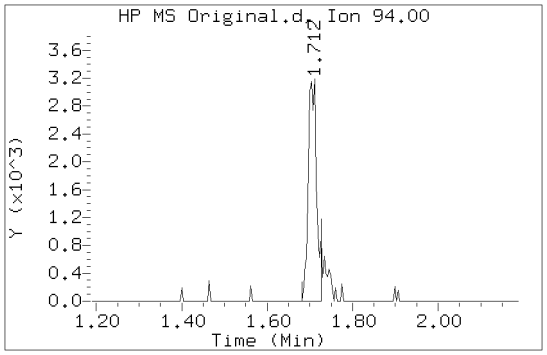
MASS
64
AREA
3539
HEIGHT
1981
17-Nov-2022
14:02
linh
pham



Bromomethane (74-83-9)

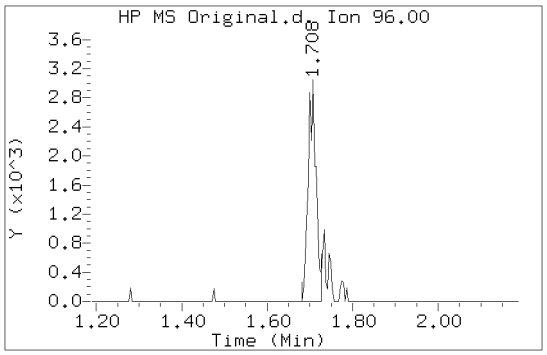
BEFORE

MASS
94
AREA
4409
HEIGHT
3190
17-Nov-2022
13:58
linh
pham



BEFORE

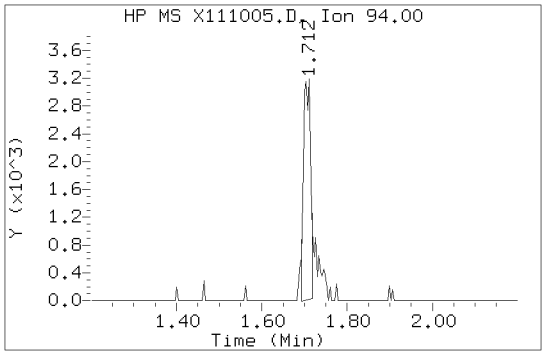
MASS
96
AREA
3885
HEIGHT
3049
17-Nov-2022
13:58
linh
pham



Reason Code:

AFTER

MASS
94
AREA
3868
HEIGHT
3167
17-Nov-2022
14:02
linh
pham



AFTER

MASS
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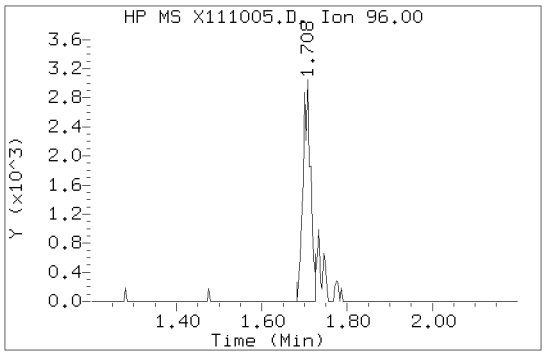
AREA
3885
HEIGHT
3049
17-Nov-2022
14:02
linh
pham



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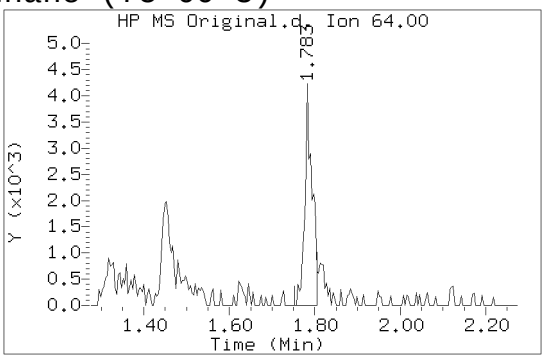
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Chloroethane (75-00-3)

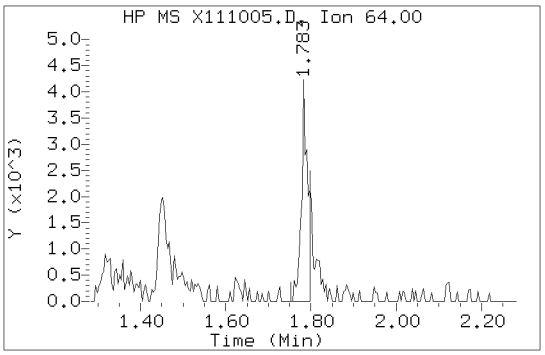
BEFORE

MASS
64
AREA
4973
HEIGHT
4232
17-Nov-2022
13:58
linh
pham



AFTER

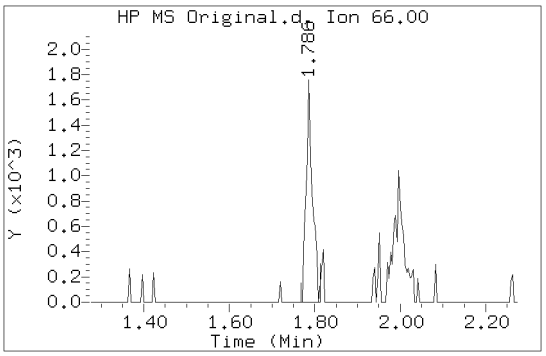
MASS
64
AREA
4394
HEIGHT
4232
17-Nov-2022
14:02
linh
pham



Reason Code:

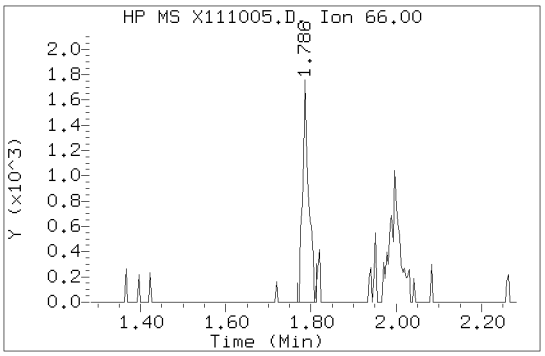
BEFORE

MASS
66
AREA
1807
HEIGHT
1758
17-Nov-2022
13:58
linh
pham



AFTER

MASS
66
AREA
1807
HEIGHT
1758
17-Nov-2022
14:02
linh
pham

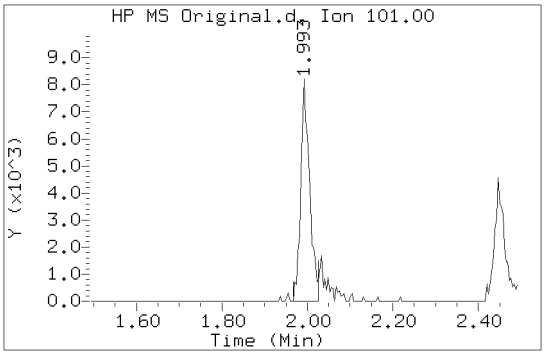


Reason Code:

Trichlorofluoromethane (75-69-4)

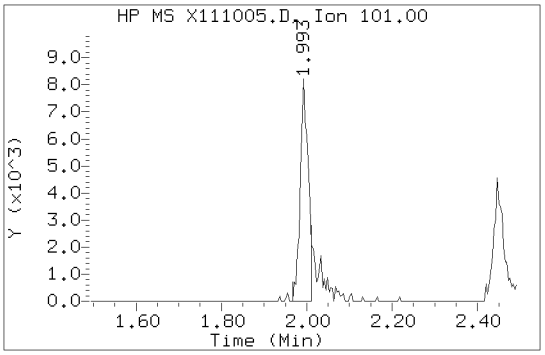
BEFORE

MASS
101
AREA
12194
HEIGHT
8219
17-Nov-2022
13:58
linh
pham



AFTER

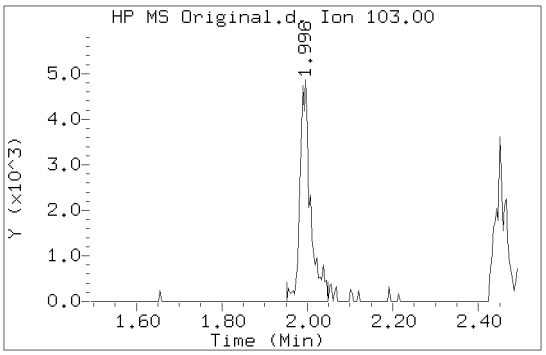
MASS
101
AREA
11059
HEIGHT
8219
17-Nov-2022
14:02
linh
pham



Reason Code:

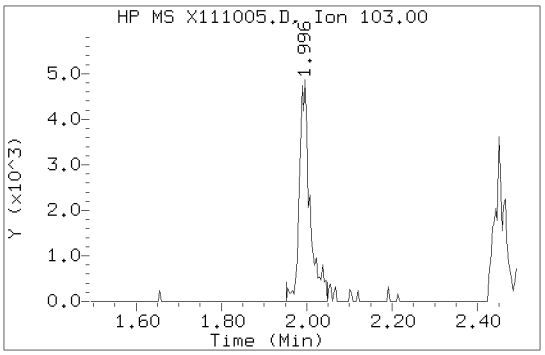
BEFORE

MASS
103
AREA
8482
HEIGHT
4869
17-Nov-2022
13:58
linh
pham



AFTER

MASS
103
AREA
8482
HEIGHT
4869
17-Nov-2022
14:02
linh
pham



Reason Code:

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Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,1-Dichloroethene (75-35-4)

Reason Code:

BEFORE

MASS
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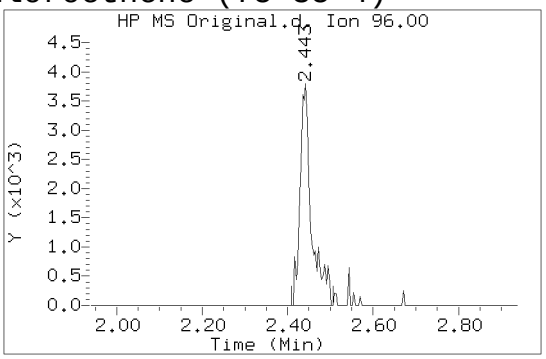
AREA
7177
HEIGHT
3797
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
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HEIGHT
3797
17-Nov-2022
14:02
linh
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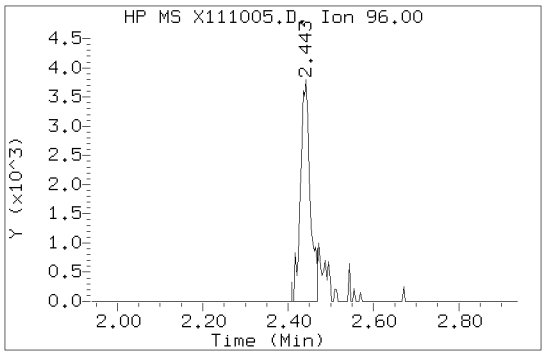

BEFORE

MASS
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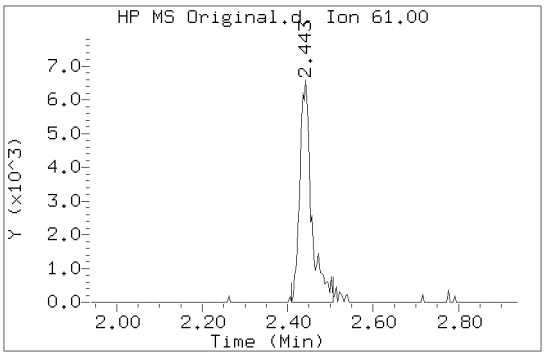
AREA
12852
HEIGHT
6595
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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12852
HEIGHT
6595
17-Nov-2022
14:02
linh
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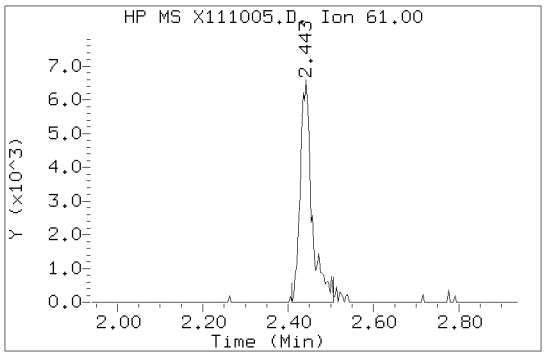

BEFORE

MASS
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AREA
4162
HEIGHT
2466
17-Nov-2022
13:58
linh
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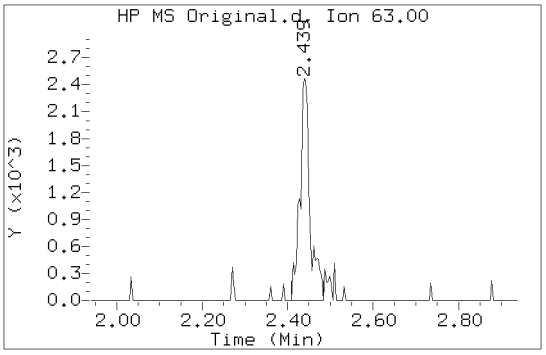

AFTER

MASS
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17-Nov-2022
14:02
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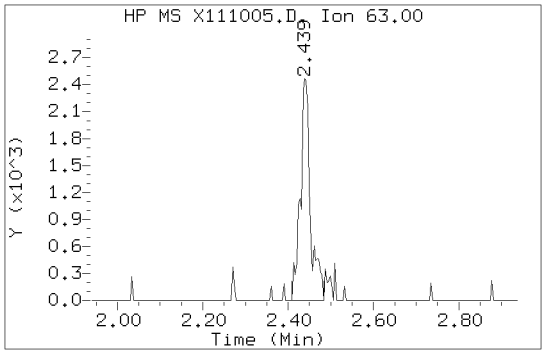
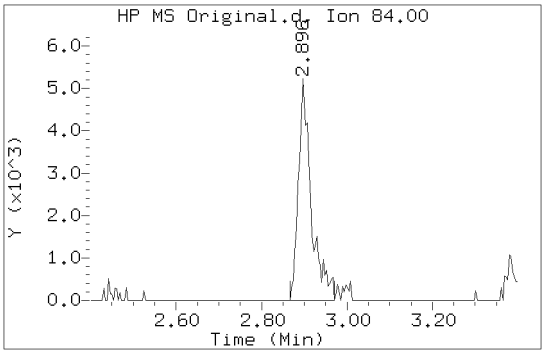


Methylene Chloride (75-09-2)

Reason Code:

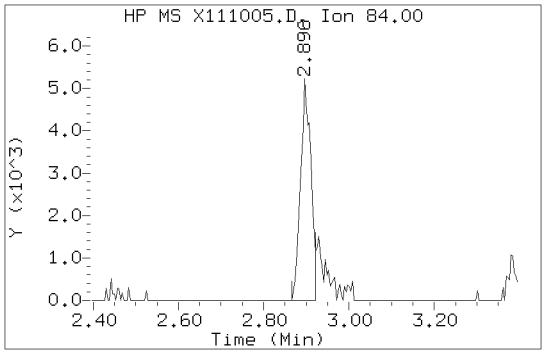
BEFORE

MASS
84
AREA
11107
HEIGHT
5229
17-Nov-2022
13:58
linh
pham



AFTER

MASS
84
AREA
9066
HEIGHT
5229
17-Nov-2022
14:02
linh
pham

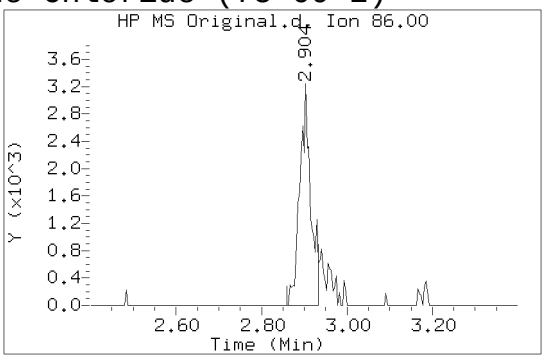


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

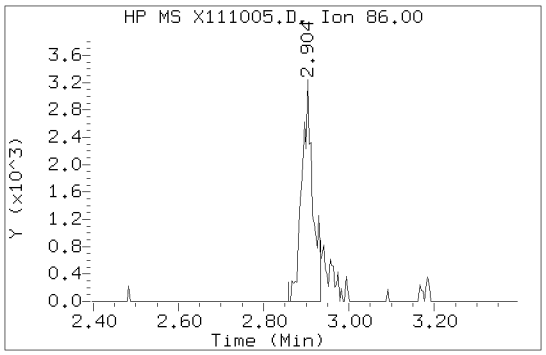
Methylene Chloride (75-09-2)

Reason Code:

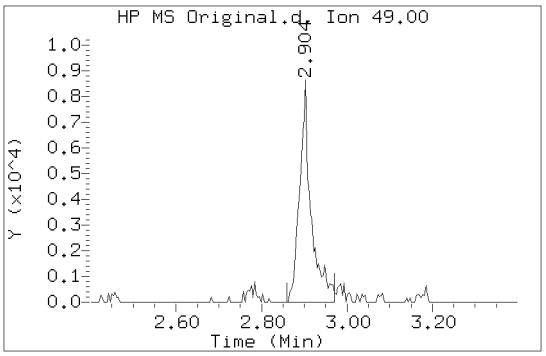
BEFORE
MASS
86
AREA
5877
HEIGHT
3243
17-Nov-2022
13:58
linh
pham



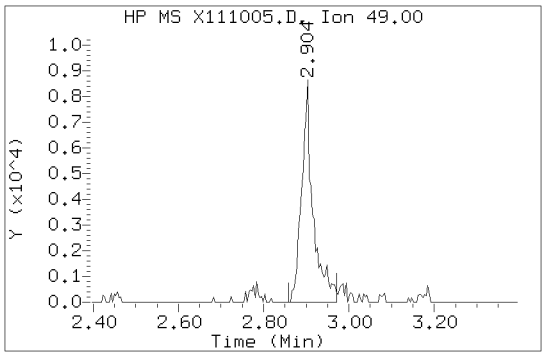
AFTER
MASS
86
AREA
5877
HEIGHT
3243
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
49
AREA
16339
HEIGHT
8646
17-Nov-2022
13:58
linh
pham



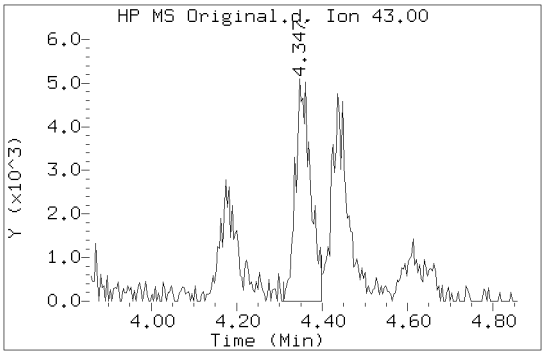
AFTER
MASS
49
AREA
16339
HEIGHT
8646
17-Nov-2022
14:02
linh
pham



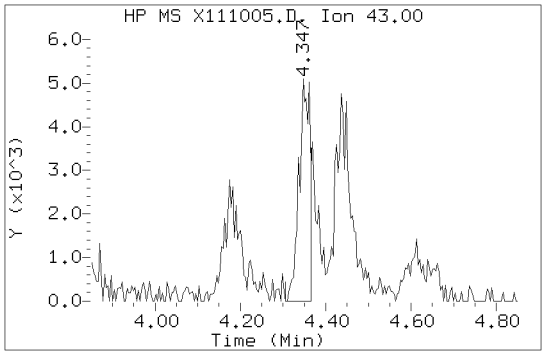
2-Butanone (78-93-3)

Reason Code:

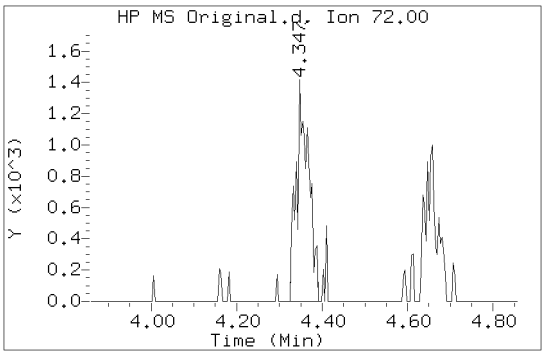
BEFORE
MASS
43
AREA
12686
HEIGHT
5097
17-Nov-2022
13:58
linh
pham



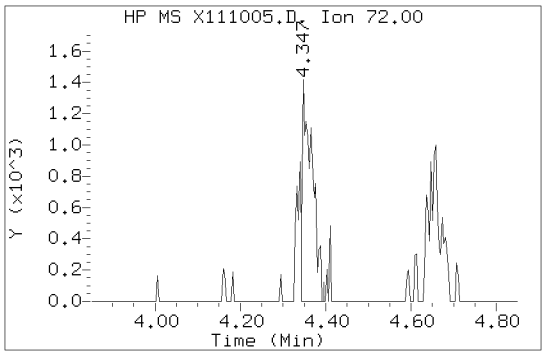
AFTER
MASS
43
AREA
9107
HEIGHT
5097
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
72
AREA
2899
HEIGHT
1417
17-Nov-2022
13:58
linh
pham



AFTER
MASS
72
AREA
2312
HEIGHT
1417
17-Nov-2022
14:02
linh
pham



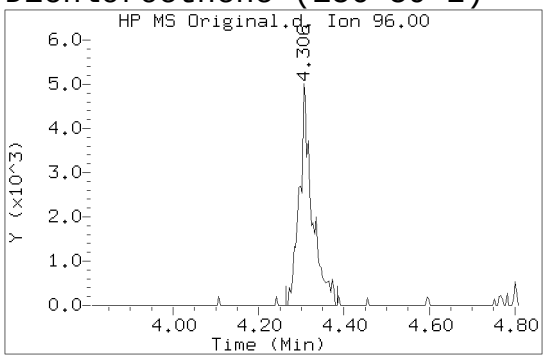
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

cis-1,2-Dichloroethene (156-59-2)

Reason Code:

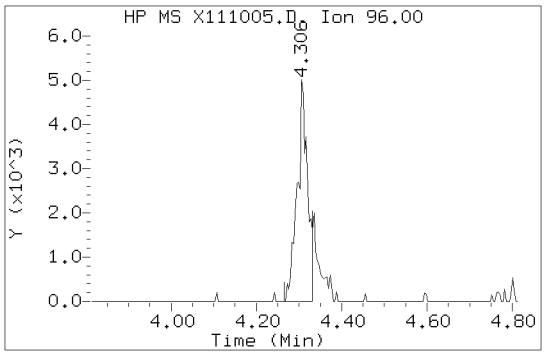
BEFORE

MASS
96
AREA
10628
HEIGHT
5012
17-Nov-2022
13:58
linh
pham



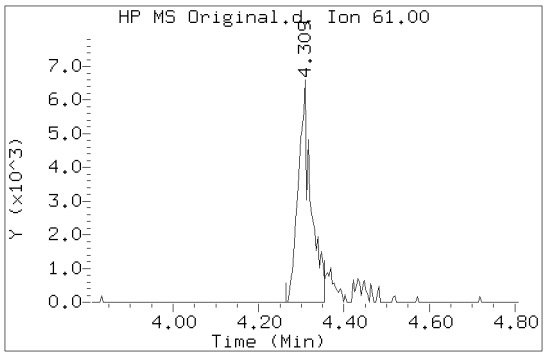
AFTER

MASS
96
AREA
8625
HEIGHT
5012
17-Nov-2022
14:02
linh
pham



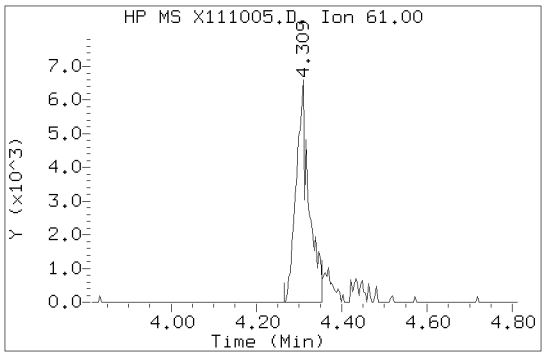
BEFORE

MASS
61
AREA
13778
HEIGHT
6597
17-Nov-2022
13:58
linh
pham



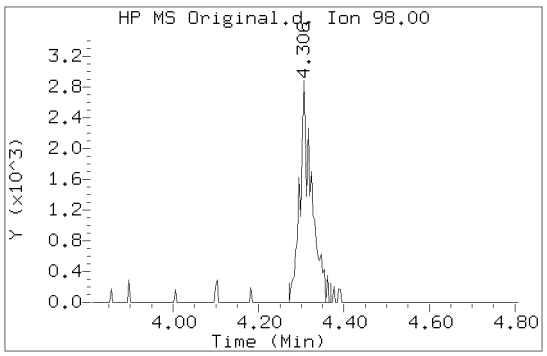
AFTER

MASS
61
AREA
13778
HEIGHT
6597
17-Nov-2022
14:02
linh
pham



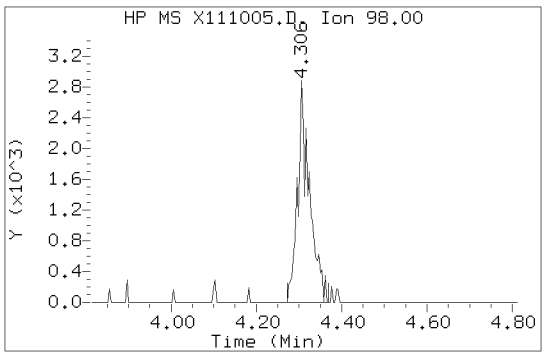
BEFORE

MASS
98
AREA
5581
HEIGHT
2879
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
5581
HEIGHT
2879
17-Nov-2022
14:02
linh
pham

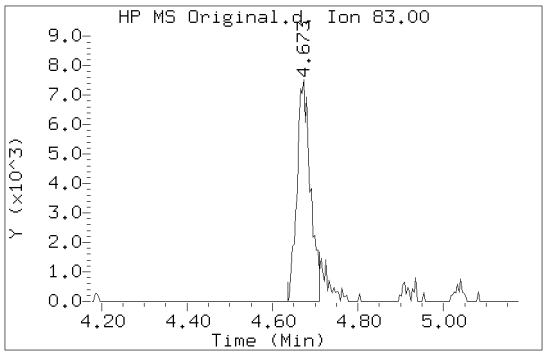


Chloroform (67-66-3)

Reason Code:

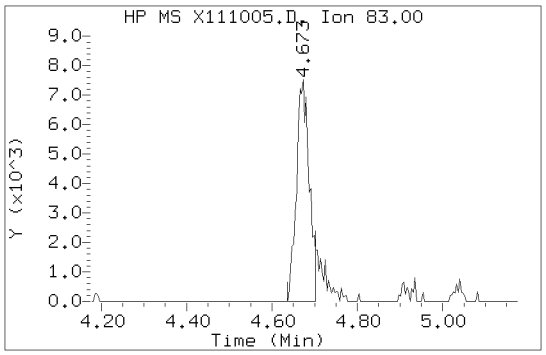
BEFORE

MASS
83
AREA
16630
HEIGHT
7524
17-Nov-2022
13:58
linh
pham



AFTER

MASS
83
AREA
16011
HEIGHT
7524
17-Nov-2022
14:02
linh
pham

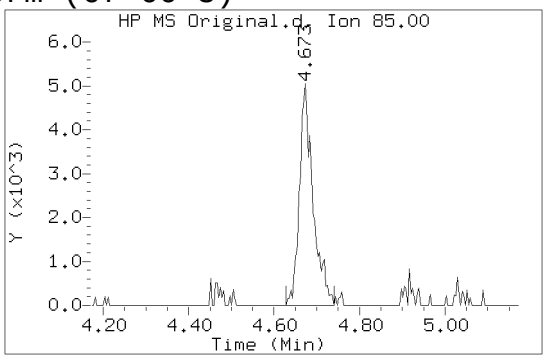


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

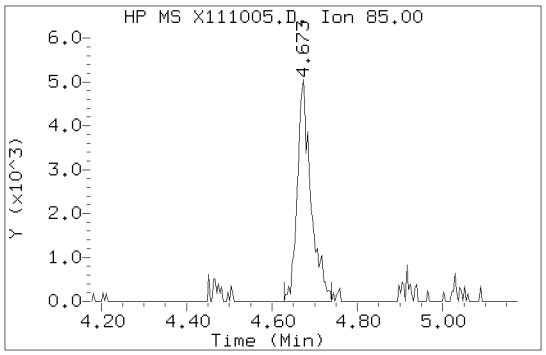
Chloroform (67-66-3)

Reason Code:

BEFORE
MASS
85
AREA
11368
HEIGHT
5051
17-Nov-2022
13:58
linh
pham



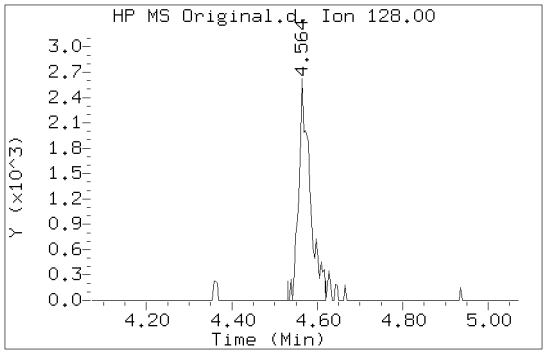
AFTER
MASS
85
AREA
11368
HEIGHT
5051
17-Nov-2022
14:02
linh
pham



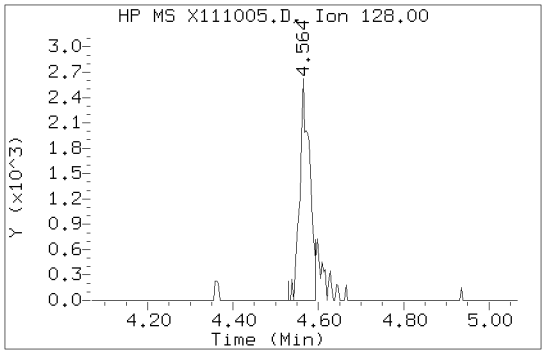
Bromochloromethane (74-97-5)

Reason Code:

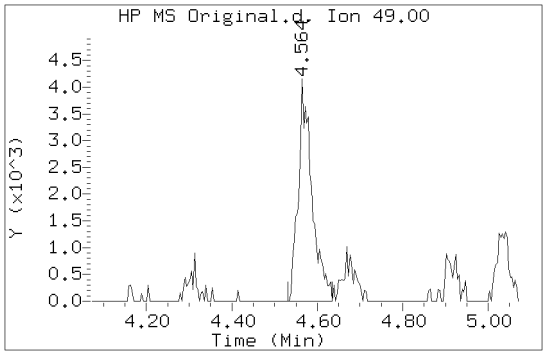
BEFORE
MASS
128
AREA
4941
HEIGHT
2623
17-Nov-2022
13:58
linh
pham



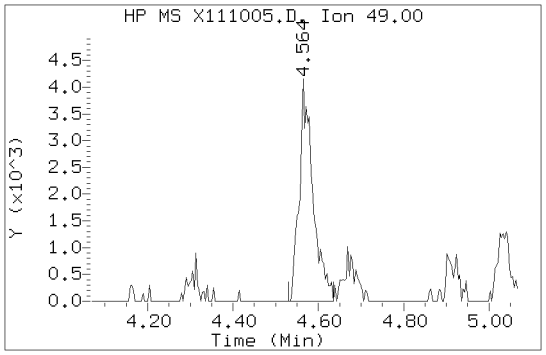
AFTER
MASS
128
AREA
4346
HEIGHT
2623
17-Nov-2022
14:02
linh
pham



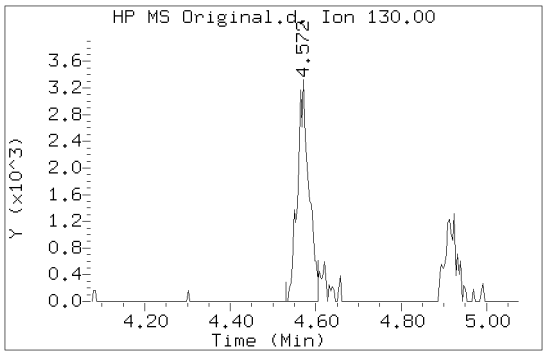
BEFORE
MASS
49
AREA
9362
HEIGHT
4153
17-Nov-2022
13:58
linh
pham



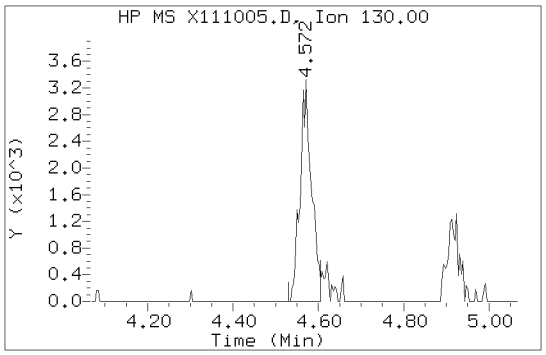
AFTER
MASS
49
AREA
9362
HEIGHT
4153
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
130
AREA
6336
HEIGHT
3324
17-Nov-2022
13:58
linh
pham



AFTER
MASS
130
AREA
6336
HEIGHT
3324
17-Nov-2022
14:02
linh
pham



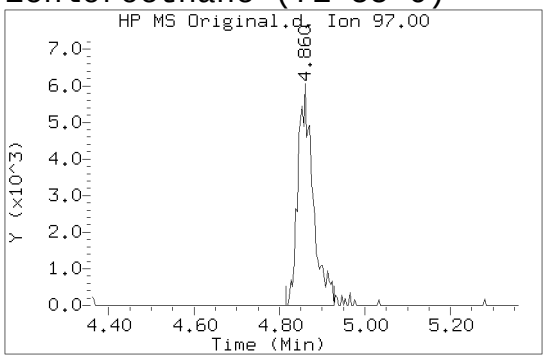
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,1,1-Trichloroethane (71-55-6)

Reason Code:

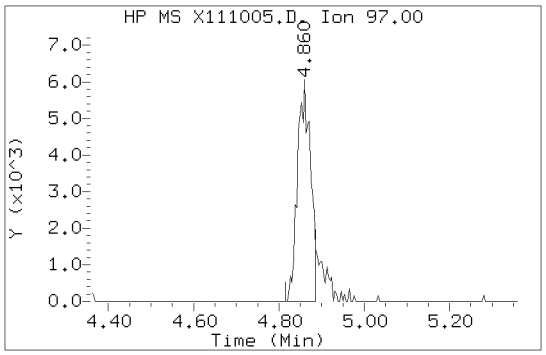
BEFORE

MASS
97
AREA
15076
HEIGHT
6059
17-Nov-2022
13:58
linh
pham



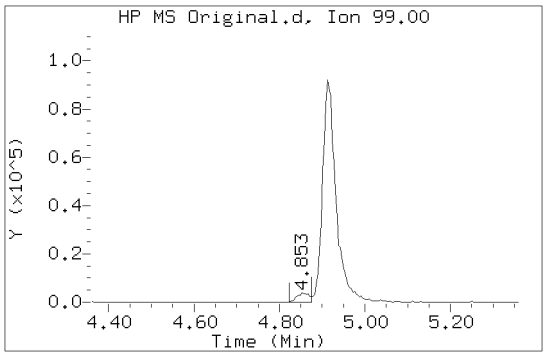
AFTER

MASS
97
AREA
13178
HEIGHT
6059
17-Nov-2022
14:02
linh
pham



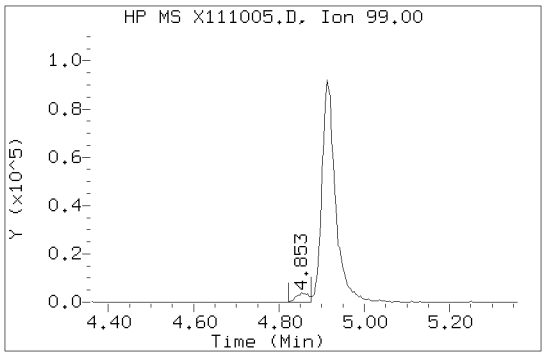
BEFORE

MASS
99
AREA
7767
HEIGHT
3981
17-Nov-2022
13:58
linh
pham



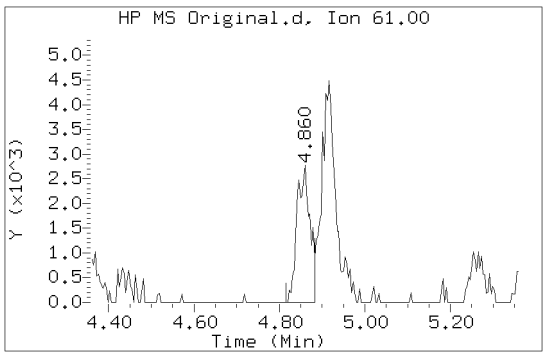
AFTER

MASS
99
AREA
7767
HEIGHT
3981
17-Nov-2022
14:02
linh
pham



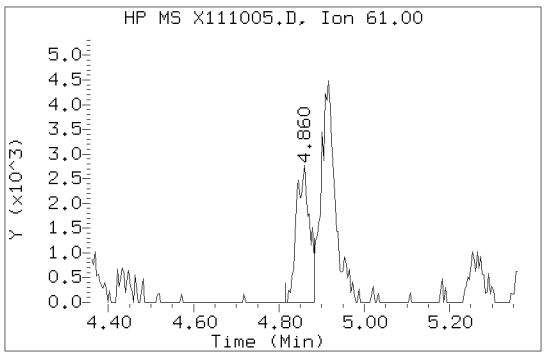
BEFORE

MASS
61
AREA
5988
HEIGHT
2776
17-Nov-2022
13:58
linh
pham



AFTER

MASS
61
AREA
5988
HEIGHT
2776
17-Nov-2022
14:02
linh
pham

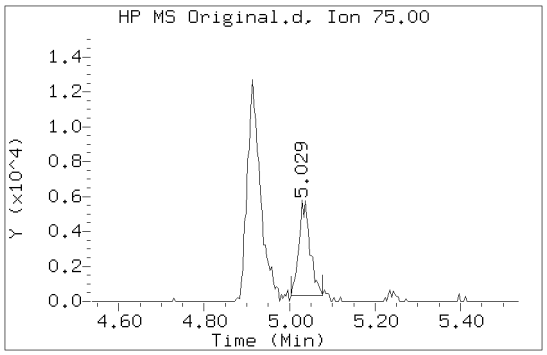


1,1-Dichloropropene (563-58-6)

Reason Code:

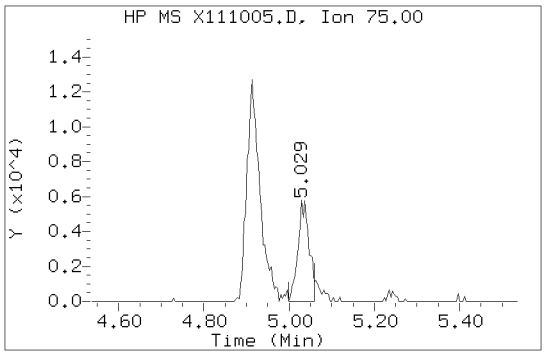
BEFORE

MASS
75
AREA
10182
HEIGHT
5498
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
10760
HEIGHT
5812
17-Nov-2022
14:02
linh
pham



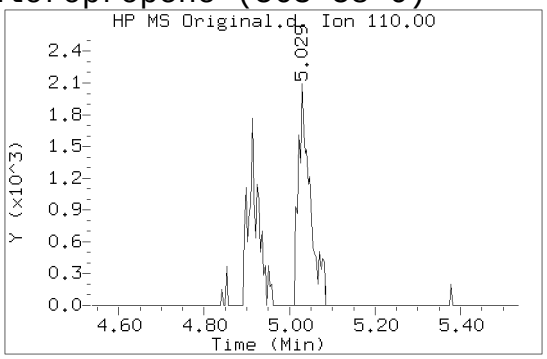
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,1-Dichloropropene (563-58-6)

Reason Code:

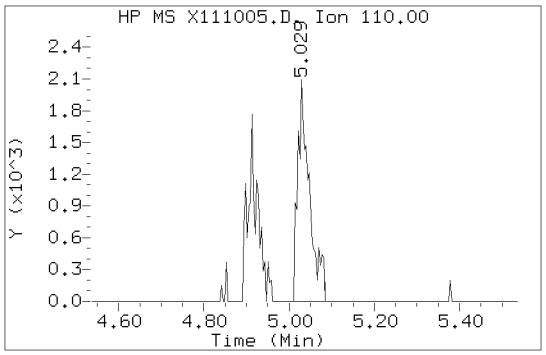
BEFORE

MASS
110
AREA
4030
HEIGHT
2093
17-Nov-2022
13:58
linh
pham



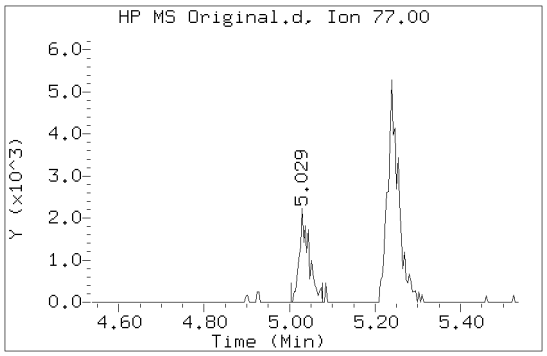
AFTER

MASS
110
AREA
4030
HEIGHT
2093
17-Nov-2022
14:02
linh
pham



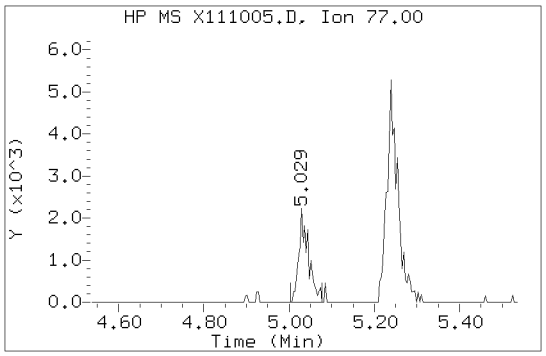
BEFORE

MASS
77
AREA
3529
HEIGHT
2231
17-Nov-2022
13:58
linh
pham



AFTER

MASS
77
AREA
3529
HEIGHT
2231
17-Nov-2022
14:02
linh
pham

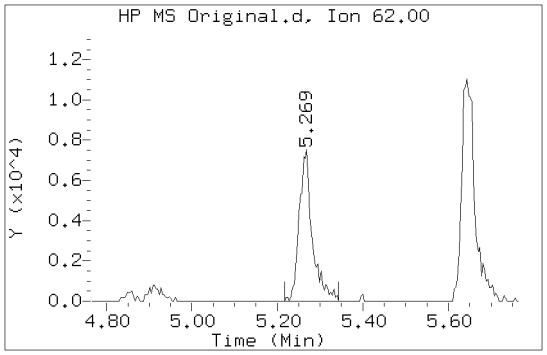


1,2-Dichloroethane (107-06-2)

Reason Code:

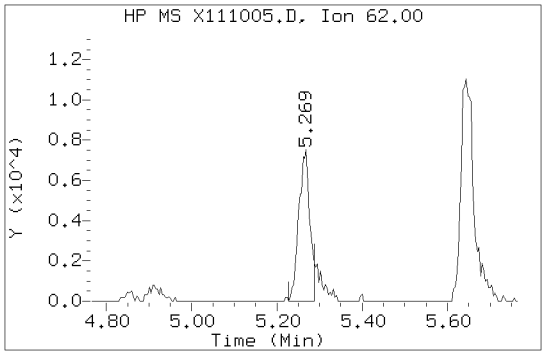
BEFORE

MASS
62
AREA
16340
HEIGHT
7524
17-Nov-2022
13:58
linh
pham



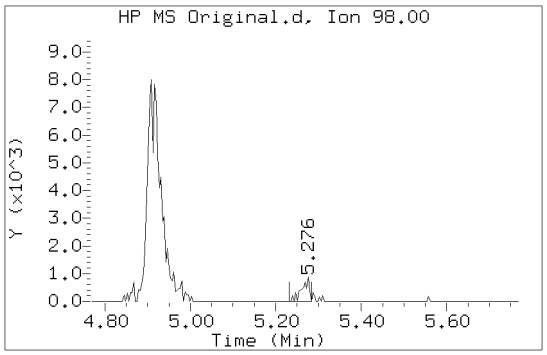
AFTER

MASS
62
AREA
13774
HEIGHT
7524
17-Nov-2022
14:02
linh
pham



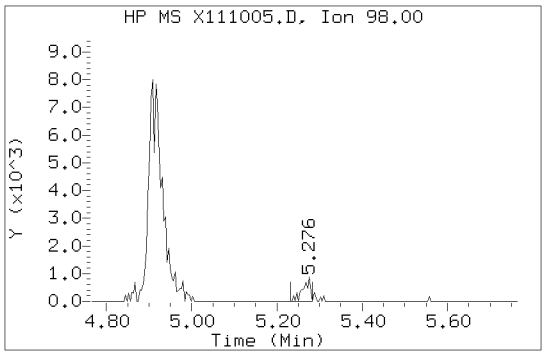
BEFORE

MASS
98
AREA
1049
HEIGHT
875
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
1049
HEIGHT
875
17-Nov-2022
14:02
linh
pham



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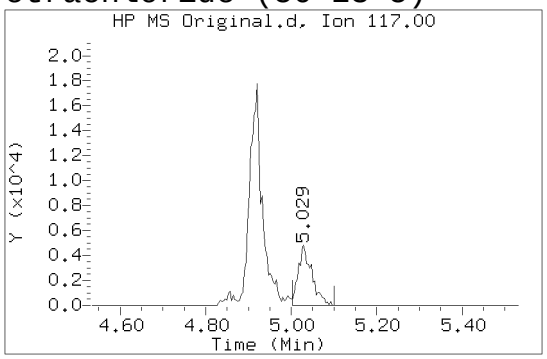
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

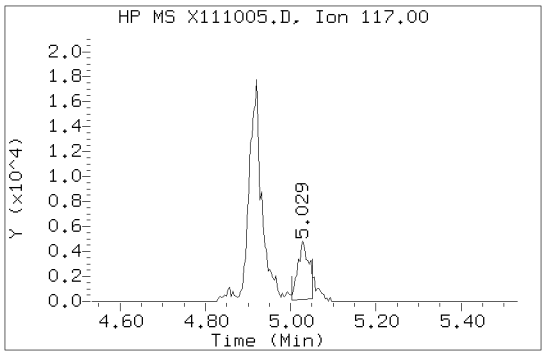
Carbon Tetrachloride (56-23-5)

Reason Code:

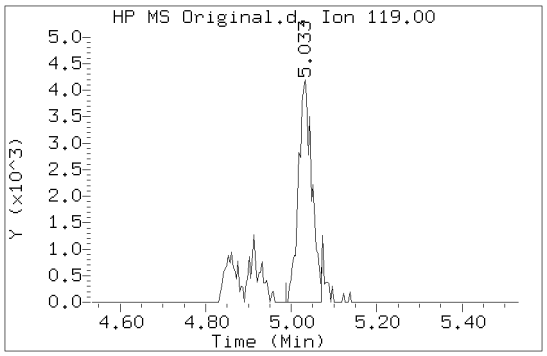
BEFORE
MASS
117
AREA
10780
HEIGHT
4851
17-Nov-2022
13:58
linh
pham



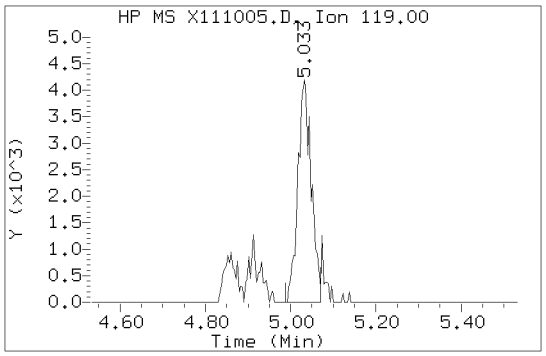
AFTER
MASS
117
AREA
8603
HEIGHT
4695
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
119
AREA
9279
HEIGHT
4194
17-Nov-2022
13:58
linh
pham



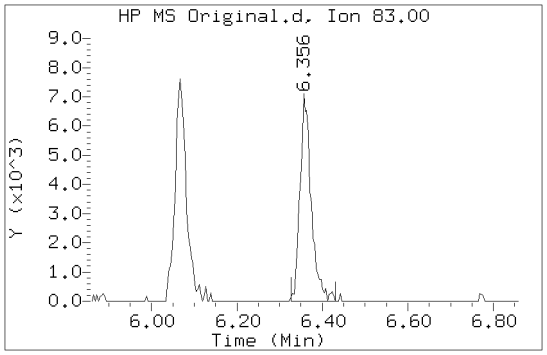
AFTER
MASS
119
AREA
9279
HEIGHT
4194
17-Nov-2022
14:02
linh
pham



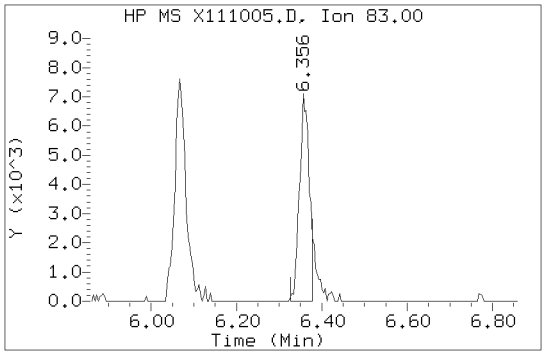
Bromodichloromethane (75-27-4)

Reason Code:

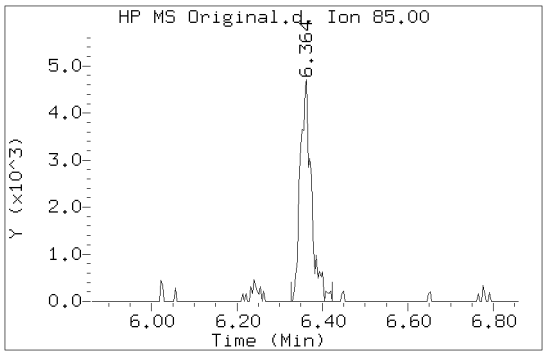
BEFORE
MASS
83
AREA
13262
HEIGHT
7116
17-Nov-2022
13:58
linh
pham



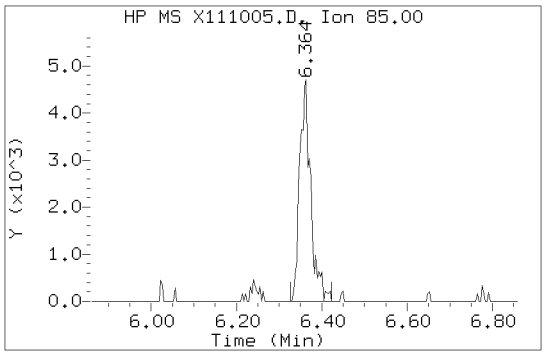
AFTER
MASS
83
AREA
11558
HEIGHT
7116
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
85
AREA
8653
HEIGHT
4709
17-Nov-2022
13:58
linh
pham



AFTER
MASS
85
AREA
8653
HEIGHT
4709
17-Nov-2022
14:02
linh
pham

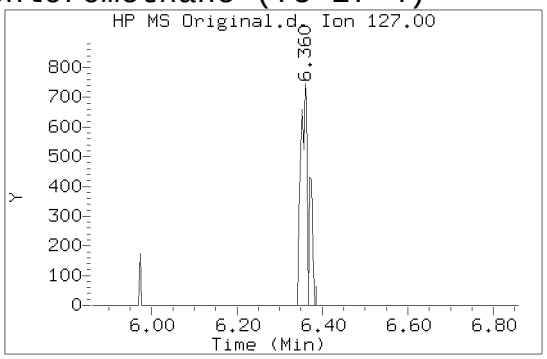


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Bromodichloromethane (75-27-4)

BEFORE

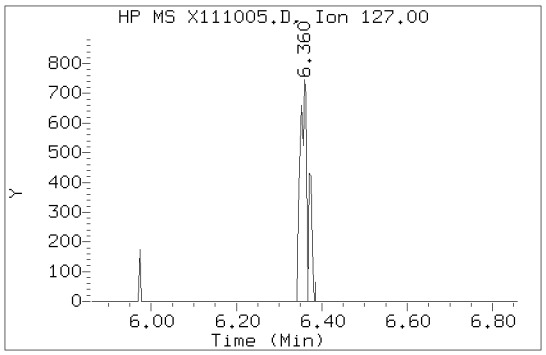
MASS
127
AREA
1008
HEIGHT
746
17-Nov-2022
13:58
linh
pham



Reason Code:

AFTER

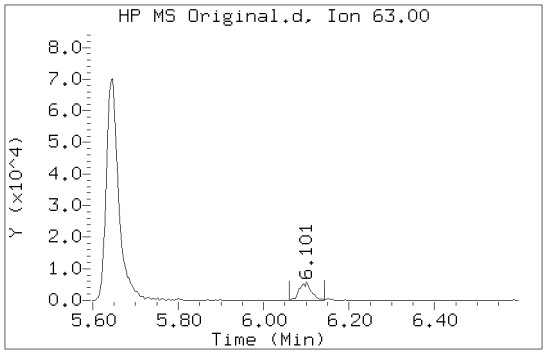
MASS
127
AREA
1008
HEIGHT
746
17-Nov-2022
14:02
linh
pham



1,2-Dichloropropane (78-87-5)

BEFORE

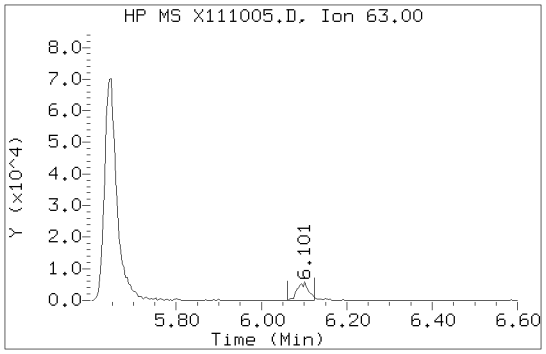
MASS
63
AREA
11163
HEIGHT
5856
17-Nov-2022
13:58
linh
pham



Reason Code:

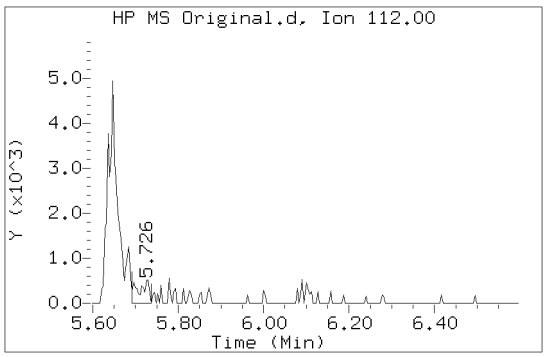
AFTER

MASS
63
AREA
10678
HEIGHT
5856
17-Nov-2022
14:02
linh
pham



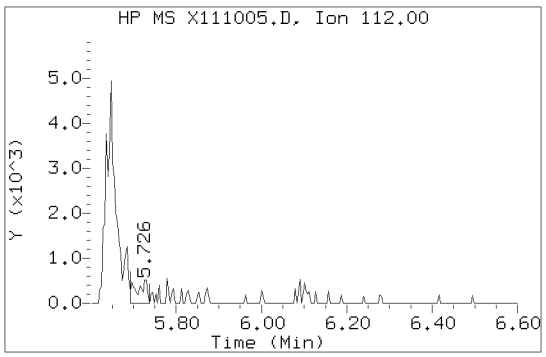
BEFORE

MASS
112
AREA
910
HEIGHT
519
17-Nov-2022
13:58
linh
pham



AFTER

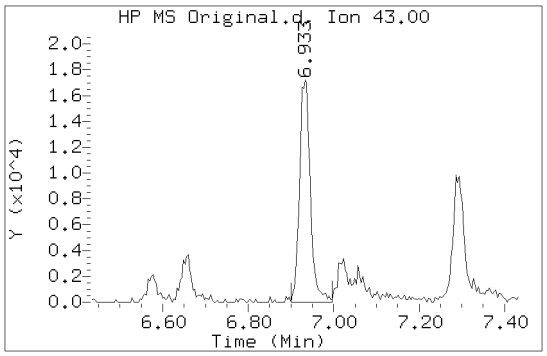
MASS
112
AREA
910
HEIGHT
519
17-Nov-2022
14:02
linh
pham



4-Methyl-2-Pentanone (108-10-1)

BEFORE

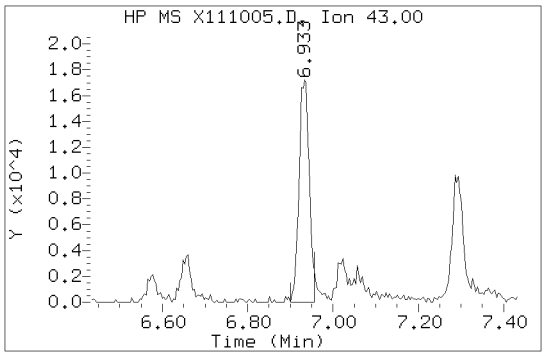
MASS
43
AREA
31022
HEIGHT
17216
17-Nov-2022
13:58
linh
pham



Reason Code:

AFTER

MASS
43
AREA
29360
HEIGHT
17216
17-Nov-2022
14:02
linh
pham



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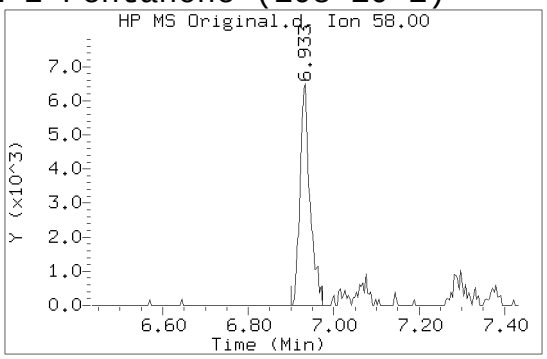
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

4-Methyl-2-Pentanone (108-10-1)

Reason Code:

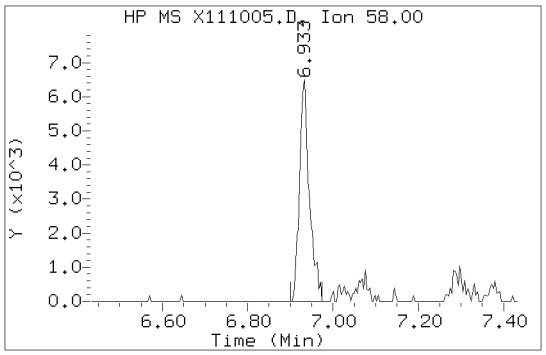
BEFORE

MASS
58
AREA
10777
HEIGHT
6499
17-Nov-2022
13:58
linh
pham



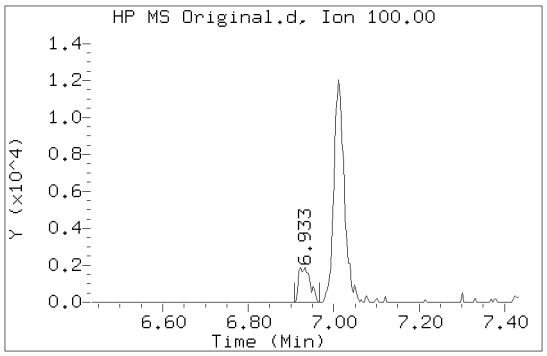
AFTER

MASS
58
AREA
10777
HEIGHT
6499
17-Nov-2022
14:02
linh
pham



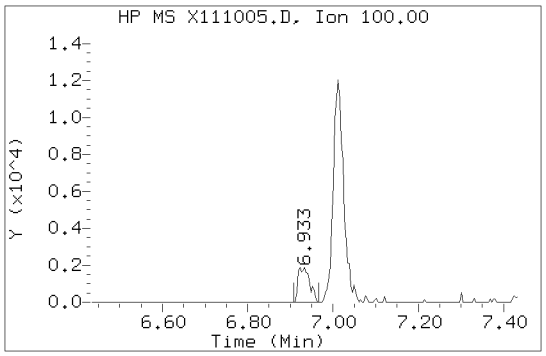
BEFORE

MASS
100
AREA
3612
HEIGHT
1878
17-Nov-2022
13:58
linh
pham



AFTER

MASS
100
AREA
3612
HEIGHT
1878
17-Nov-2022
14:02
linh
pham

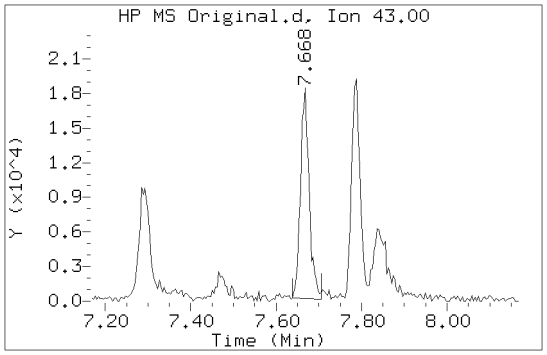


2-Hexanone (591-78-6)

Reason Code:

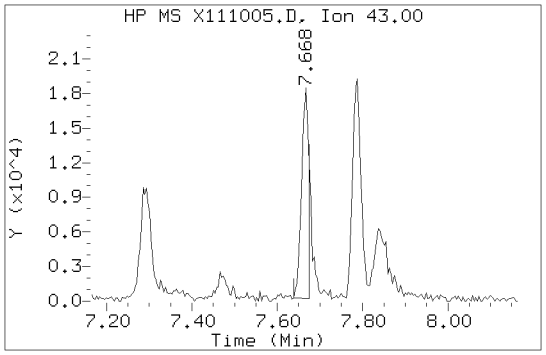
BEFORE

MASS
43
AREA
26549
HEIGHT
18239
17-Nov-2022
13:58
linh
pham



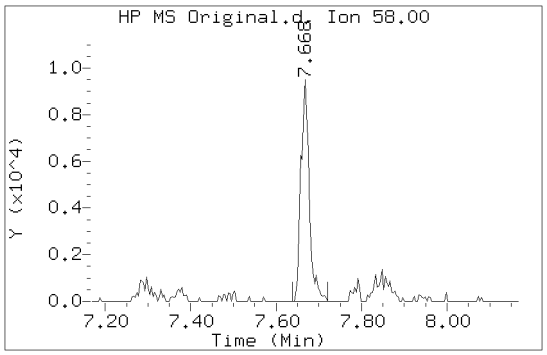
AFTER

MASS
43
AREA
21835
HEIGHT
18238
17-Nov-2022
14:02
linh
pham



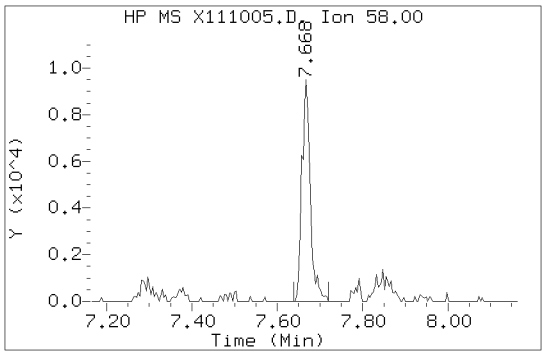
BEFORE

MASS
58
AREA
13402
HEIGHT
9500
17-Nov-2022
13:58
linh
pham



AFTER

MASS
58
AREA
13402
HEIGHT
9500
17-Nov-2022
14:02
linh
pham



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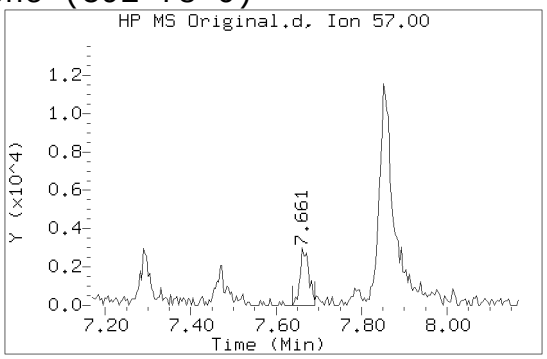
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

2-Hexanone (591-78-6)

Reason Code:

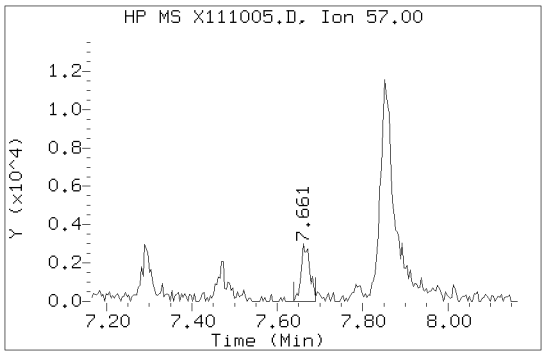
BEFORE

MASS
57
AREA
4376
HEIGHT
3004
17-Nov-2022
13:58
linh
pham



AFTER

MASS
57
AREA
4376
HEIGHT
3004
17-Nov-2022
14:02
linh
pham

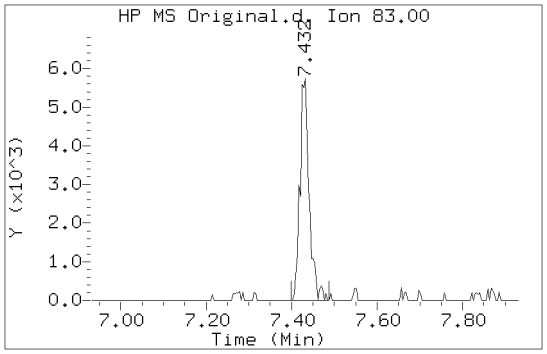


1,1,2-Trichloroethane (79-00-5)

Reason Code:

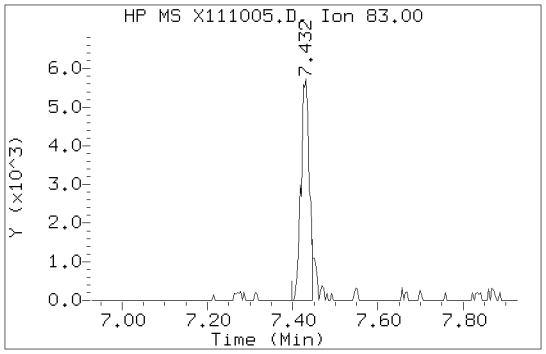
BEFORE

MASS
83
AREA
8877
HEIGHT
5738
17-Nov-2022
13:58
linh
pham



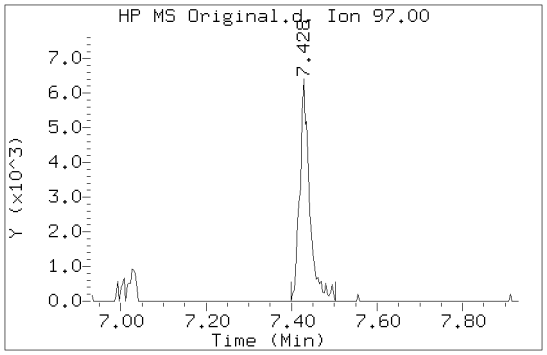
AFTER

MASS
83
AREA
8032
HEIGHT
5738
17-Nov-2022
14:02
linh
pham



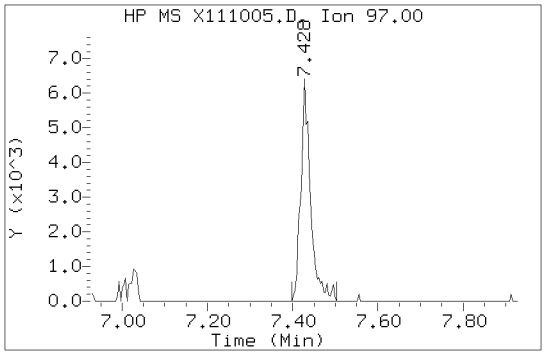
BEFORE

MASS
97
AREA
10565
HEIGHT
6410
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
10565
HEIGHT
6410
17-Nov-2022
14:02
linh
pham

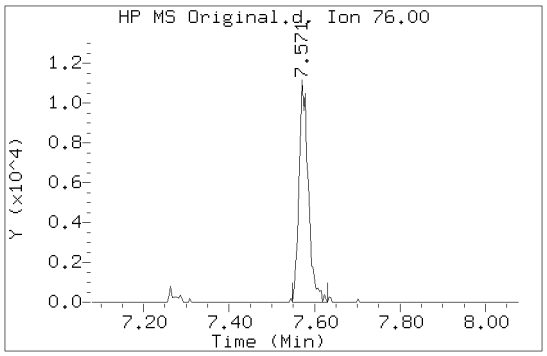


1,3-Dichloropropane (142-28-9)

Reason Code:

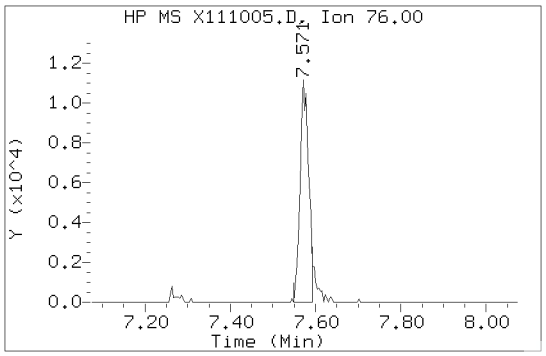
BEFORE

MASS
76
AREA
17343
HEIGHT
11167
17-Nov-2022
13:58
linh
pham



AFTER

MASS
76
AREA
16027
HEIGHT
11167
17-Nov-2022
14:02
linh
pham



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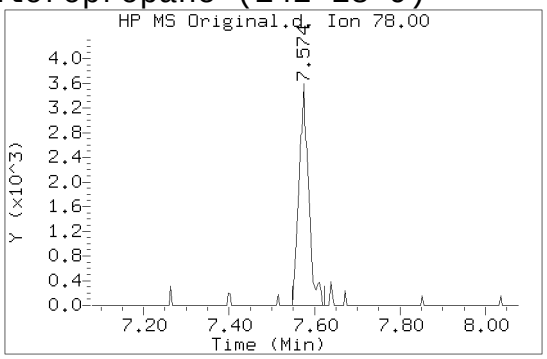
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,3-Dichloropropane (142-28-9)

Reason Code:

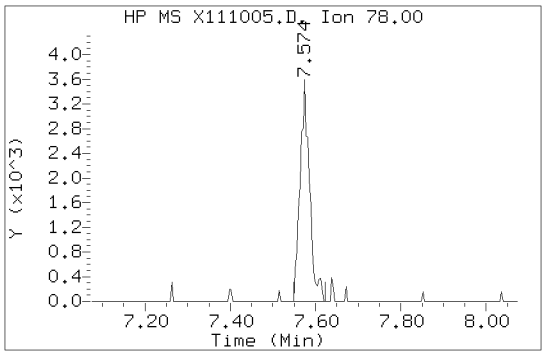
BEFORE

MASS
78
AREA
5718
HEIGHT
3594
17-Nov-2022
13:58
linh
pham



AFTER

MASS
78
AREA
5718
HEIGHT
3594
17-Nov-2022
14:02
linh
pham

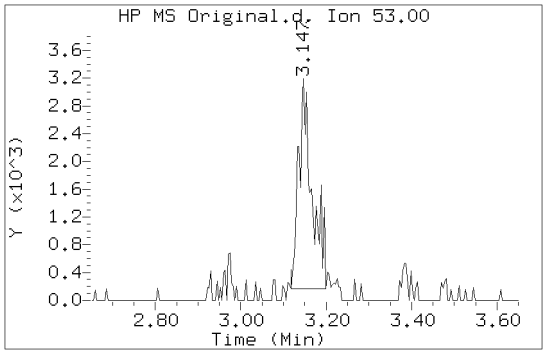


Acrylonitrile (107-13-1)

Reason Code:

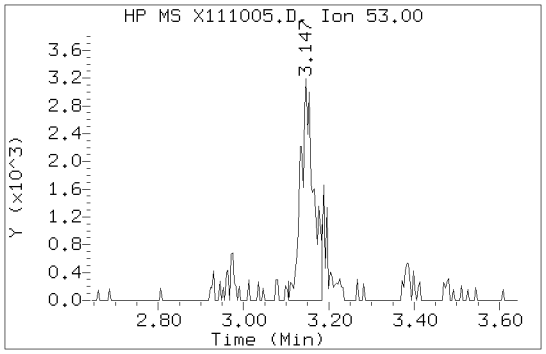
BEFORE

MASS
53
AREA
6615
HEIGHT
3023
17-Nov-2022
13:58
linh
pham



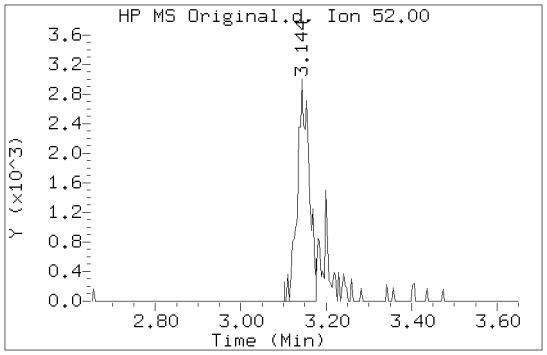
AFTER

MASS
53
AREA
6787
HEIGHT
3192
17-Nov-2022
14:02
linh
pham



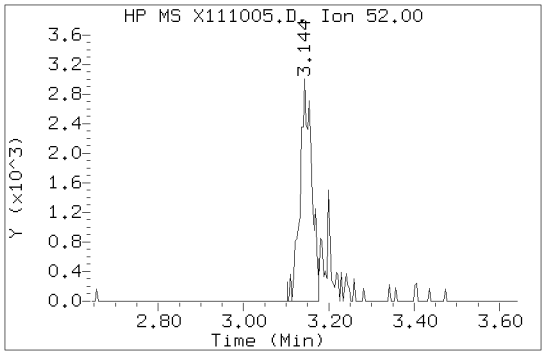
BEFORE

MASS
52
AREA
5849
HEIGHT
3004
17-Nov-2022
13:58
linh
pham



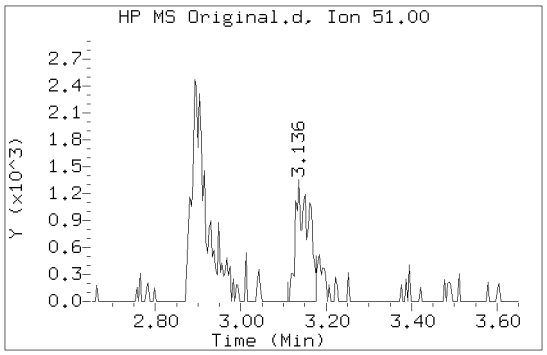
AFTER

MASS
52
AREA
5849
HEIGHT
3004
17-Nov-2022
14:02
linh
pham



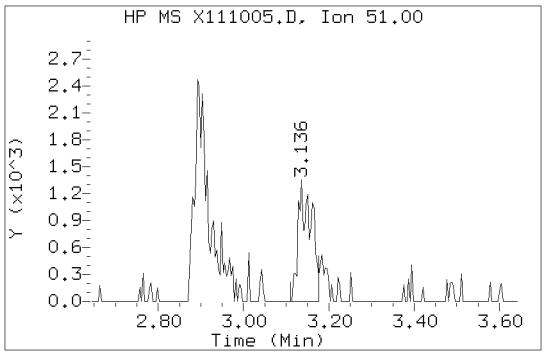
BEFORE

MASS
51
AREA
2955
HEIGHT
1357
17-Nov-2022
13:58
linh
pham



AFTER

MASS
51
AREA
2955
HEIGHT
1357
17-Nov-2022
14:02
linh
pham



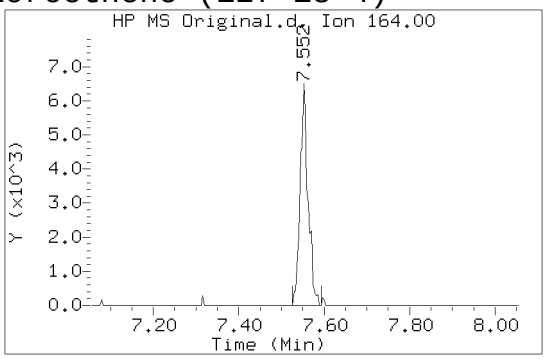
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Tetrachloroethene (127-18-4)

Reason Code:

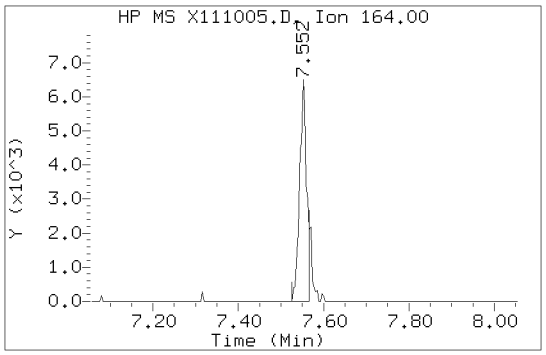
BEFORE

MASS
164
AREA
8534
HEIGHT
6502
17-Nov-2022
13:58
linh
pham



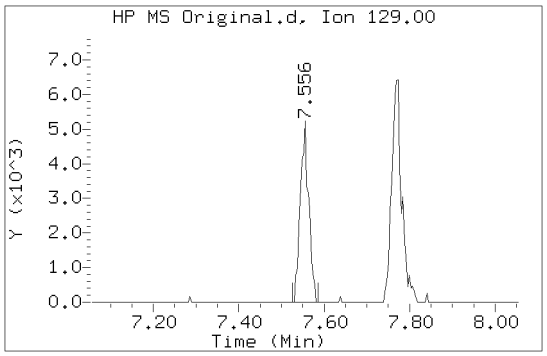
AFTER

MASS
164
AREA
7683
HEIGHT
6502
17-Nov-2022
14:02
linh
pham



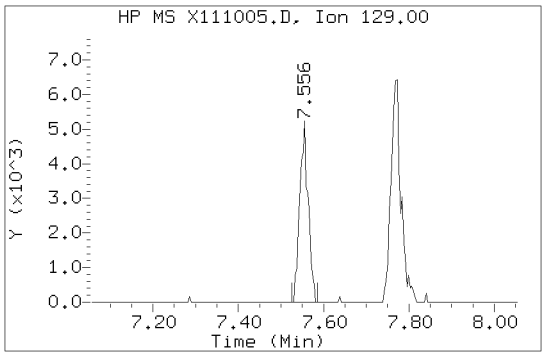
BEFORE

MASS
129
AREA
7343
HEIGHT
5239
17-Nov-2022
13:58
linh
pham



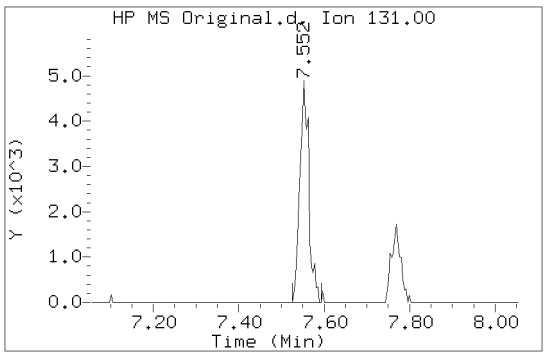
AFTER

MASS
129
AREA
7343
HEIGHT
5239
17-Nov-2022
14:02
linh
pham



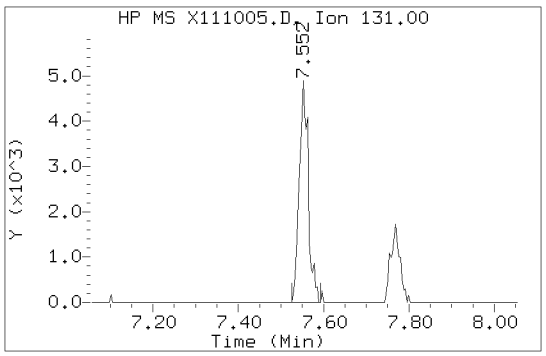
BEFORE

MASS
131
AREA
7373
HEIGHT
4893
17-Nov-2022
13:58
linh
pham



AFTER

MASS
131
AREA
7373
HEIGHT
4893
17-Nov-2022
14:02
linh
pham

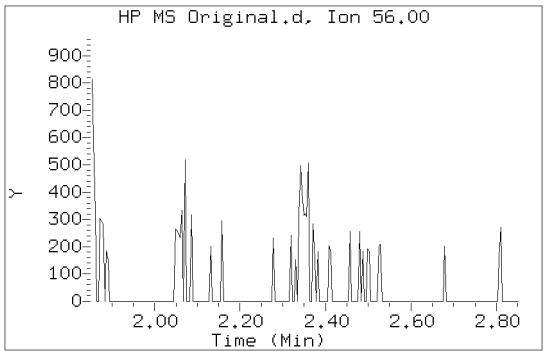


Acrolein (107-02-8)

Reason Code:

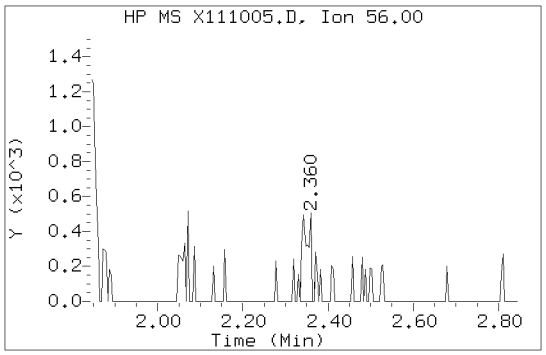
BEFORE

MASS
56
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
56
AREA
599
HEIGHT
506
17-Nov-2022
14:02
linh
pham



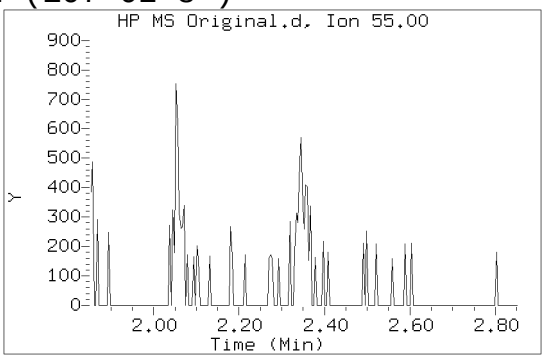
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Acrolein (107-02-8)

Reason Code:

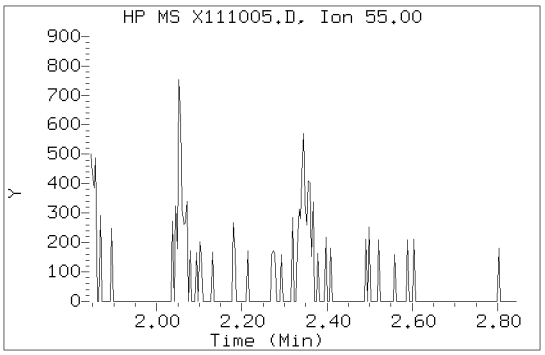
BEFORE

MASS
55
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



AFTER

MASS
55
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham

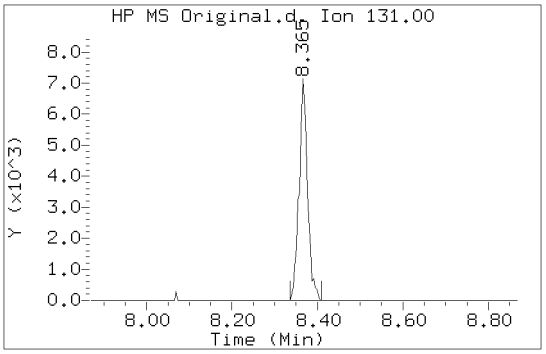


1,1,1,2-Tetrachloroethane (630-20-6)

Reason Code:

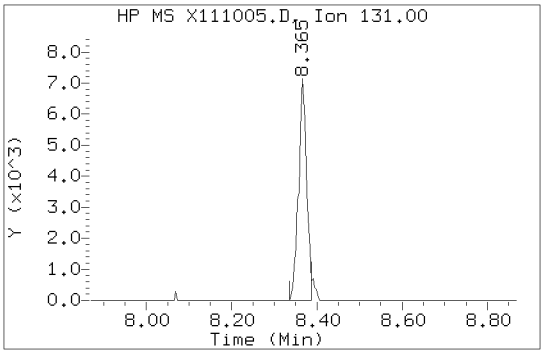
BEFORE

MASS
131
AREA
10142
HEIGHT
7142
17-Nov-2022
13:58
linh
pham



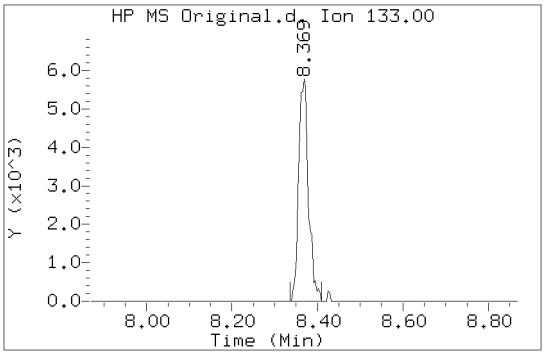
AFTER

MASS
131
AREA
9769
HEIGHT
7142
17-Nov-2022
14:02
linh
pham



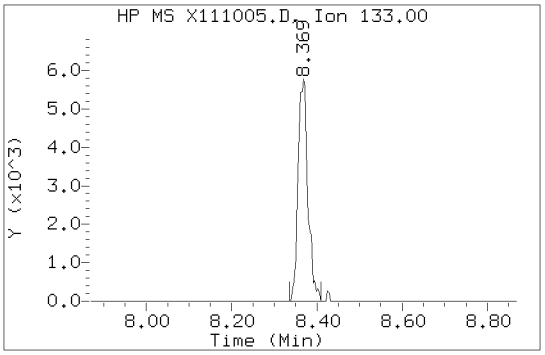
BEFORE

MASS
133
AREA
9501
HEIGHT
5781
17-Nov-2022
13:58
linh
pham



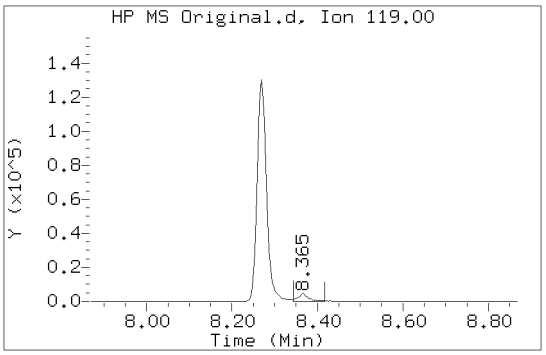
AFTER

MASS
133
AREA
9501
HEIGHT
5781
17-Nov-2022
14:02
linh
pham



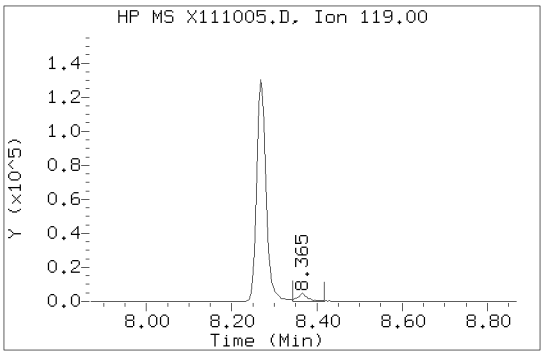
BEFORE

MASS
119
AREA
7802
HEIGHT
4839
17-Nov-2022
13:58
linh
pham



AFTER

MASS
119
AREA
7802
HEIGHT
4839
17-Nov-2022
14:02
linh
pham



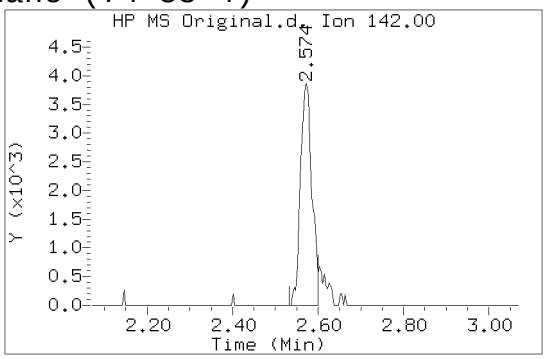
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Iodomethane (74-88-4)

Reason Code:

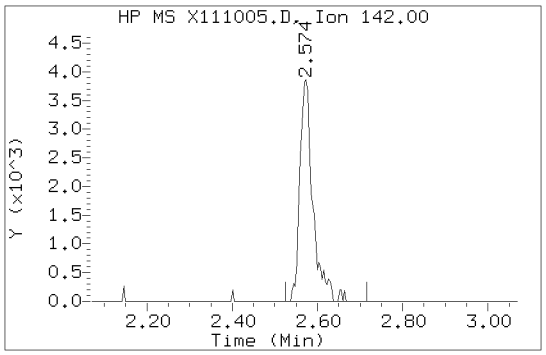
BEFORE

MASS
142
AREA
7383
HEIGHT
3862
17-Nov-2022
13:58
linh
pham



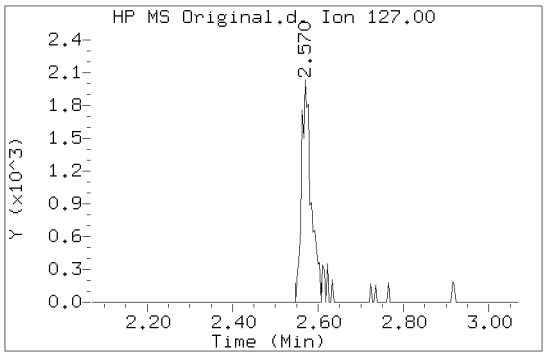
AFTER

MASS
142
AREA
8375
HEIGHT
3862
17-Nov-2022
14:02
linh
pham



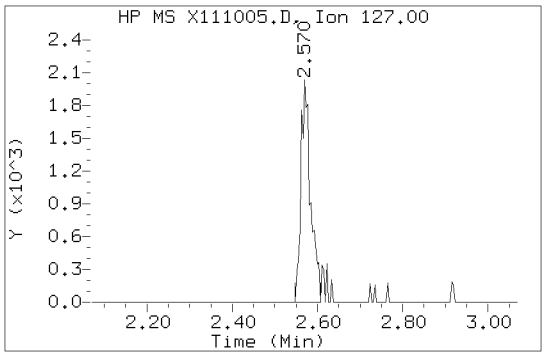
BEFORE

MASS
127
AREA
3270
HEIGHT
2032
17-Nov-2022
13:58
linh
pham



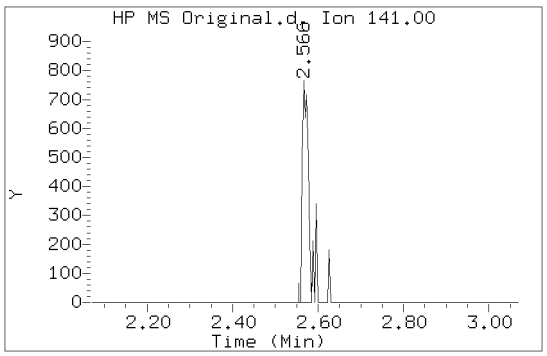
AFTER

MASS
127
AREA
3270
HEIGHT
2032
17-Nov-2022
14:02
linh
pham



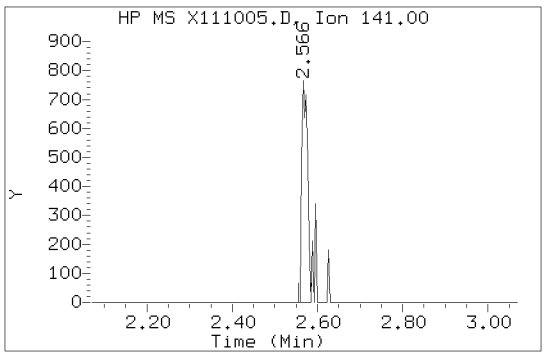
BEFORE

MASS
141
AREA
744
HEIGHT
765
17-Nov-2022
13:58
linh
pham



AFTER

MASS
141
AREA
744
HEIGHT
765
17-Nov-2022
14:02
linh
pham

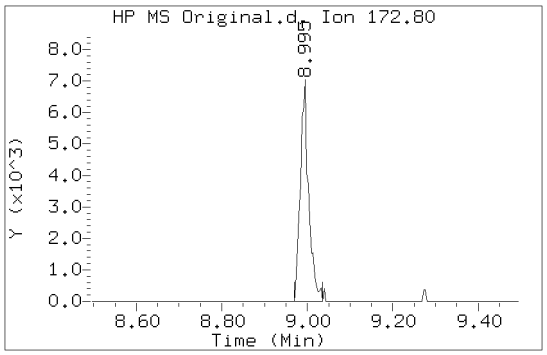


Bromoform (75-25-2)

Reason Code:

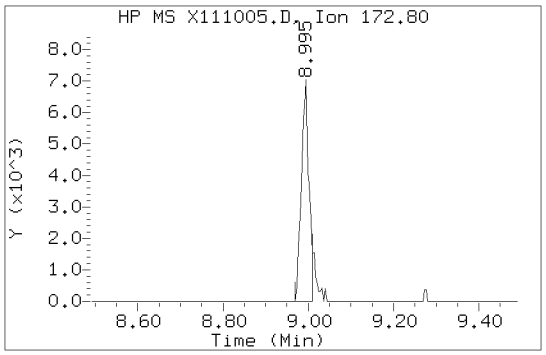
BEFORE

MASS
172.8
AREA
9797
HEIGHT
7043
17-Nov-2022
13:58
linh
pham



AFTER

MASS
172.8
AREA
8918
HEIGHT
7043
17-Nov-2022
14:02
linh
pham

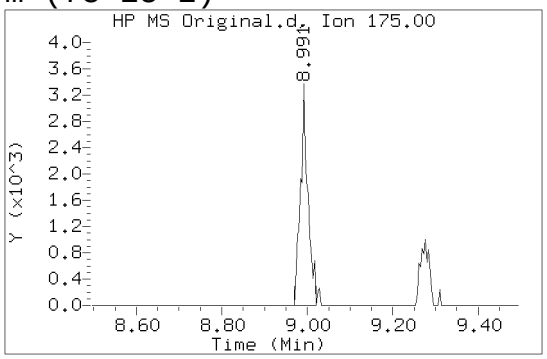


Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

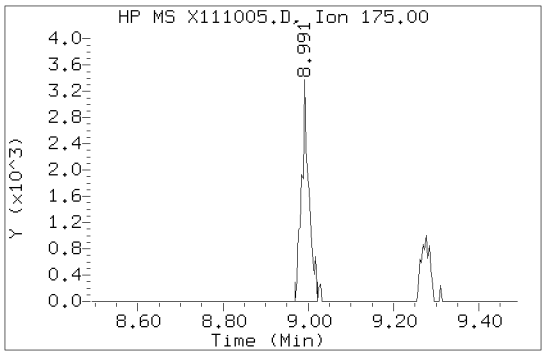
Bromoform (75-25-2)

Reason Code:

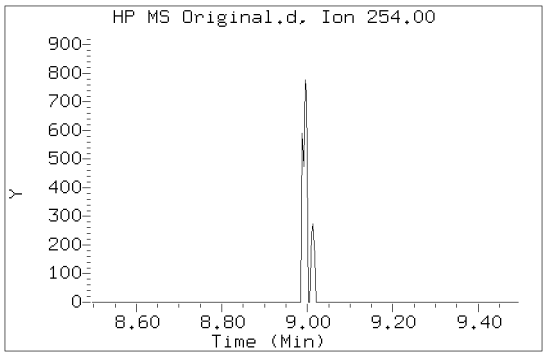
BEFORE
MASS
175
AREA
4154
HEIGHT
3377
17-Nov-2022
13:58
linh
pham



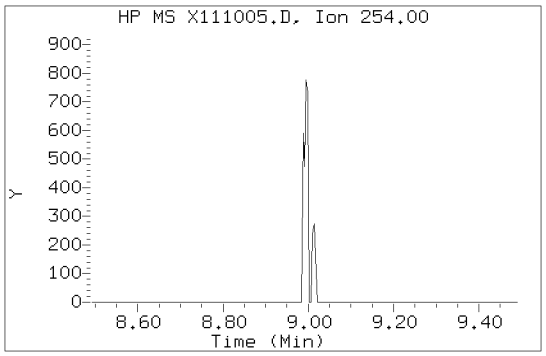
AFTER
MASS
175
AREA
4154
HEIGHT
3377
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
254
AREA
0
HEIGHT
0
17-Nov-2022
13:58
linh
pham



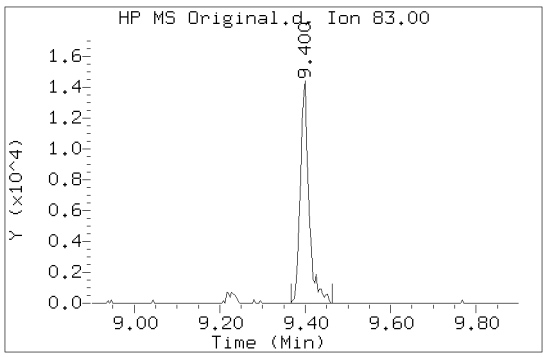
AFTER
MASS
254
AREA
0
HEIGHT
0
17-Nov-2022
14:02
linh
pham



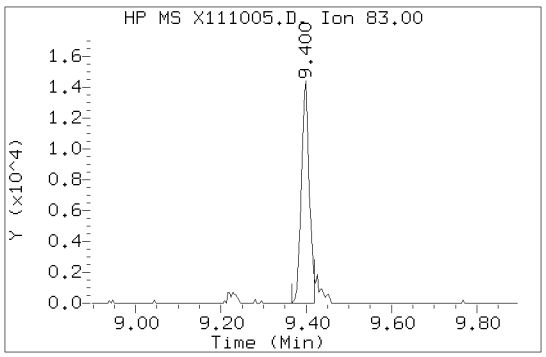
1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

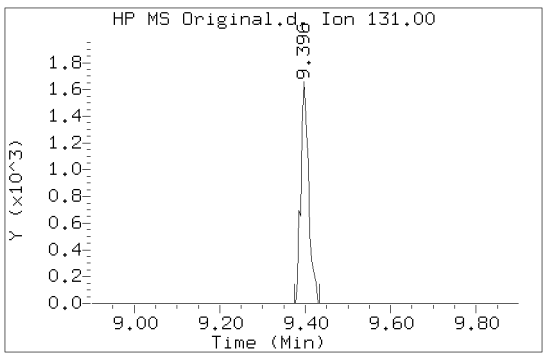
BEFORE
MASS
83
AREA
20901
HEIGHT
14400
17-Nov-2022
13:58
linh
pham



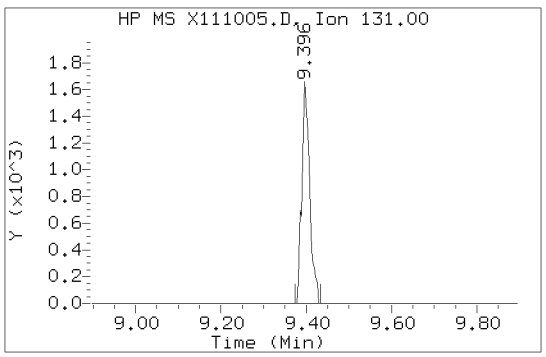
AFTER
MASS
83
AREA
19087
HEIGHT
14400
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
131
AREA
2194
HEIGHT
1658
17-Nov-2022
13:58
linh
pham



AFTER
MASS
131
AREA
2194
HEIGHT
1658
17-Nov-2022
14:02
linh
pham



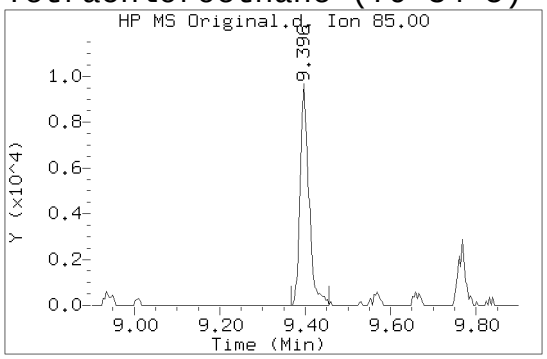
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

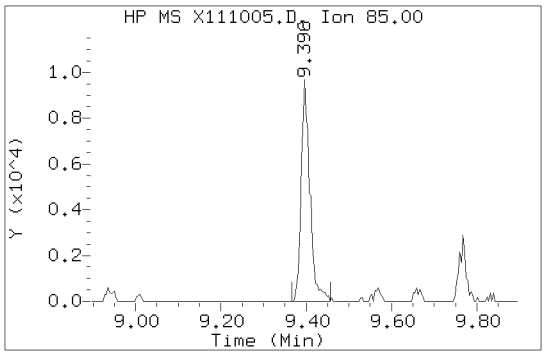
BEFORE

MASS
85
AREA
14147
HEIGHT
9682
17-Nov-2022
13:58
linh
pham



AFTER

MASS
85
AREA
14147
HEIGHT
9682
17-Nov-2022
14:02
linh
pham

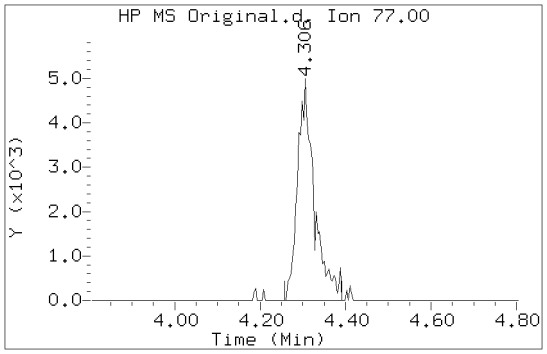


2,2-Dichloropropane (594-20-7)

Reason Code:

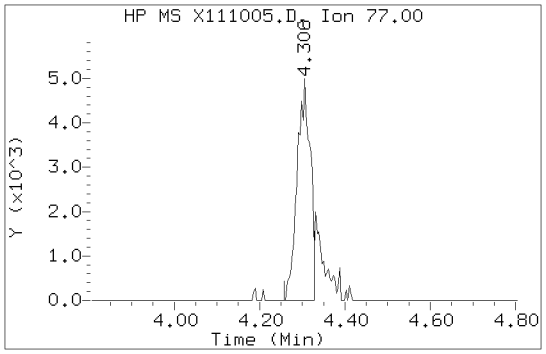
BEFORE

MASS
77
AREA
13778
HEIGHT
4995
17-Nov-2022
13:58
linh
pham



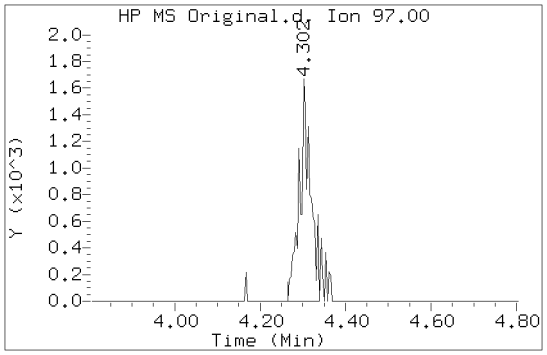
AFTER

MASS
77
AREA
10868
HEIGHT
4995
17-Nov-2022
14:02
linh
pham



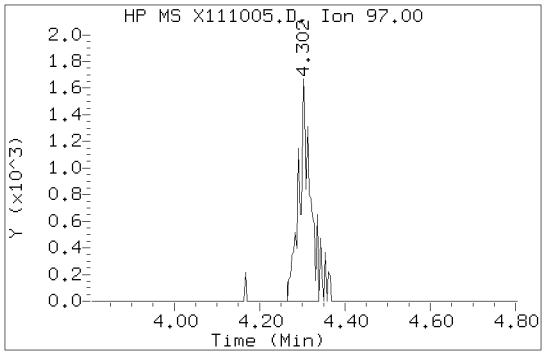
BEFORE

MASS
97
AREA
2988
HEIGHT
1669
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
2988
HEIGHT
1669
17-Nov-2022
14:02
linh
pham

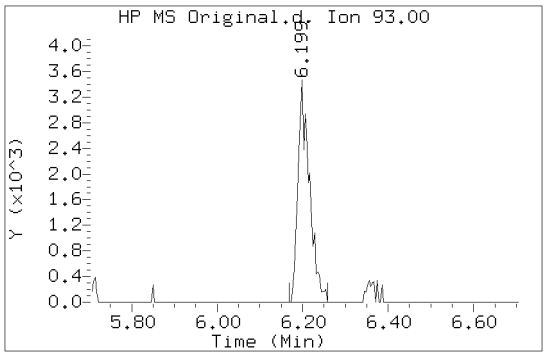


Dibromomethane (74-95-3)

Reason Code:

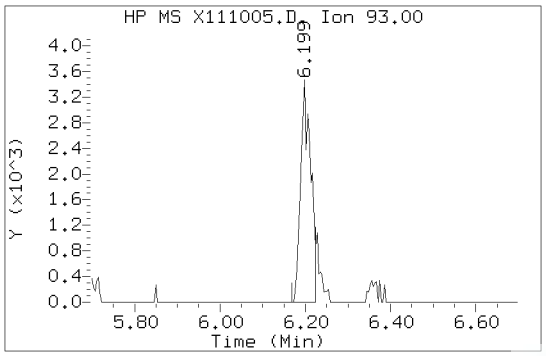
BEFORE

MASS
93
AREA
6601
HEIGHT
3468
17-Nov-2022
13:58
linh
pham



AFTER

MASS
93
AREA
5896
HEIGHT
3468
17-Nov-2022
14:02
linh
pham



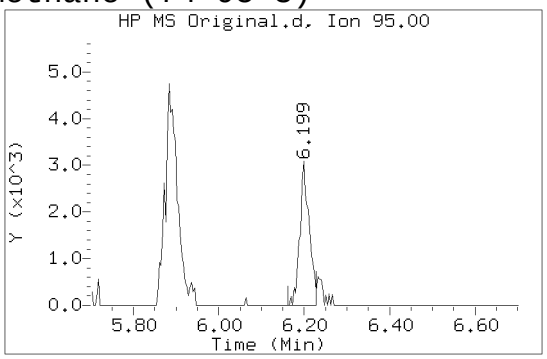
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Dibromomethane (74-95-3)

Reason Code:

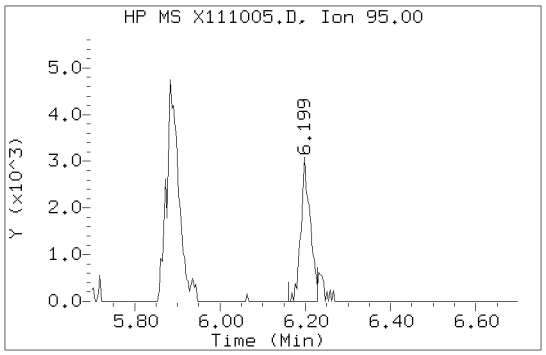
BEFORE

MASS
95
AREA
4829
HEIGHT
3091
17-Nov-2022
13:58
linh
pham



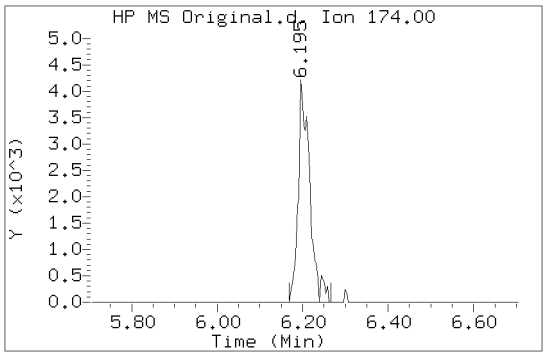
AFTER

MASS
95
AREA
4829
HEIGHT
3091
17-Nov-2022
14:02
linh
pham



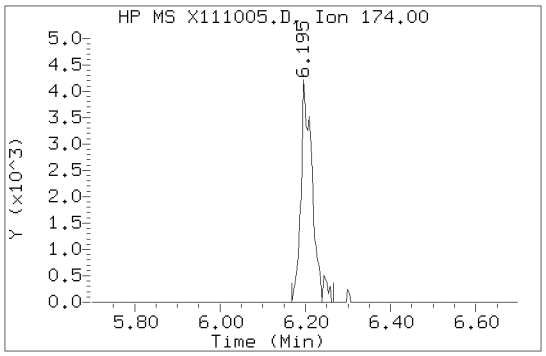
BEFORE

MASS
174
AREA
8031
HEIGHT
4214
17-Nov-2022
13:58
linh
pham



AFTER

MASS
174
AREA
8031
HEIGHT
4214
17-Nov-2022
14:02
linh
pham

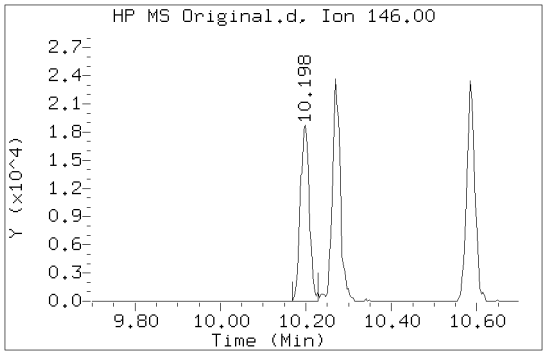


1,3-Dichlorobenzene (541-73-1)

Reason Code:

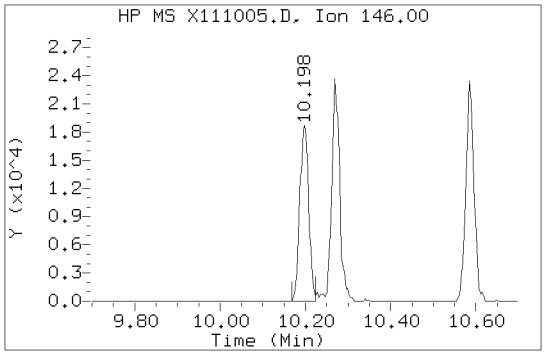
BEFORE

MASS
146
AREA
28275
HEIGHT
18712
17-Nov-2022
13:58
linh
pham



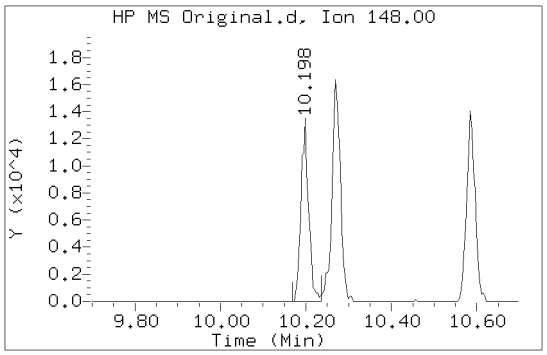
AFTER

MASS
146
AREA
28057
HEIGHT
18712
17-Nov-2022
14:02
linh
pham



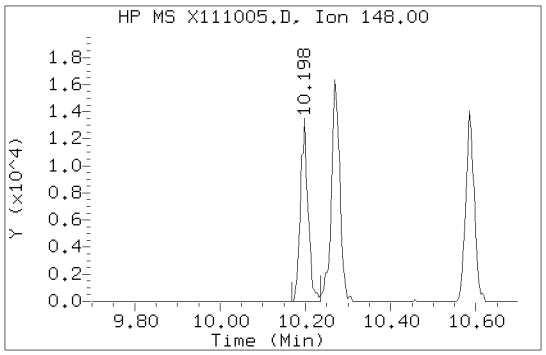
BEFORE

MASS
148
AREA
17243
HEIGHT
13548
17-Nov-2022
13:58
linh
pham



AFTER

MASS
148
AREA
17243
HEIGHT
13548
17-Nov-2022
14:02
linh
pham



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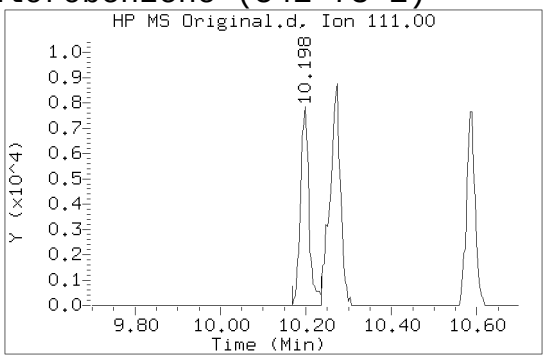
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,3-Dichlorobenzene (541-73-1)

Reason Code:

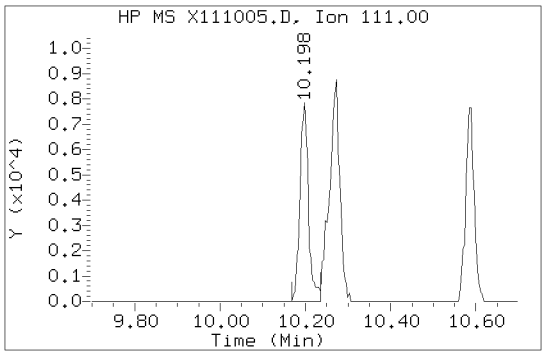
BEFORE

MASS
111
AREA
11326
HEIGHT
7849
17-Nov-2022
13:58
linh
pham



AFTER

MASS
111
AREA
11326
HEIGHT
7849
17-Nov-2022
14:02
linh
pham

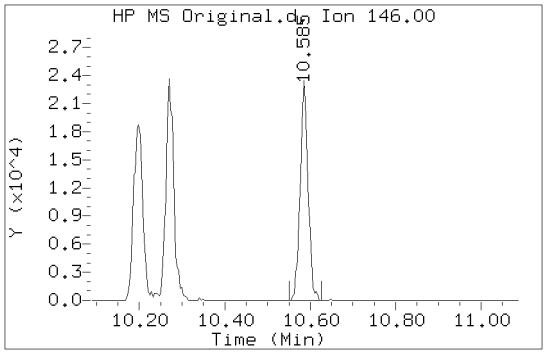


1,2-Dichlorobenzene (95-50-1)

Reason Code:

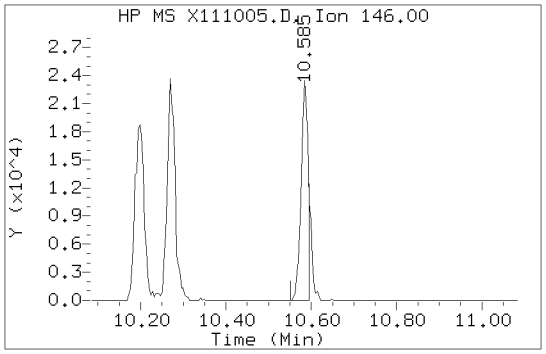
BEFORE

MASS
146
AREA
30954
HEIGHT
23448
17-Nov-2022
13:58
linh
pham



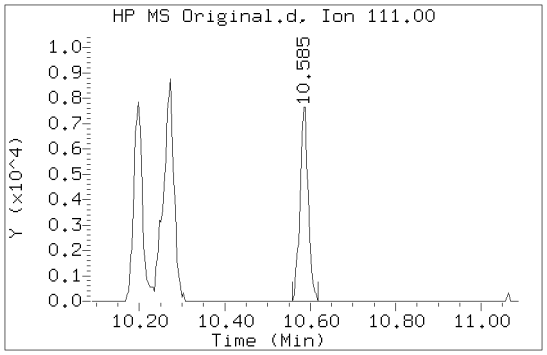
AFTER

MASS
146
AREA
27258
HEIGHT
23448
17-Nov-2022
14:02
linh
pham



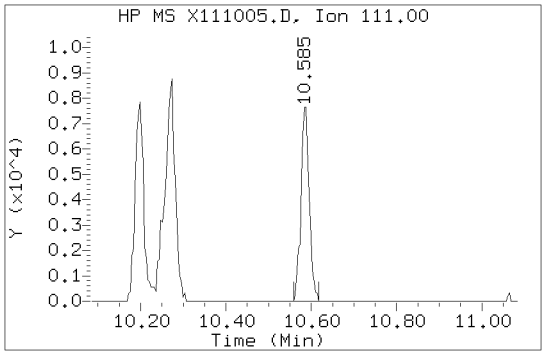
BEFORE

MASS
111
AREA
10604
HEIGHT
7663
17-Nov-2022
13:58
linh
pham



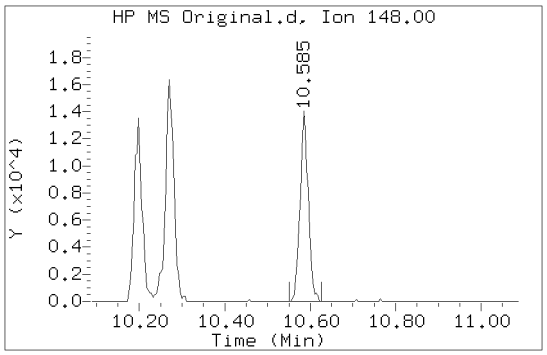
AFTER

MASS
111
AREA
10604
HEIGHT
7663
17-Nov-2022
14:02
linh
pham



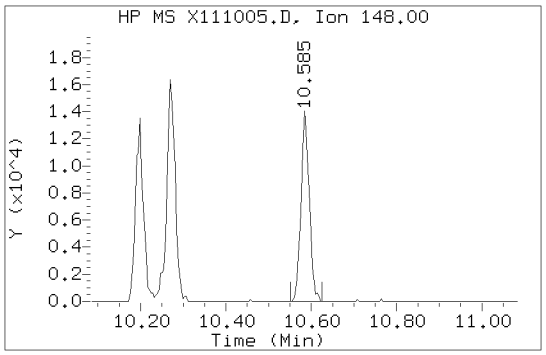
BEFORE

MASS
148
AREA
19282
HEIGHT
14068
17-Nov-2022
13:58
linh
pham



AFTER

MASS
148
AREA
19282
HEIGHT
14068
17-Nov-2022
14:02
linh
pham



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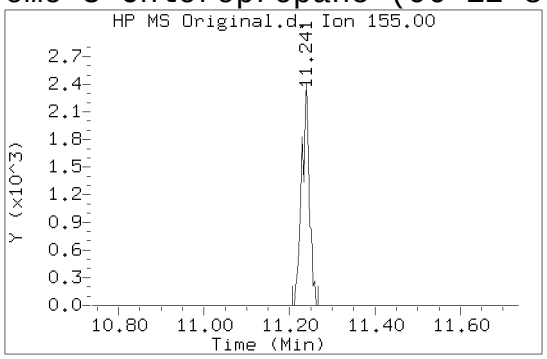
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

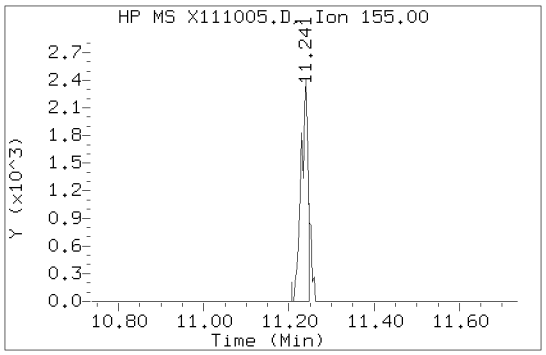
BEFORE

MASS
155
AREA
3095
HEIGHT
2405
17-Nov-2022
13:58
linh
pham



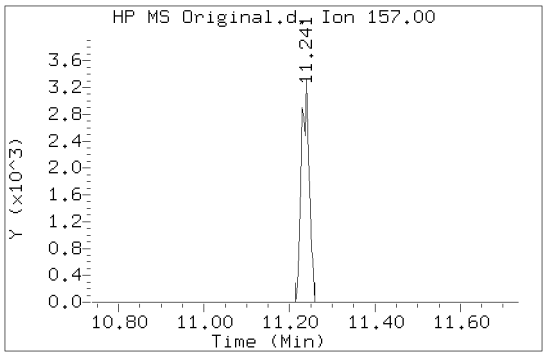
AFTER

MASS
155
AREA
2803
HEIGHT
2405
17-Nov-2022
14:02
linh
pham



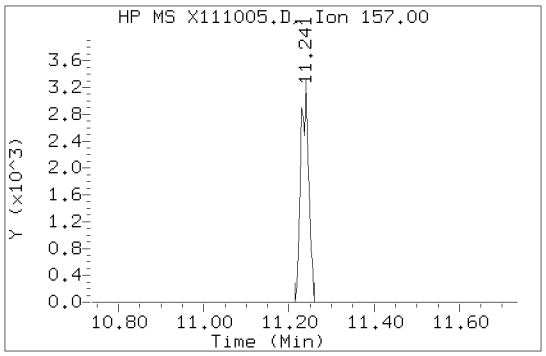
BEFORE

MASS
157
AREA
4371
HEIGHT
3314
17-Nov-2022
13:58
linh
pham



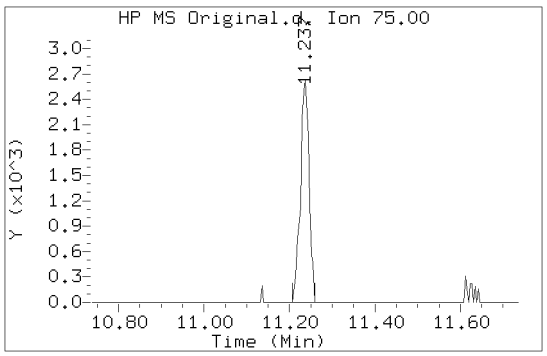
AFTER

MASS
157
AREA
4371
HEIGHT
3314
17-Nov-2022
14:02
linh
pham



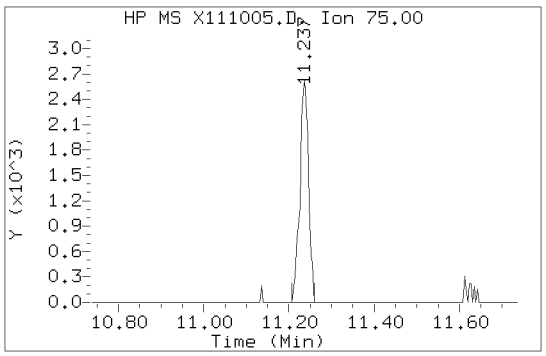
BEFORE

MASS
75
AREA
3838
HEIGHT
2620
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
3838
HEIGHT
2620
17-Nov-2022
14:02
linh
pham

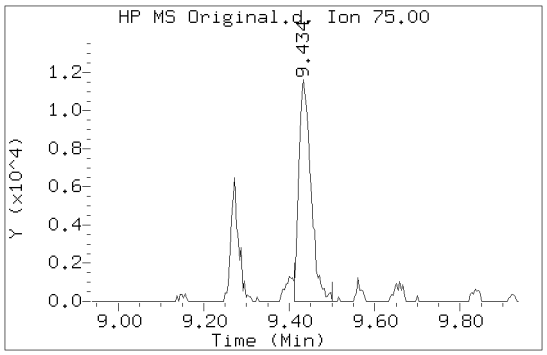


1,2,3-Trichloropropane (96-18-4)

Reason Code:

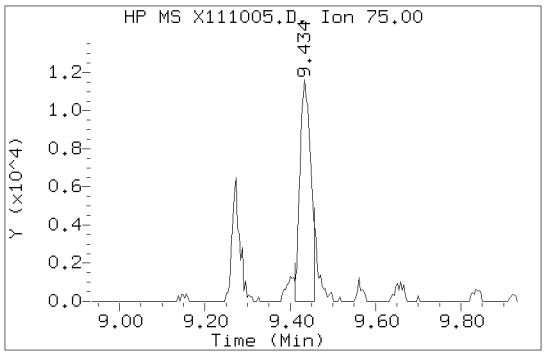
BEFORE

MASS
75
AREA
23429
HEIGHT
11620
17-Nov-2022
13:58
linh
pham



AFTER

MASS
75
AREA
20865
HEIGHT
11620
17-Nov-2022
14:02
linh
pham



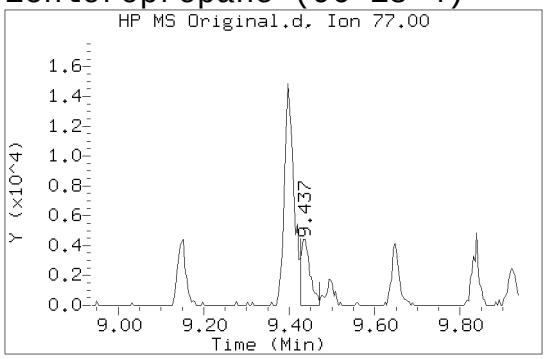
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,2,3-Trichloropropane (96-18-4)

Reason Code:

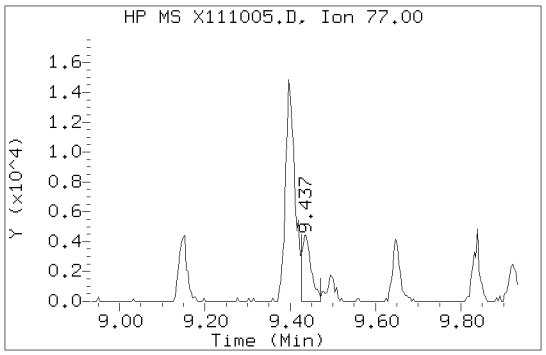
BEFORE

MASS
77
AREA
6835
HEIGHT
4442
17-Nov-2022
13:58
linh
pham



AFTER

MASS
77
AREA
6835
HEIGHT
4442
17-Nov-2022
14:02
linh
pham

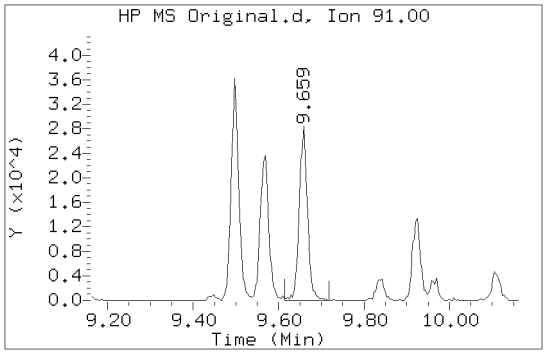


4-Chlorotoluene (106-43-4)

Reason Code:

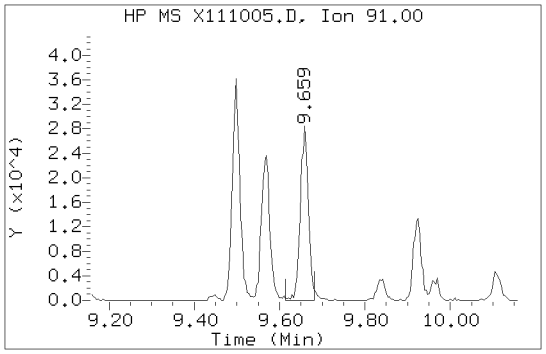
BEFORE

MASS
91
AREA
39004
HEIGHT
28440
17-Nov-2022
13:58
linh
pham



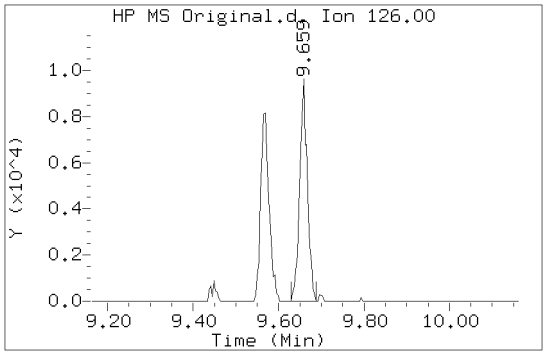
AFTER

MASS
91
AREA
38071
HEIGHT
28440
17-Nov-2022
14:02
linh
pham



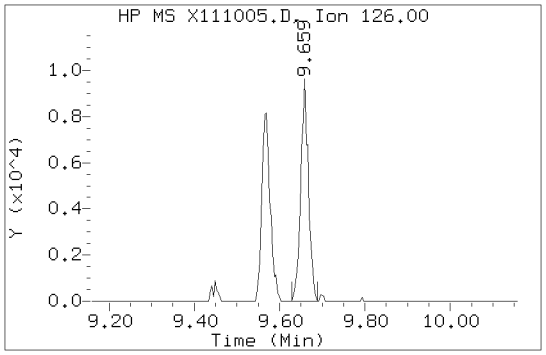
BEFORE

MASS
126
AREA
12285
HEIGHT
9635
17-Nov-2022
13:58
linh
pham



AFTER

MASS
126
AREA
12285
HEIGHT
9635
17-Nov-2022
14:02
linh
pham

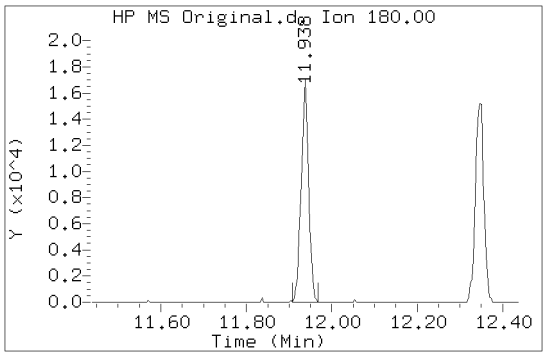


1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

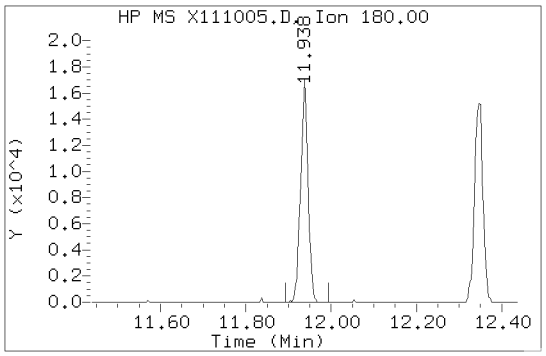
BEFORE

MASS
180
AREA
21205
HEIGHT
17008
17-Nov-2022
13:58
linh
pham



AFTER

MASS
180
AREA
21248
HEIGHT
17008
17-Nov-2022
14:02
linh
pham



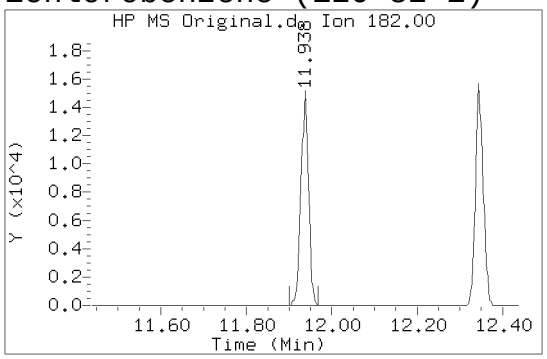
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

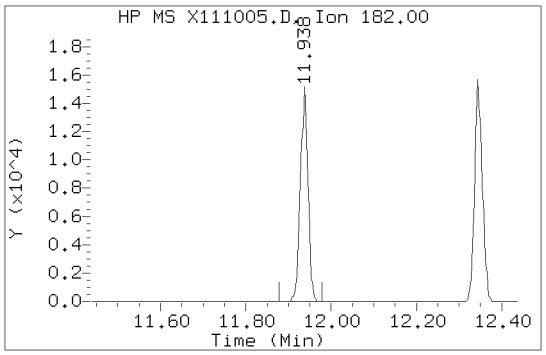
BEFORE

MASS
182
AREA
19444
HEIGHT
15173
17-Nov-2022
13:58
linh
pham



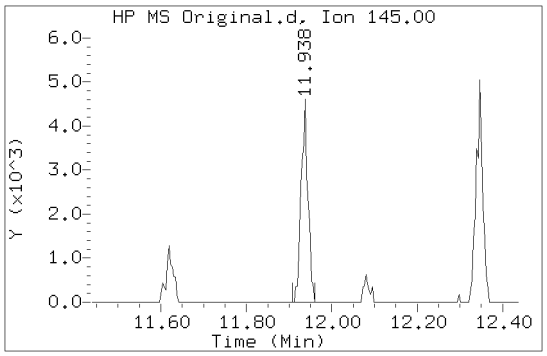
AFTER

MASS
182
AREA
19447
HEIGHT
15173
17-Nov-2022
14:02
linh
pham



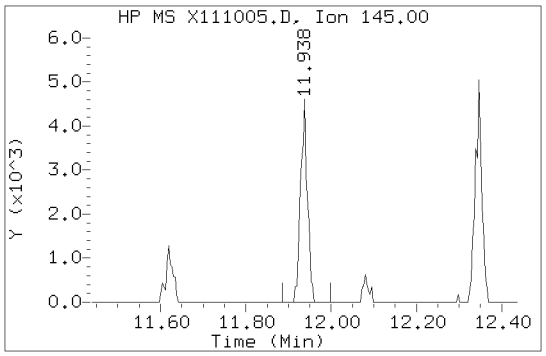
BEFORE

MASS
145
AREA
5319
HEIGHT
4610
17-Nov-2022
13:58
linh
pham



AFTER

MASS
145
AREA
5321
HEIGHT
4610
17-Nov-2022
14:02
linh
pham

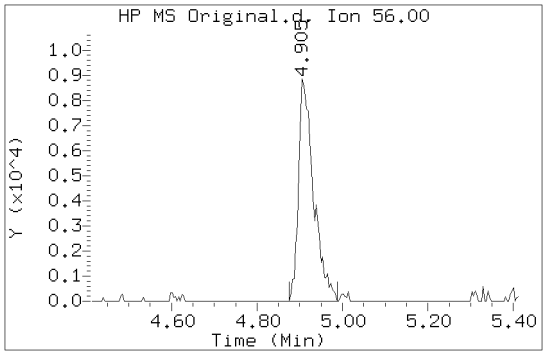


Cyclohexane (110-82-7)

Reason Code:

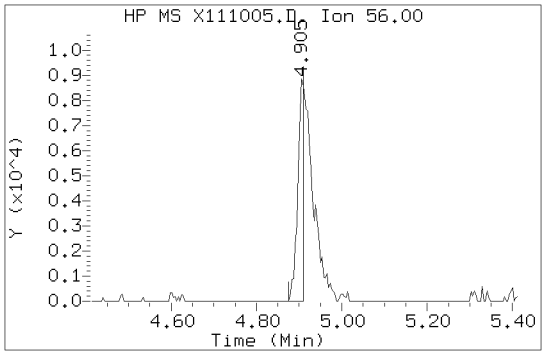
BEFORE

MASS
56
AREA
22085
HEIGHT
8859
17-Nov-2022
13:58
linh
pham



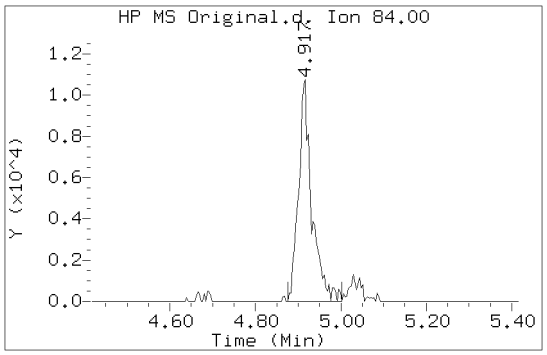
AFTER

MASS
56
AREA
8459
HEIGHT
8859
17-Nov-2022
14:02
linh
pham



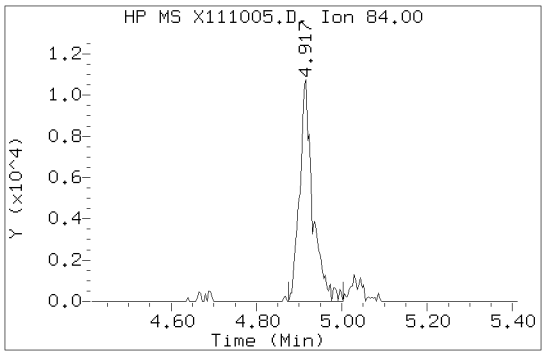
BEFORE

MASS
84
AREA
23688
HEIGHT
10751
17-Nov-2022
13:58
linh
pham



AFTER

MASS
84
AREA
23688
HEIGHT
10751
17-Nov-2022
14:02
linh
pham



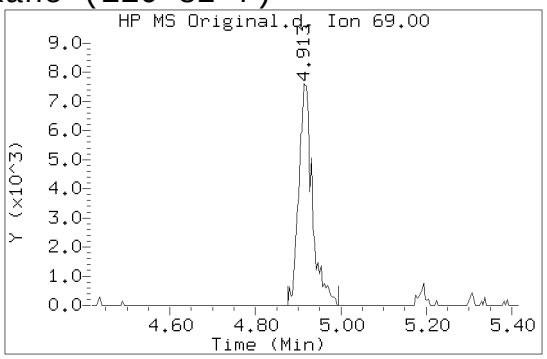
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111005.D
Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Cyclohexane (110-82-7)

Reason Code:

BEFORE

MASS
69
AREA
17151
HEIGHT
7609
17-Nov-2022
13:58
linh
pham



AFTER

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7609
17-Nov-2022
14:02
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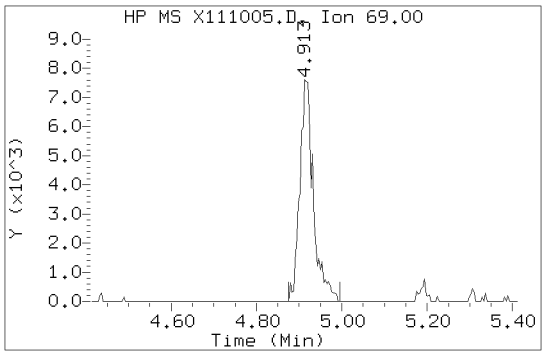

Freon TF (76-13-1)

Reason Code:

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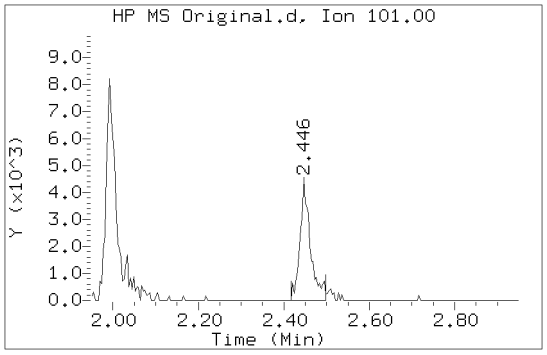

AFTER

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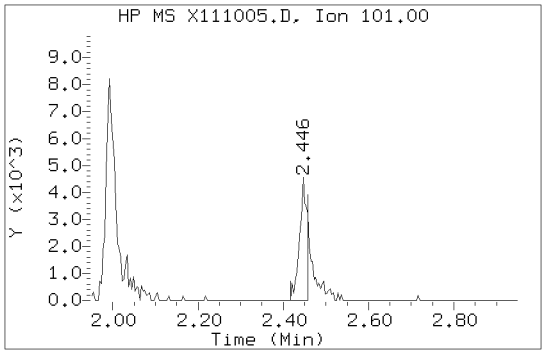

BEFORE

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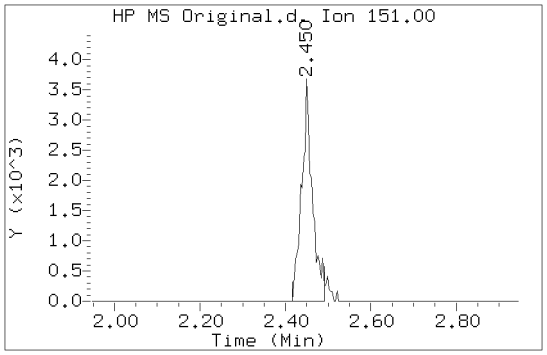

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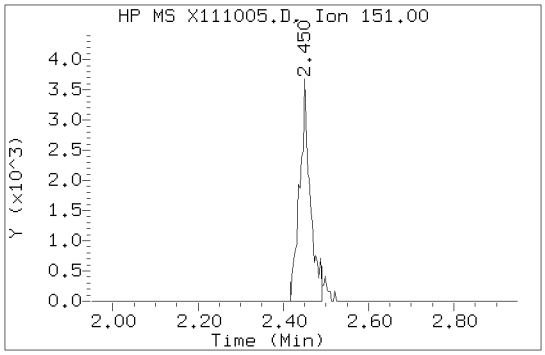

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

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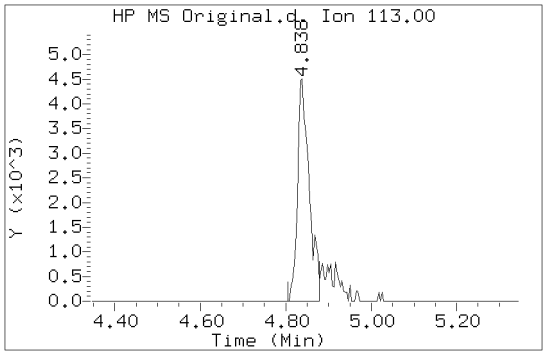

AFTER

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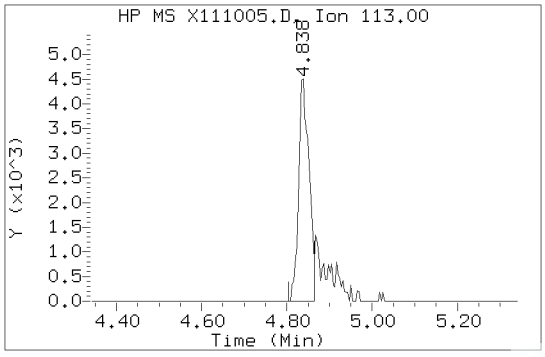

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Inj Date : 10-NOV-2022 14:35
InstruID : voa10.i
LabSampID : VSTD002

Dibromofluoromethane (1868-53-7)

Reason Code:

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13:58
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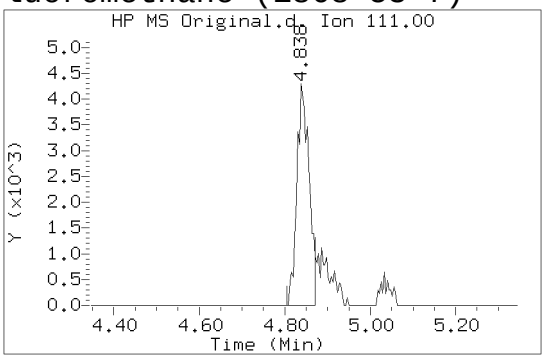

AFTER

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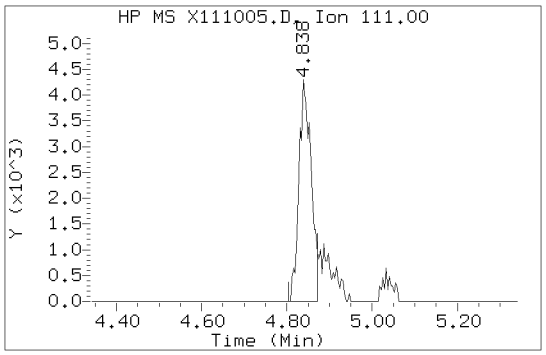

1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

BEFORE

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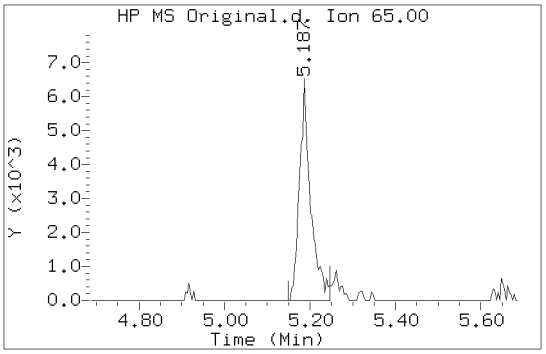

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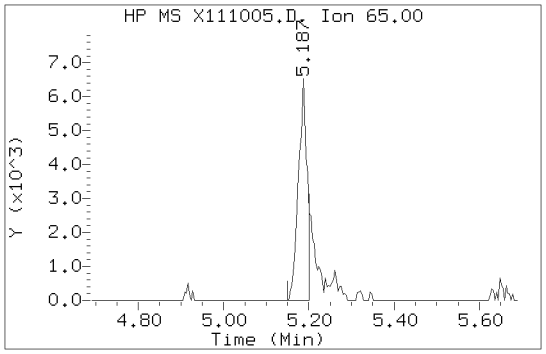

BEFORE

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1637
17-Nov-2022
13:58
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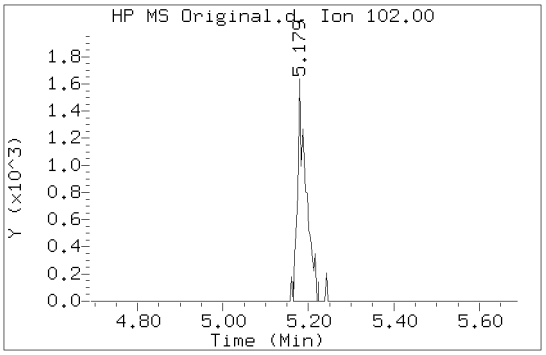

AFTER

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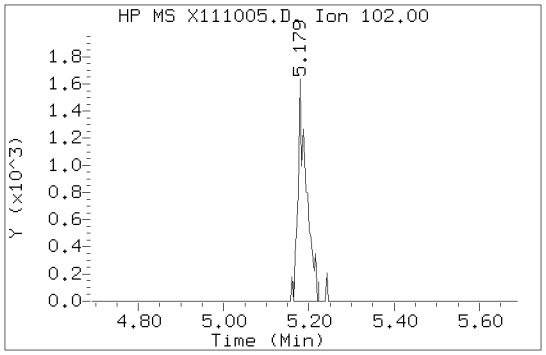

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Reason Code:

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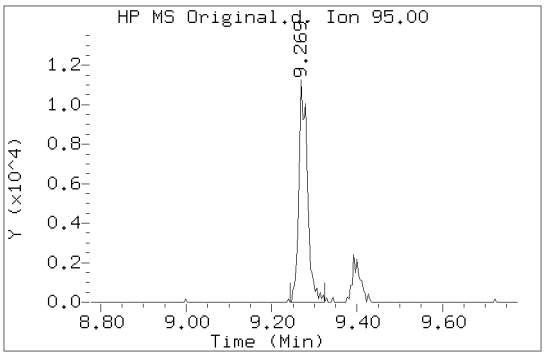

AFTER

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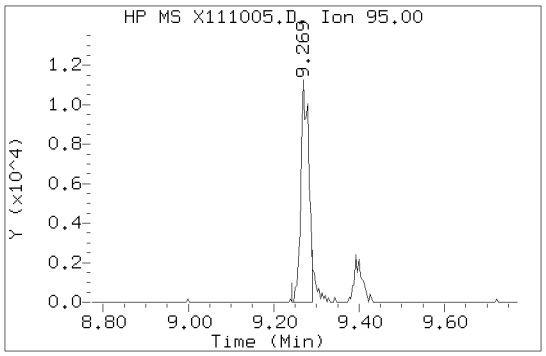

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InstruID : voa10.i
LabSampID : VSTD002

4-Bromofluorobenzene (460-00-4)

Reason Code:

BEFORE

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AREA
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HEIGHT
10418
17-Nov-2022
13:58
linh
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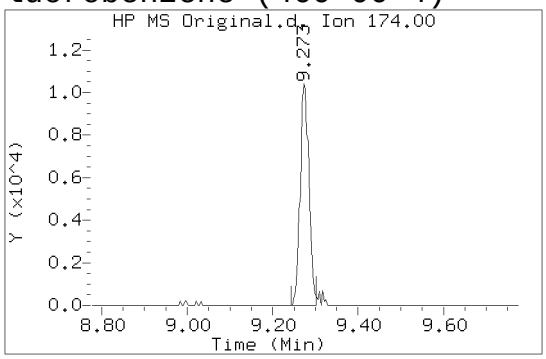

AFTER

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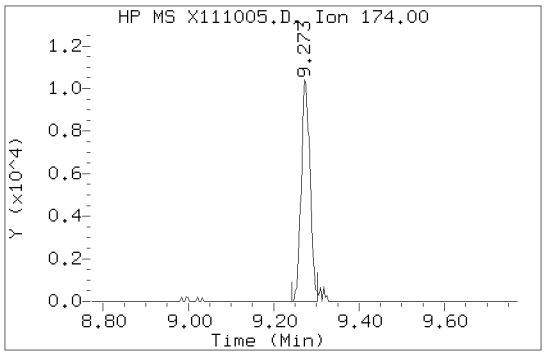

BEFORE

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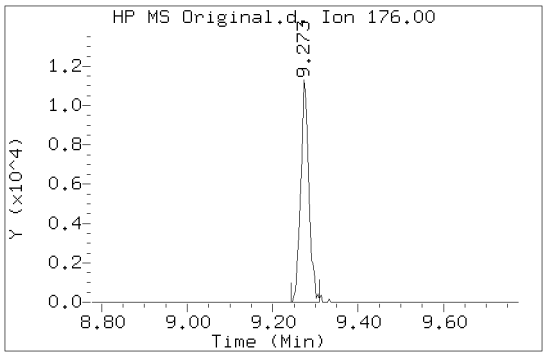

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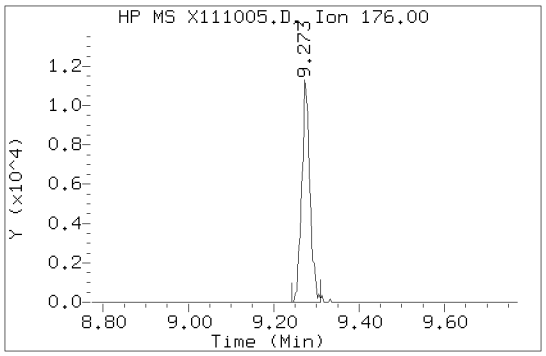

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D Page 1
Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D
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Inj Date : 10-NOV-2022 14:56
Operator : FT Inst ID: voa10.i
Smp Info : VSTD005;VSTD005;1;5;
Misc Info : V10;WATER;0;1;
Comment   :
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Meth Date : 17-Nov-2022 14:02 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 14:35 Cal File: X111005.D
Als bottle: 7 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	444544	50.0000	
2	Dichlorodifluoromethane	85	1.235	1.235	(0.251)	18361	5.00000	4.82(M)
3	Chloromethane	50	1.370	1.370	(0.279)	20687	5.00000	4.97(M)
5	Vinyl Chloride	62	1.452	1.452	(0.295)	19564	5.00000	4.74(M)
6	Bromomethane	94	1.703	1.703	(0.347)	9230	5.00000	4.95(M)
7	Chloroethane	64	1.786	1.786	(0.363)	11774	5.00000	4.95(M)
8	Trichlorofluoromethane	101	1.992	1.992	(0.405)	26961	5.00000	4.97(M)
9	Acrolein	56	2.341	2.341	(0.476)	1818	10.0000	8.63(M)
10	Acetone	43	2.491	2.491	(0.507)	24899	10.0000	8.98
12	Isobutyl Alcohol	43	5.373	5.373	(1.093)	63767	100.000	91.99
13	Acetonitrile	39	2.772	2.772	(0.564)	32937	50.0000	52.96
16	Acrylonitrile	53	3.147	3.147	(0.640)	17495	10.0000	10.67(M)
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	16202	5.00000	5.64(M)
15	Iodomethane	142	2.569	2.569	(0.523)	22802	10.0000	10.70(M)
17	Methylene Chloride	84	2.903	2.903	(0.591)	21548	5.00000	4.60(M)
18	Methyl tert-butyl ether	73	3.195	3.195	(0.650)	59479	5.00000	5.23
19	Carbon Disulfide	76	2.629	2.629	(0.535)	82677	10.0000	10.20
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	16193	5.00000	4.76(M)
22	1,1-Dichloroethane	63	3.634	3.634	(0.739)	35092	5.00000	5.36(M)
24	2-Butanone	43	4.354	4.354	(0.886)	26817	10.0000	11.63

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	20918	5.00000	5.17(M)
28 Chloroform	83	4.676	4.676 (0.951)	40131	5.00000	5.49

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D Page 2
Report Date: 17-Nov-2022 14:03

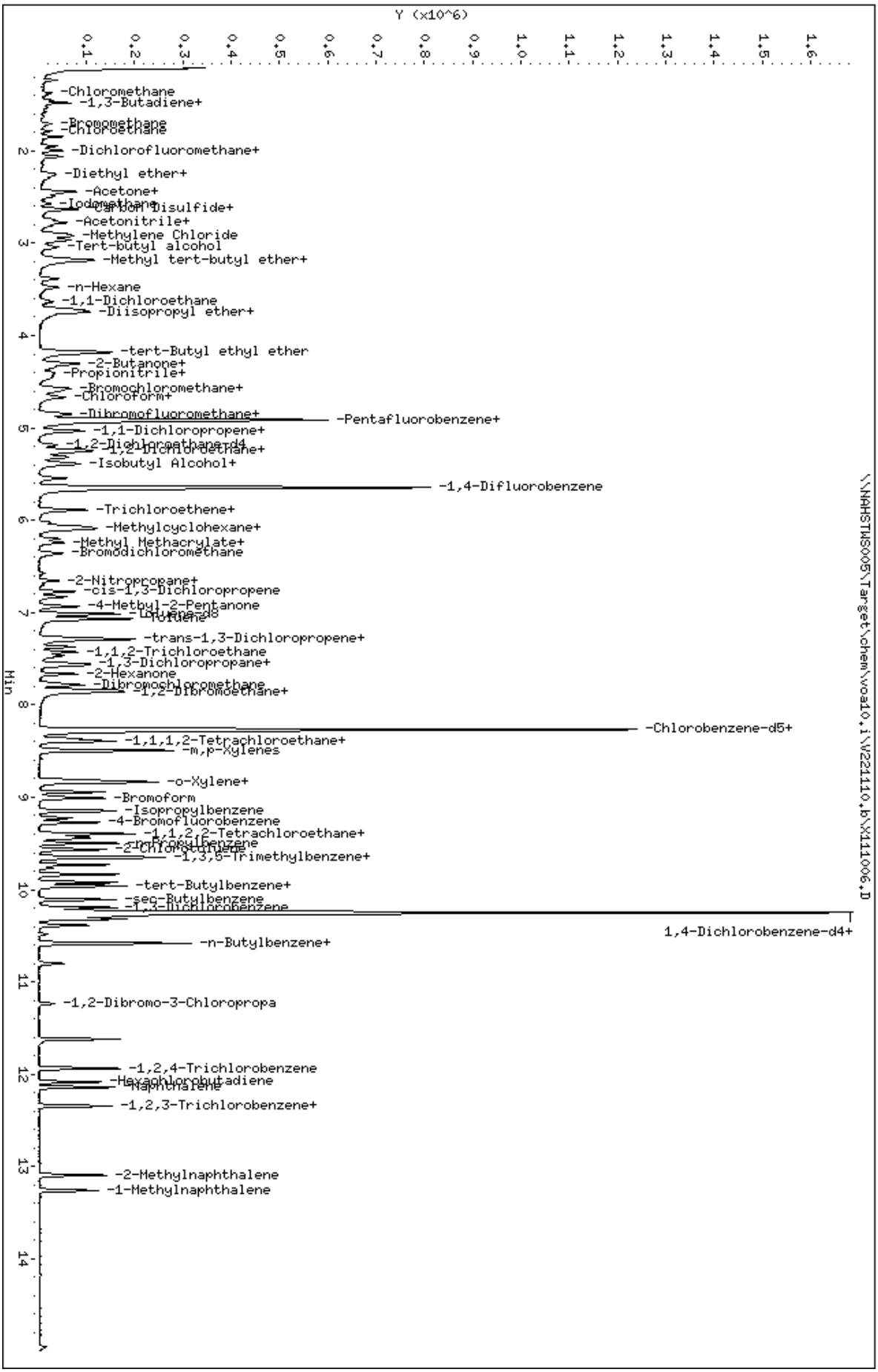
		QUANT SIG					AMOUNTS	
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.571	4.571	(0.930)	11352	5.00000	5.61(M)
$	30 Dibromofluoromethane	113	4.845	4.845	(0.986)	20848	5.00000	5.55(M)
	31 1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	31665	5.00000	5.39(M)
	32 1,1-Dichloropropene	75	5.028	5.028	(0.890)	26249	5.00000	4.83(M)
	33 1,2-Dichloroethane	62	5.261	5.261	(0.932)	35379	5.00000	5.43
	34 Carbon Tetrachloride	117	5.036	5.036	(0.892)	23109	5.00000	4.92(MH)
$	35 1,2-Dichloroethane-d4	65	5.182	5.182	(1.054)	26090	5.00000	5.46(M)
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	703869	50.0000	
	37 Benzene	78	5.242	5.242	(0.928)	97042	5.00000	5.41
	38 Trichloroethene	130	5.887	5.887	(1.042)	23927	5.00000	5.21
	39 Bromodichloromethane	83	6.359	6.359	(1.126)	30199	5.00000	5.40
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	25801	5.00000	5.15(M)
	45 4-Methyl-2-Pentanone	43	6.925	6.925	(0.838)	57554	10.0000	13.08
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.199)	36754	5.00000	4.92
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	600158	50.0000	
$	48 Toluene-d8	98	7.015	7.015	(0.849)	74726	5.00000	5.18
	50 Toluene	91	7.068	7.068	(0.855)	89331	5.00000	5.05
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.287)	31438	5.00000	4.78
	52 2-Hexanone	43	7.668	7.668	(0.927)	46018	10.0000	13.36
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	18952	5.00000	5.35
	54 1,3-Dichloropropane	76	7.578	7.578	(0.917)	36977	5.00000	5.08
	55 Dibromochloromethane	129	7.765	7.765	(0.939)	21706	5.00000	4.69
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	19101	5.00000	5.20(M)
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	22809	5.00000	5.26
	59 Chlorobenzene	112	8.294	8.294	(1.003)	58785	5.00000	4.86
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	20698	5.00000	4.78
	61 Ethylbenzene	106	8.395	8.395	(1.015)	29627	5.00000	5.01
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	72927	10.0000	10.01
	63 o-Xylene	106	8.830	8.830	(1.068)	35870	5.00000	4.93
	64 Styrene	104	8.841	8.841	(1.069)	64096	5.00000	4.85
	66 Bromoform	173	8.991	8.991	(1.088)	16993	5.00000	5.90
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	86735	5.00000	4.80
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	36143	5.00000	5.48
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	33924	5.00000	6.51(M)
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	390372	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	77935	5.00000	4.90
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	68145	5.00000	4.96
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	82304	5.00000	4.76
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	92894	5.00000	4.81
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	79881	5.00000	4.75
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	107529	5.00000	5.04
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	42233	5.00000	5.08
	83 1,3-Dichlorobenzene	146	10.194	10.194	(0.995)	57986	5.00000	4.86
	84 1,4-Dichlorobenzene	146	10.269	10.269	(1.002)	62817	5.00000	6.06
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	60205	5.00000	5.52
	89 1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	6468	5.00000	5.35
	90 1,2,4-Trichlorobenzene	180	11.933	11.933	(1.164)	45748	5.00000	5.57(M)
	92 Naphthalene	128	12.143	12.143	(1.185)	103372	5.00000	4.70
	136 n-Hexane	57	3.480	3.480	(0.708)	19492	5.00000	4.19
	147 Methylcyclohexane	55	6.067	6.067	(1.074)	28658	5.00000	4.44
	141 Cyclohexane	56	4.916	4.916	(1.000)	21996	5.00000	5.35(M)
	138 Freon TF	101	2.449	2.449	(0.498)	14418	5.00000	5.96(M)

146	Methyl Acetate	43	2.806	2.806 (0.571)	18608	5.00000	5.10(M)
21	Vinyl Acetate	43	3.705	3.705 (0.754)	91606	10.0000	10.16(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	29105	5.00000	5.40(M)
	44 Dibromomethane	93	6.202	6.202	(1.098)	14628	5.00000	5.10(M)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	20241	5.00000	5.69
	74 Bromobenzene	156	9.399	9.399	(0.917)	30438	5.00000	5.10
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	67567	5.00000	6.20
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	83683	5.00000	5.03
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	84607	5.00000	4.82
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	42719	5.00000	5.36
	148 tert-Butyl Alcohol	59	3.042	3.042	(0.619)	46486	100.000	83.47
	142 Tetrahydrofuran	42	4.650	4.650	(0.946)	8807	10.0000	9.65
M	94 1,2-Dichloroethylene (total)	96				37111	10.0000	
M	95 Xylenes (total)	106				108797	15.0000	

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Sample Info: VSTD005;VSTD005;1;5;
Purge Volume: 5.0
Column phase: DB624

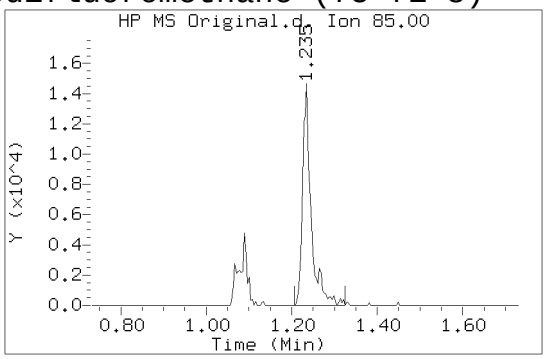
Instrument: voa10.i
Operator: FT
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Dichlorodifluoromethane (75-71-8)

BEFORE

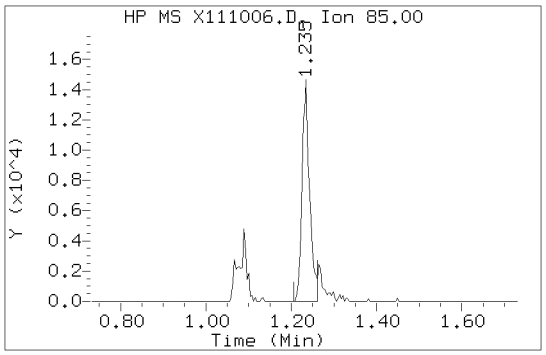
MASS
85
AREA
20865
HEIGHT
14652
17-Nov-2022
13:58
linh
pham



Reason Code:

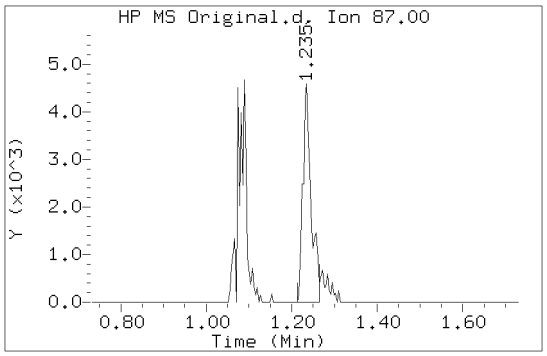
AFTER

MASS
85
AREA
18361
HEIGHT
14652
17-Nov-2022
14:02
linh
pham



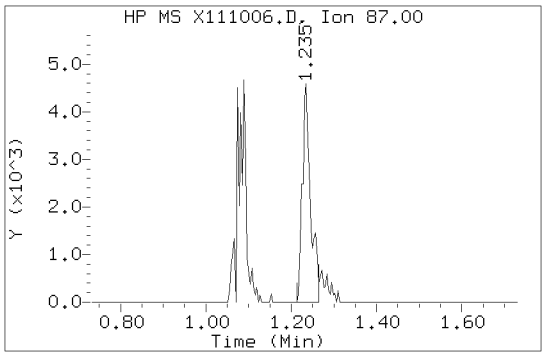
BEFORE

MASS
87
AREA
6337
HEIGHT
4591
17-Nov-2022
13:58
linh
pham



AFTER

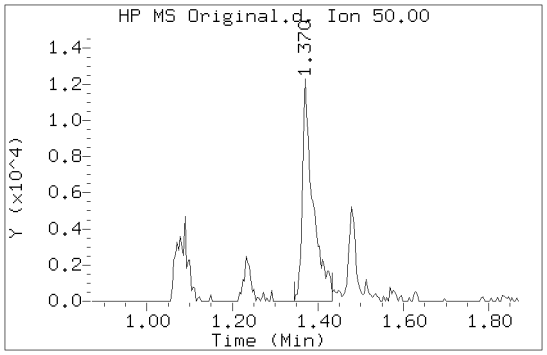
MASS
87
AREA
6337
HEIGHT
4591
17-Nov-2022
14:02
linh
pham



Chloromethane (74-87-3)

BEFORE

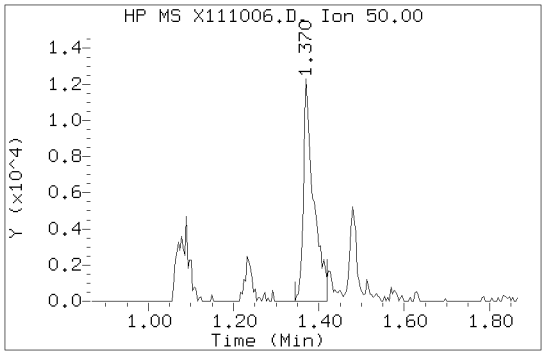
MASS
50
AREA
21816
HEIGHT
12303
17-Nov-2022
13:58
linh
pham



Reason Code:

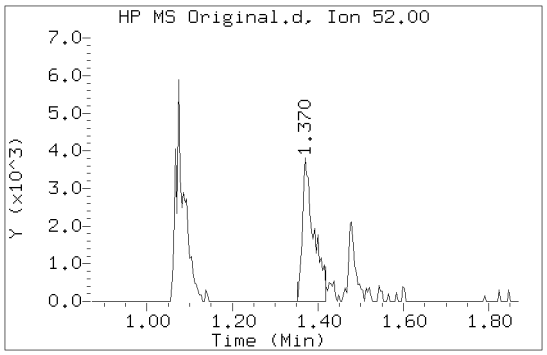
AFTER

MASS
50
AREA
20687
HEIGHT
12303
17-Nov-2022
14:02
linh
pham



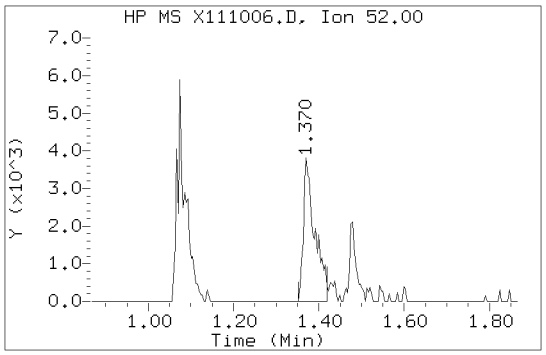
BEFORE

MASS
52
AREA
7195
HEIGHT
3813
17-Nov-2022
13:58
linh
pham



AFTER

MASS
52
AREA
7195
HEIGHT
3813
17-Nov-2022
14:02
linh
pham



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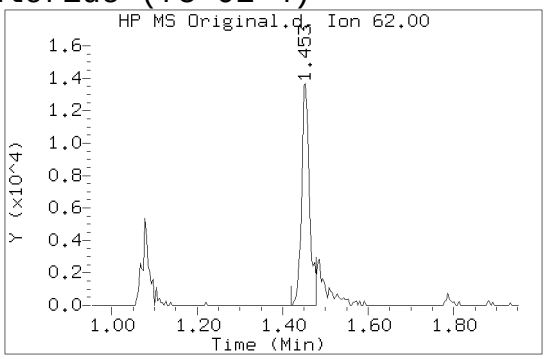
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Vinyl Chloride (75-01-4)

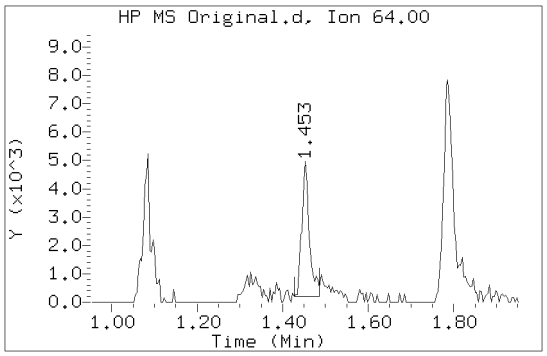
BEFORE

MASS
62
AREA
17995
HEIGHT
13665
17-Nov-2022
13:58
linh
pham



BEFORE

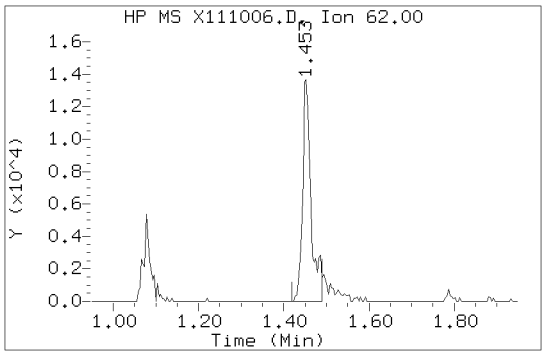
MASS
64
AREA
5965
HEIGHT
4746
17-Nov-2022
13:58
linh
pham



Reason Code:

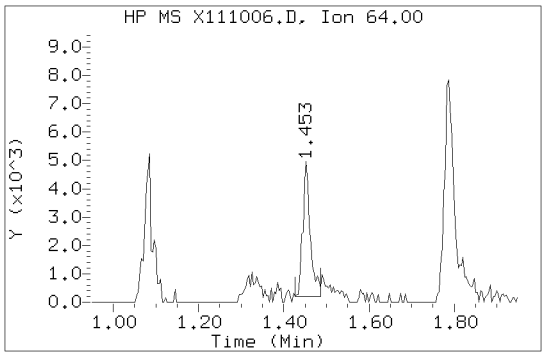
AFTER

MASS
62
AREA
19564
HEIGHT
13665
17-Nov-2022
14:02
linh
pham



AFTER

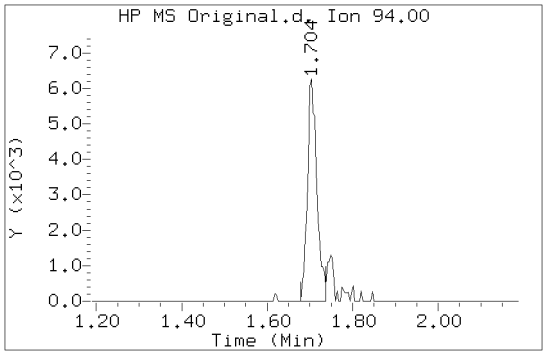
MASS
64
AREA
5965
HEIGHT
4746
17-Nov-2022
14:02
linh
pham



Bromomethane (74-83-9)

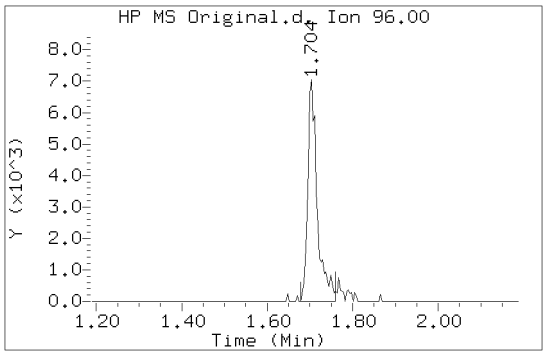
BEFORE

MASS
94
AREA
9729
HEIGHT
6267
17-Nov-2022
13:58
linh
pham



BEFORE

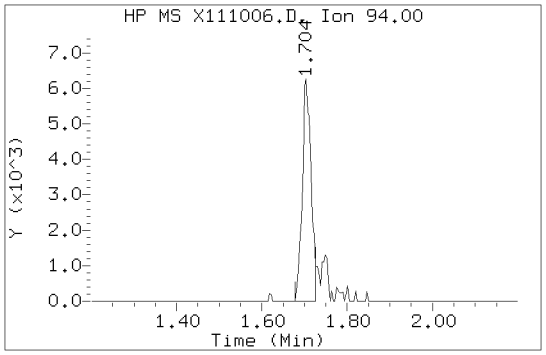
MASS
96
AREA
10945
HEIGHT
7047
17-Nov-2022
13:58
linh
pham



Reason Code:

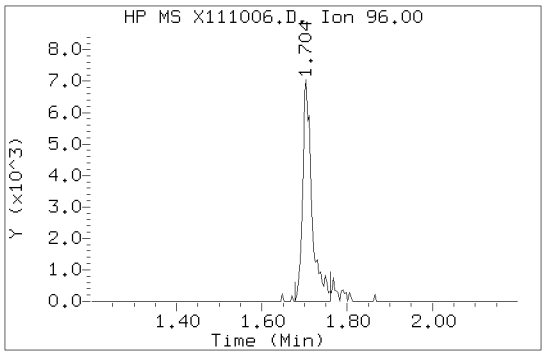
AFTER

MASS
94
AREA
9230
HEIGHT
6267
17-Nov-2022
14:02
linh
pham



AFTER

MASS
96
AREA
10945
HEIGHT
7047
17-Nov-2022
14:02
linh
pham



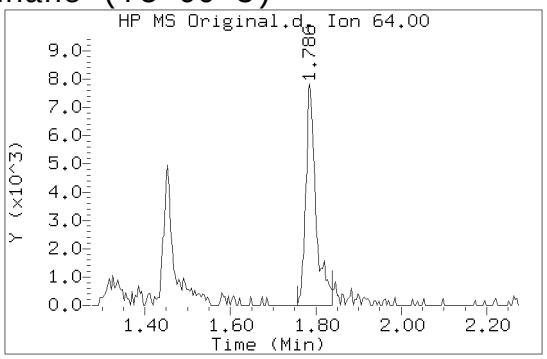
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Chloroethane (75-00-3)

Reason Code:

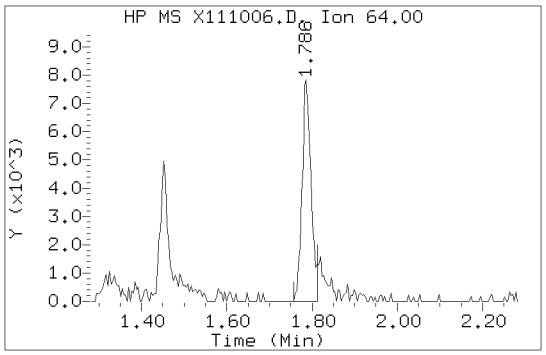
BEFORE

MASS
64
AREA
13248
HEIGHT
7839
17-Nov-2022
13:58
linh
pham



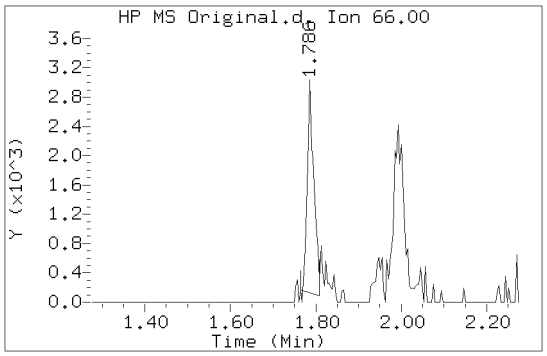
AFTER

MASS
64
AREA
11774
HEIGHT
7839
17-Nov-2022
14:02
linh
pham



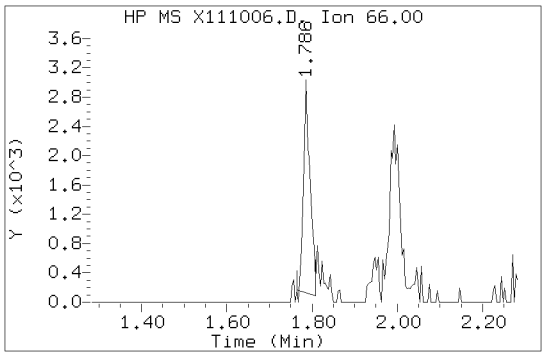
BEFORE

MASS
66
AREA
3176
HEIGHT
2908
17-Nov-2022
13:58
linh
pham



AFTER

MASS
66
AREA
3176
HEIGHT
2908
17-Nov-2022
14:02
linh
pham

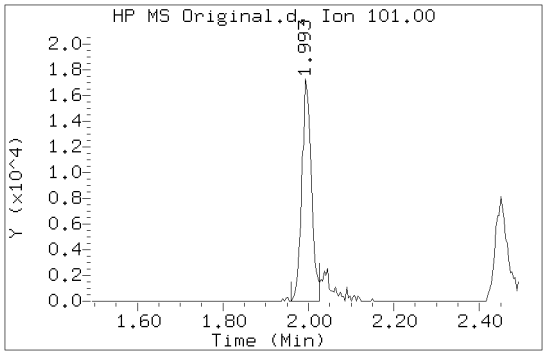


Trichlorofluoromethane (75-69-4)

Reason Code:

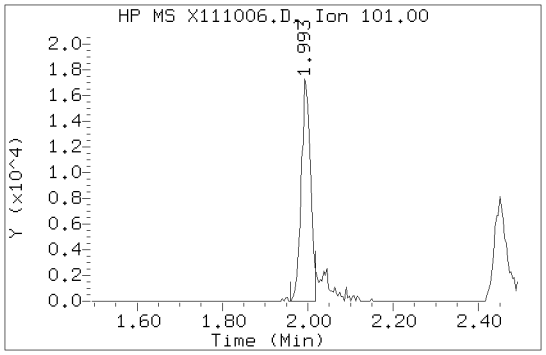
BEFORE

MASS
101
AREA
27685
HEIGHT
17280
17-Nov-2022
13:58
linh
pham



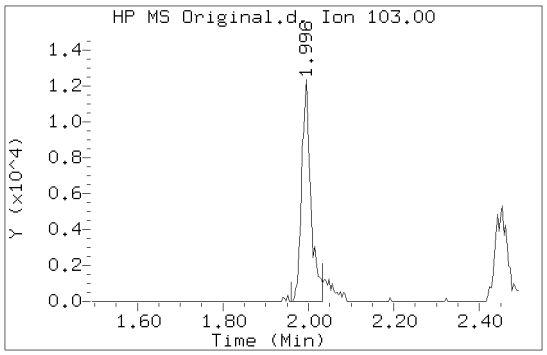
AFTER

MASS
101
AREA
26961
HEIGHT
17280
17-Nov-2022
14:02
linh
pham



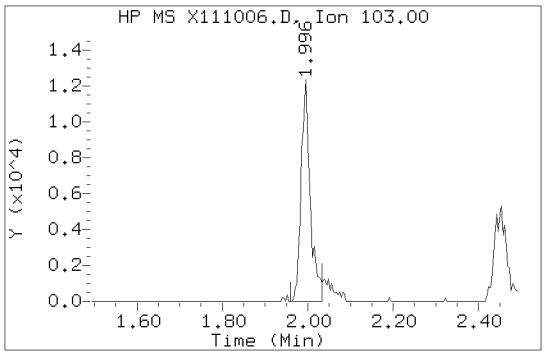
BEFORE

MASS
103
AREA
18886
HEIGHT
12338
17-Nov-2022
13:58
linh
pham



AFTER

MASS
103
AREA
18886
HEIGHT
12338
17-Nov-2022
14:02
linh
pham



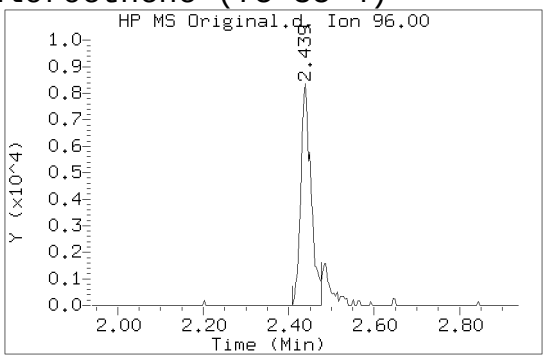
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

1,1-Dichloroethene (75-35-4)

Reason Code:

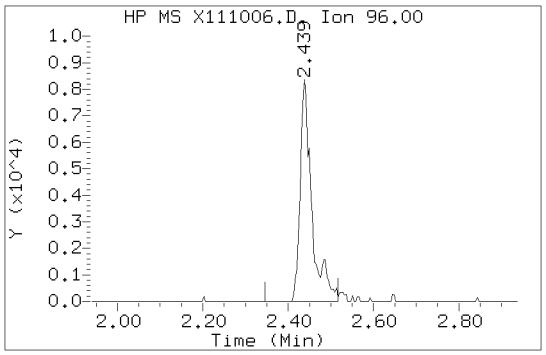
BEFORE

MASS
96
AREA
14278
HEIGHT
8360
17-Nov-2022
13:58
linh
pham



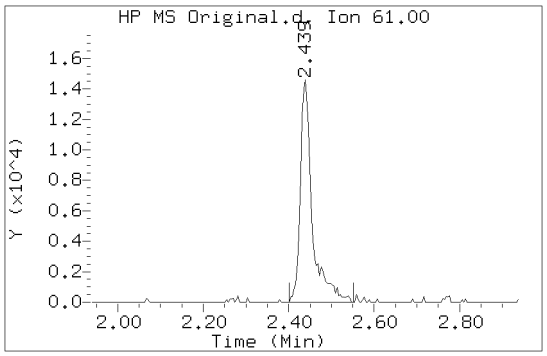
AFTER

MASS
96
AREA
16202
HEIGHT
8360
17-Nov-2022
14:02
linh
pham



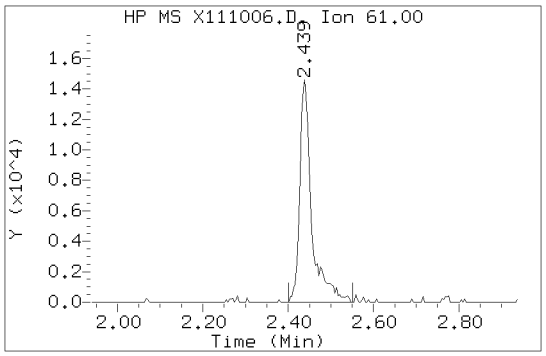
BEFORE

MASS
61
AREA
29211
HEIGHT
14598
17-Nov-2022
13:58
linh
pham



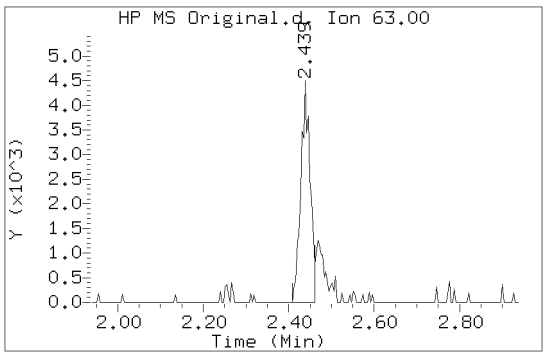
AFTER

MASS
61
AREA
29211
HEIGHT
14598
17-Nov-2022
14:02
linh
pham



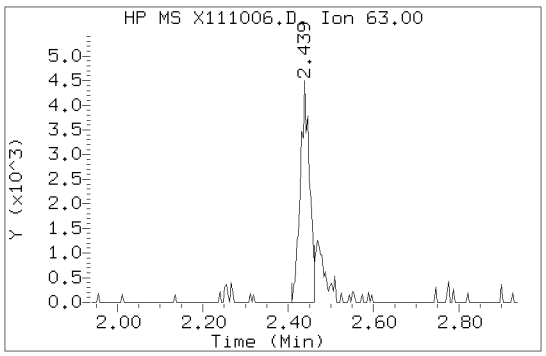
BEFORE

MASS
63
AREA
6980
HEIGHT
4500
17-Nov-2022
13:58
linh
pham



AFTER

MASS
63
AREA
6980
HEIGHT
4500
17-Nov-2022
14:02
linh
pham

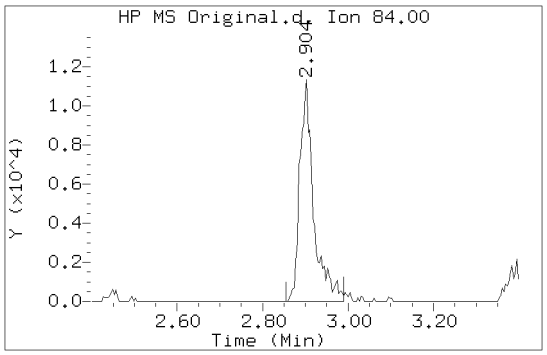


Methylene Chloride (75-09-2)

Reason Code:

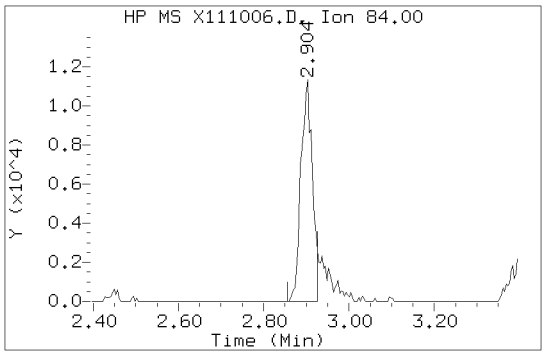
BEFORE

MASS
84
AREA
25990
HEIGHT
11345
17-Nov-2022
13:58
linh
pham



AFTER

MASS
84
AREA
21548
HEIGHT
11345
17-Nov-2022
14:02
linh
pham



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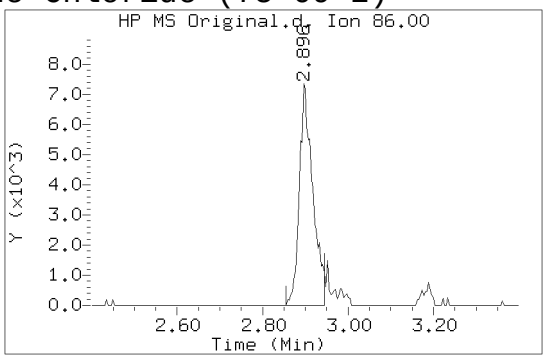
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

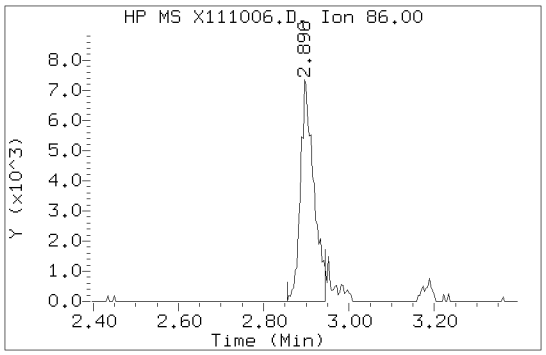
Methylene Chloride (75-09-2)

Reason Code:

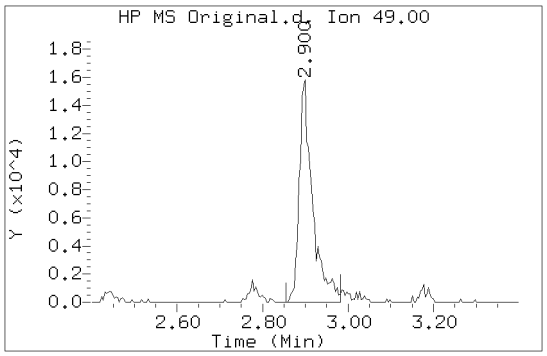
BEFORE
MASS
86
AREA
16304
HEIGHT
7354
17-Nov-2022
13:58
linh
pham



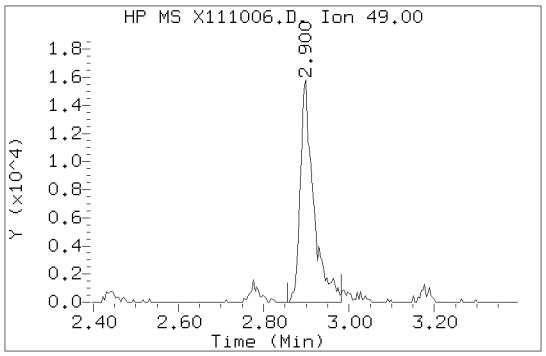
AFTER
MASS
86
AREA
16304
HEIGHT
7354
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
49
AREA
35009
HEIGHT
15813
17-Nov-2022
13:58
linh
pham



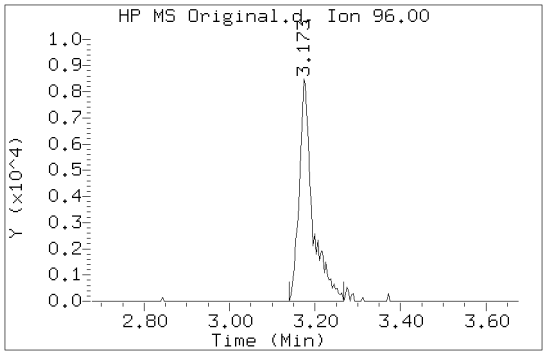
AFTER
MASS
49
AREA
35009
HEIGHT
15813
17-Nov-2022
14:02
linh
pham



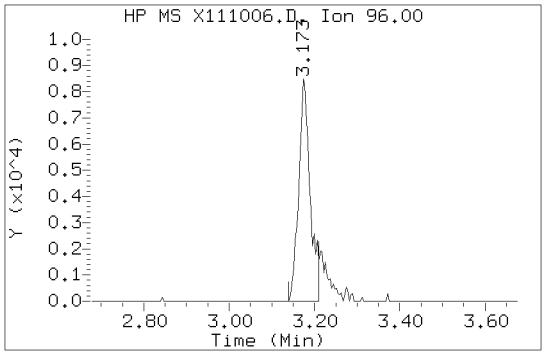
trans-1,2-Dichloroethene (156-60-5)

Reason Code:

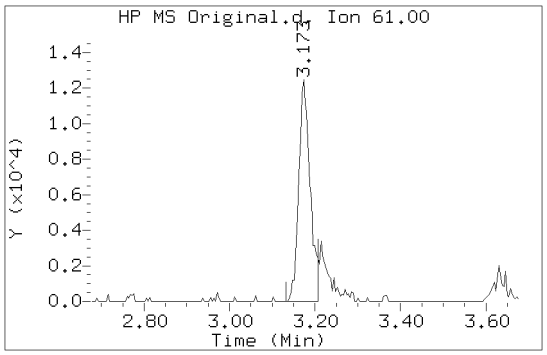
BEFORE
MASS
96
AREA
18893
HEIGHT
8488
17-Nov-2022
13:58
linh
pham



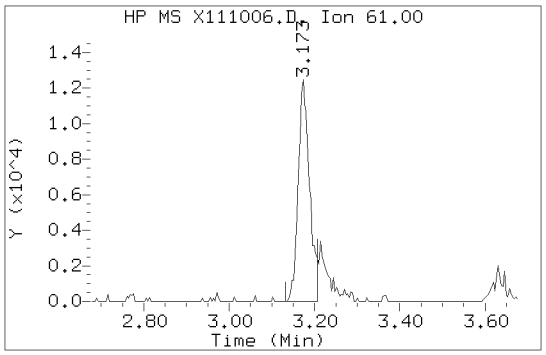
AFTER
MASS
96
AREA
16193
HEIGHT
8488
17-Nov-2022
14:02
linh
pham



BEFORE
MASS
61
AREA
23541
HEIGHT
12474
17-Nov-2022
13:58
linh
pham



AFTER
MASS
61
AREA
23541
HEIGHT
12474
17-Nov-2022
14:02
linh
pham



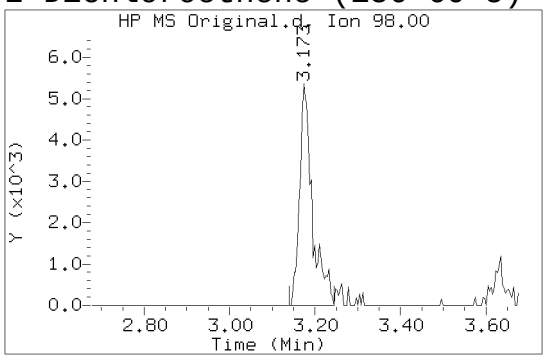
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111006.D
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

trans-1,2-Dichloroethene (156-60-5)

Reason Code:

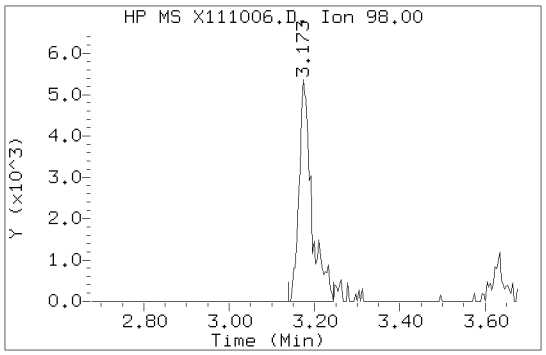
BEFORE

MASS
98
AREA
11270
HEIGHT
5363
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
11270
HEIGHT
5363
17-Nov-2022
14:02
linh
pham

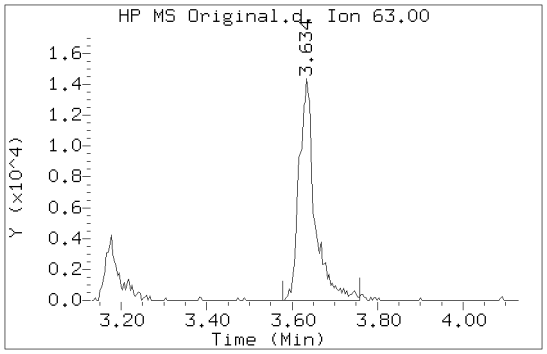


1,1-Dichloroethane (75-34-3)

Reason Code:

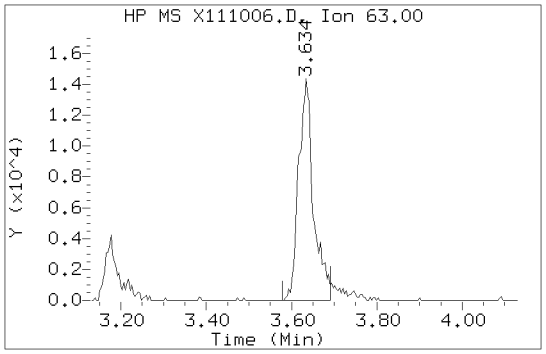
BEFORE

MASS
63
AREA
37389
HEIGHT
14372
17-Nov-2022
13:58
linh
pham



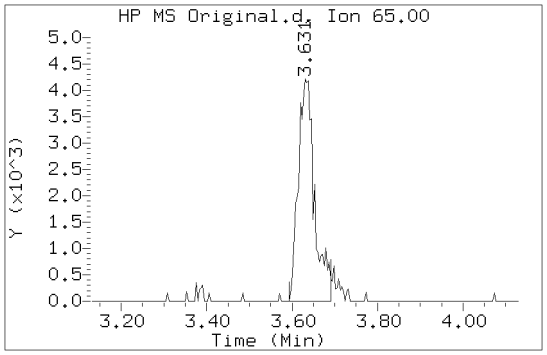
AFTER

MASS
63
AREA
35092
HEIGHT
14372
17-Nov-2022
14:02
linh
pham



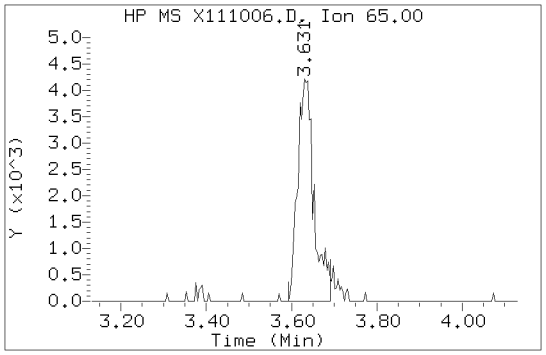
BEFORE

MASS
65
AREA
11296
HEIGHT
4215
17-Nov-2022
13:58
linh
pham



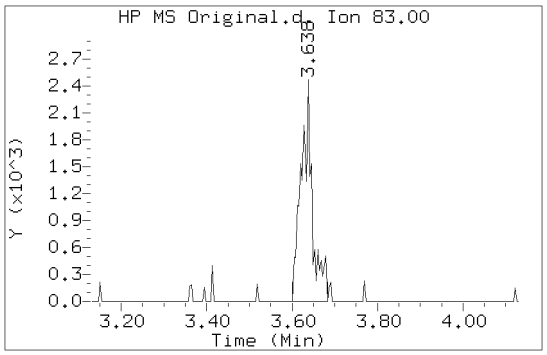
AFTER

MASS
65
AREA
11296
HEIGHT
4215
17-Nov-2022
14:02
linh
pham



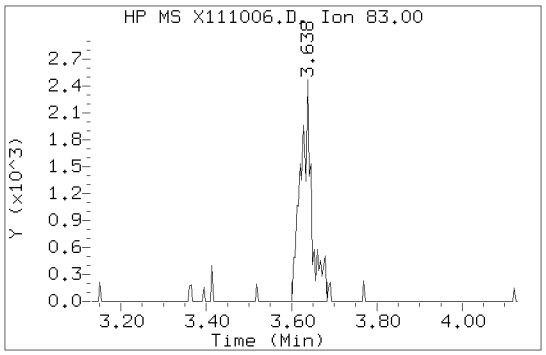
BEFORE

MASS
83
AREA
4533
HEIGHT
2468
17-Nov-2022
13:58
linh
pham



AFTER

MASS
83
AREA
4533
HEIGHT
2468
17-Nov-2022
14:02
linh
pham



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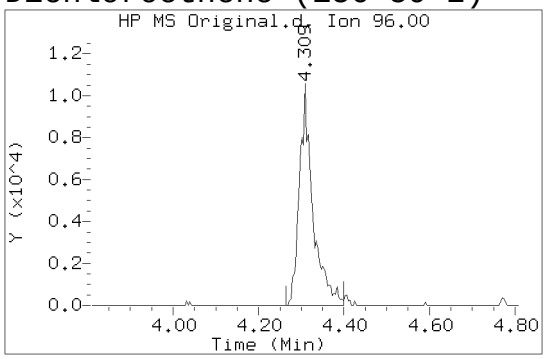
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

cis-1,2-Dichloroethene (156-59-2)

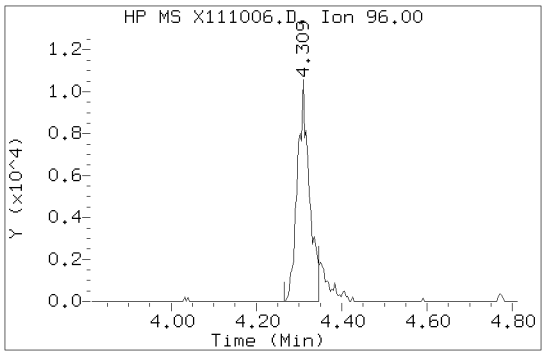
BEFORE

MASS
96
AREA
23499
HEIGHT
10573
17-Nov-2022
13:58
linh
pham



AFTER

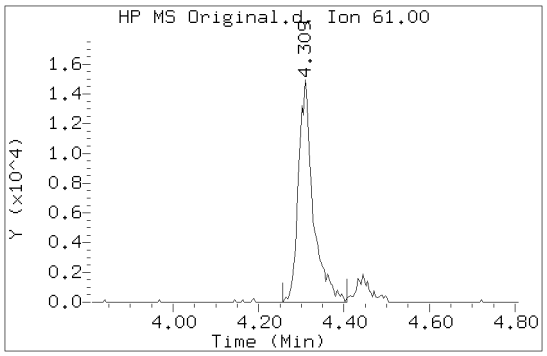
MASS
96
AREA
20918
HEIGHT
10573
17-Nov-2022
14:02
linh
pham



Reason Code:

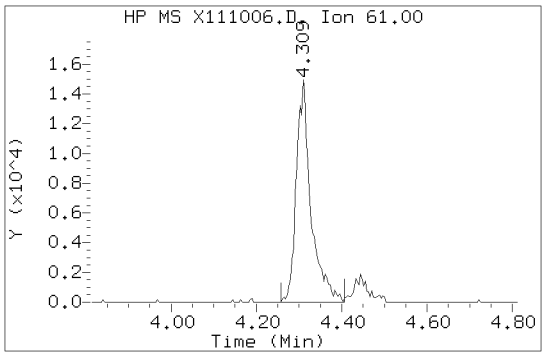
BEFORE

MASS
61
AREA
36252
HEIGHT
14941
17-Nov-2022
13:58
linh
pham



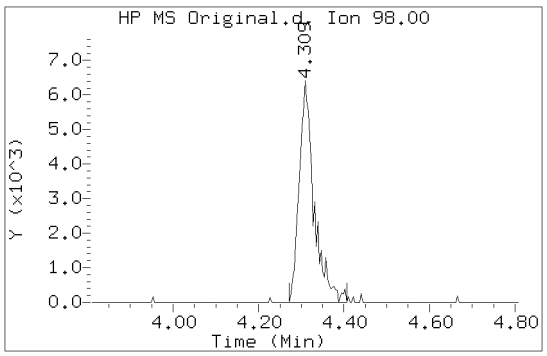
AFTER

MASS
61
AREA
36252
HEIGHT
14941
17-Nov-2022
14:02
linh
pham



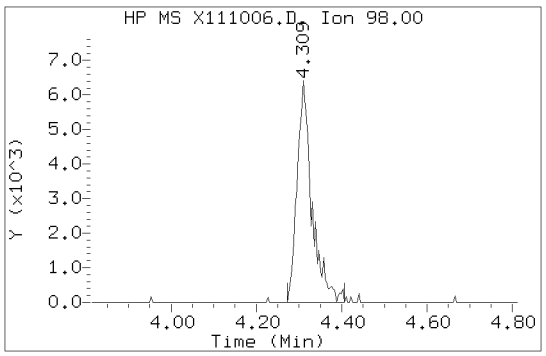
BEFORE

MASS
98
AREA
15710
HEIGHT
6412
17-Nov-2022
13:58
linh
pham



AFTER

MASS
98
AREA
15710
HEIGHT
6412
17-Nov-2022
14:02
linh
pham

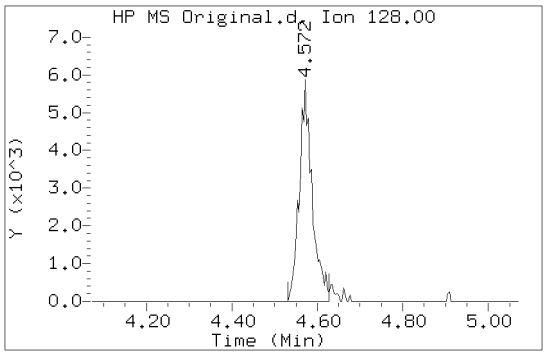


Bromochloromethane (74-97-5)

Reason Code:

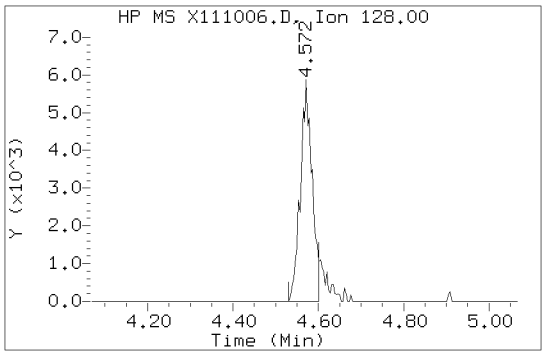
BEFORE

MASS
128
AREA
12367
HEIGHT
5873
17-Nov-2022
13:58
linh
pham



AFTER

MASS
128
AREA
11352
HEIGHT
5873
17-Nov-2022
14:02
linh
pham



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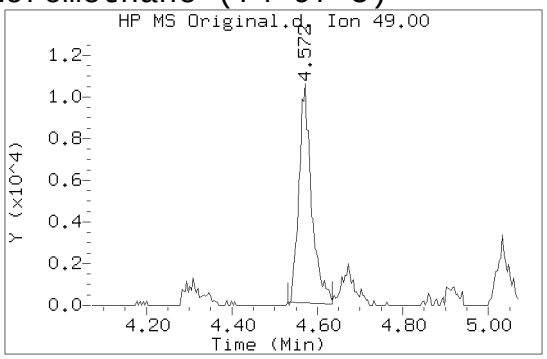
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Bromochloromethane (74-97-5)

Reason Code:

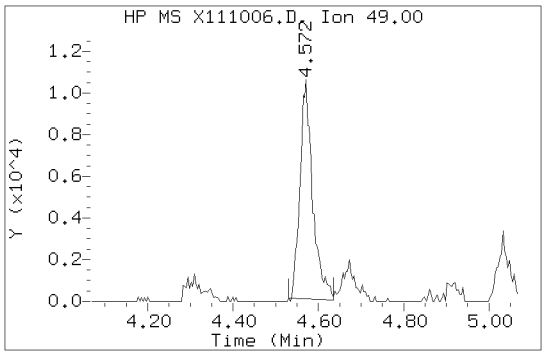
BEFORE

MASS
49
AREA
22007
HEIGHT
10520
17-Nov-2022
13:58
linh
pham



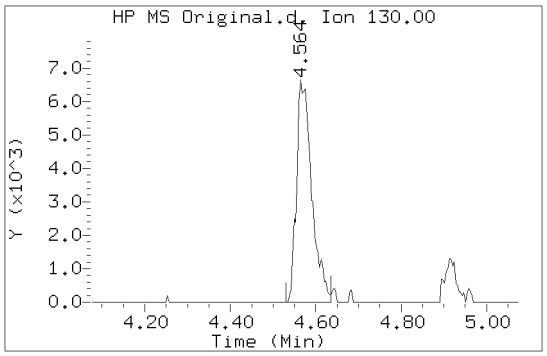
AFTER

MASS
49
AREA
22007
HEIGHT
10520
17-Nov-2022
14:02
linh
pham



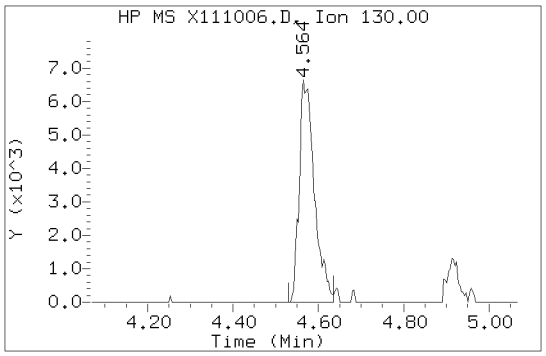
BEFORE

MASS
130
AREA
16667
HEIGHT
6646
17-Nov-2022
13:58
linh
pham



AFTER

MASS
130
AREA
16667
HEIGHT
6646
17-Nov-2022
14:02
linh
pham

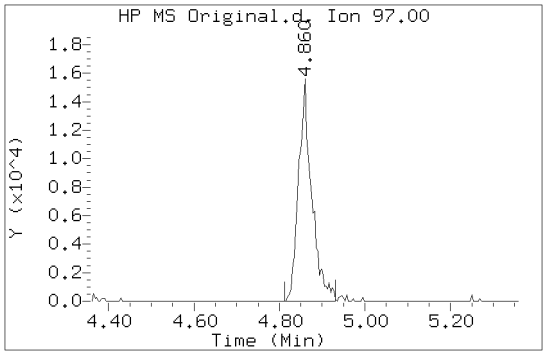


1,1,1-Trichloroethane (71-55-6)

Reason Code:

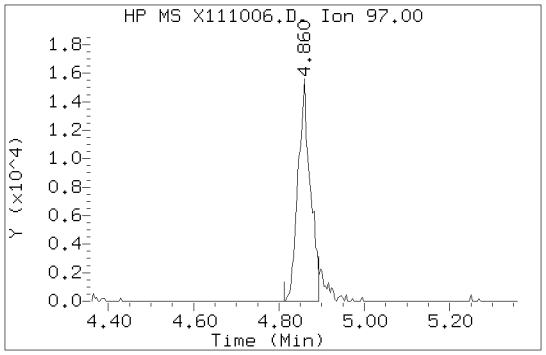
BEFORE

MASS
97
AREA
34152
HEIGHT
15600
17-Nov-2022
13:58
linh
pham



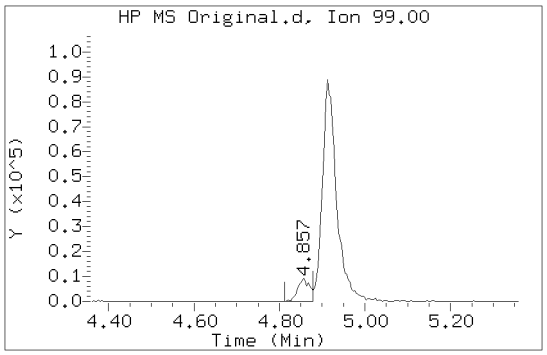
AFTER

MASS
97
AREA
31665
HEIGHT
15600
17-Nov-2022
14:02
linh
pham



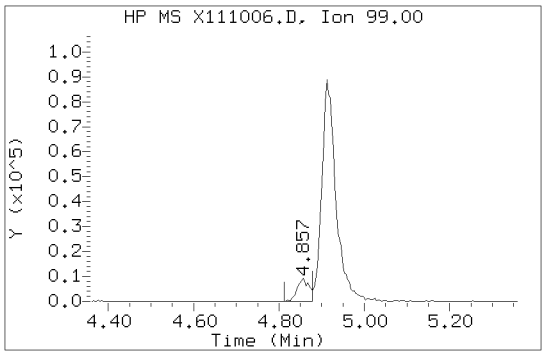
BEFORE

MASS
99
AREA
18296
HEIGHT
9274
17-Nov-2022
13:58
linh
pham



AFTER

MASS
99
AREA
18296
HEIGHT
9274
17-Nov-2022
14:02
linh
pham



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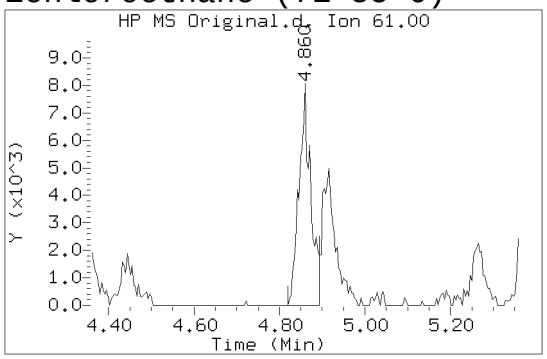
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

1,1,1-Trichloroethane (71-55-6)

Reason Code:

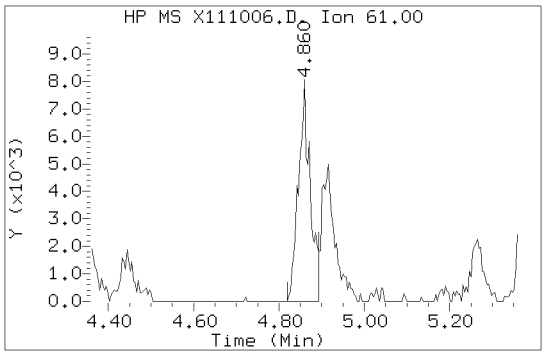
BEFORE

MASS
61
AREA
15687
HEIGHT
8064
17-Nov-2022
13:58
linh
pham



AFTER

MASS
61
AREA
15687
HEIGHT
8064
17-Nov-2022
14:02
linh
pham

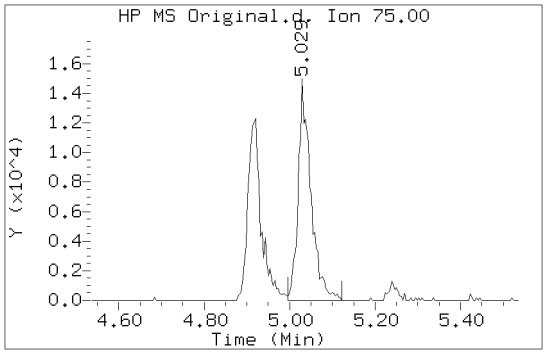


1,1-Dichloropropene (563-58-6)

Reason Code:

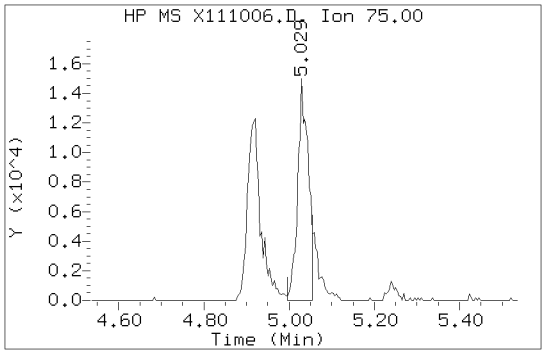
BEFORE

MASS
75
AREA
31172
HEIGHT
14990
17-Nov-2022
13:58
linh
pham



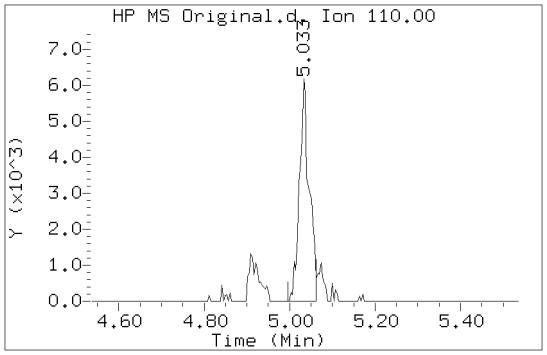
AFTER

MASS
75
AREA
26249
HEIGHT
14990
17-Nov-2022
14:02
linh
pham



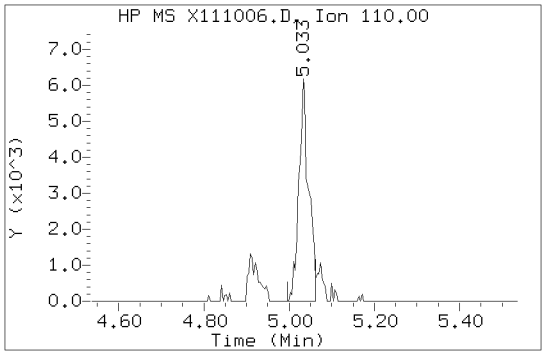
BEFORE

MASS
110
AREA
10027
HEIGHT
6174
17-Nov-2022
13:58
linh
pham



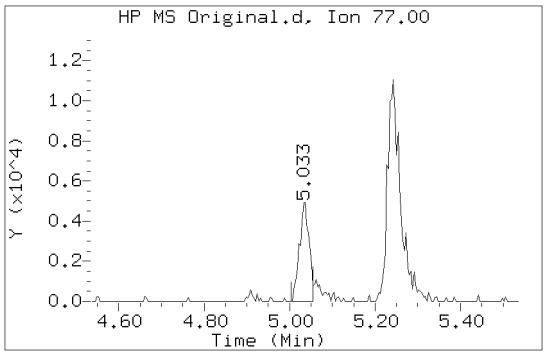
AFTER

MASS
110
AREA
10027
HEIGHT
6174
17-Nov-2022
14:02
linh
pham



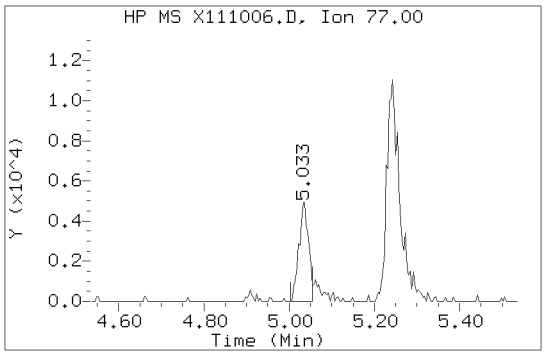
BEFORE

MASS
77
AREA
8004
HEIGHT
4934
17-Nov-2022
13:58
linh
pham



AFTER

MASS
77
AREA
8004
HEIGHT
4934
17-Nov-2022
14:02
linh
pham



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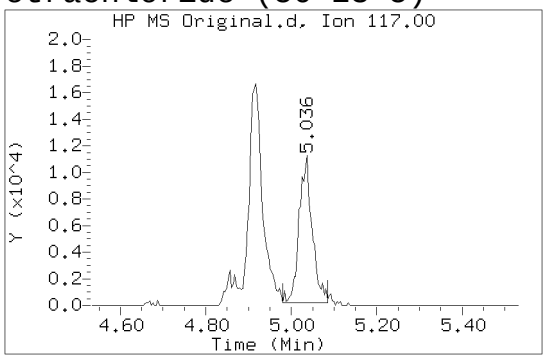
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Carbon Tetrachloride (56-23-5)

Reason Code:

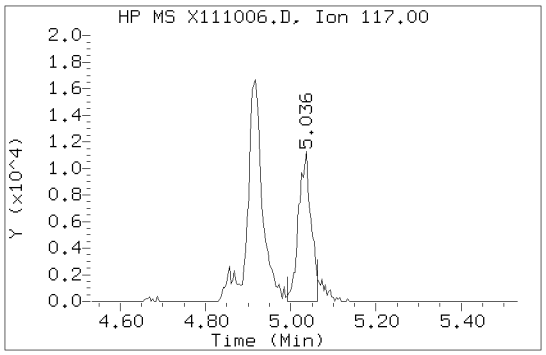
BEFORE

MASS
117
AREA
23854
HEIGHT
11116
17-Nov-2022
13:58
linh
pham



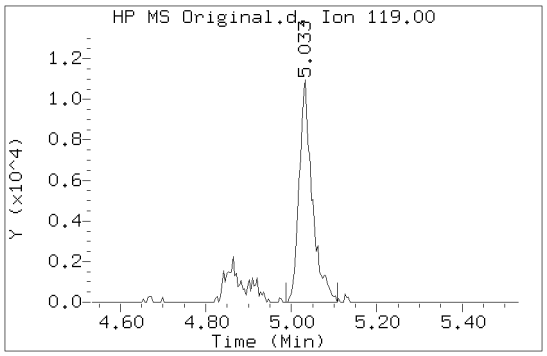
AFTER

MASS
117
AREA
23109
HEIGHT
11291
17-Nov-2022
14:02
linh
pham



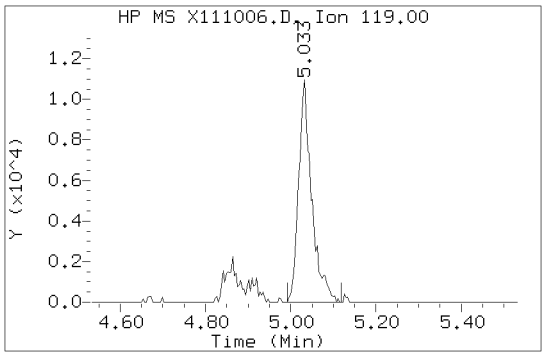
BEFORE

MASS
119
AREA
23539
HEIGHT
10955
17-Nov-2022
13:58
linh
pham



AFTER

MASS
119
AREA
23582
HEIGHT
10955
17-Nov-2022
14:02
linh
pham

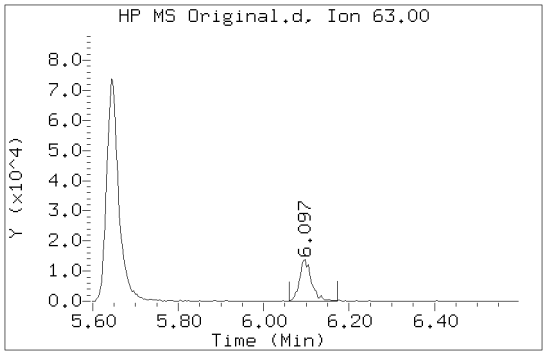


1,2-Dichloropropane (78-87-5)

Reason Code:

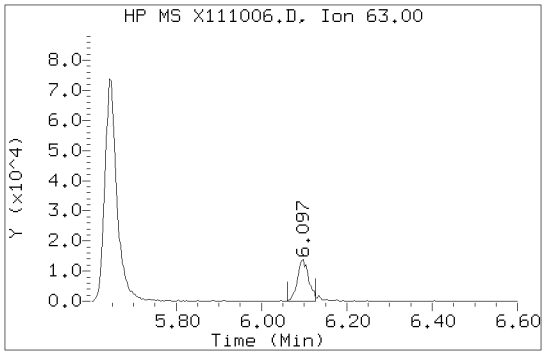
BEFORE

MASS
63
AREA
27453
HEIGHT
13828
17-Nov-2022
13:58
linh
pham



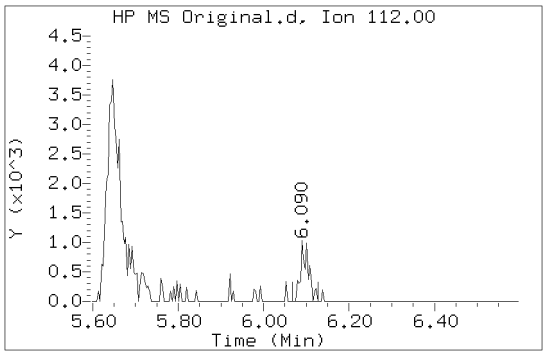
AFTER

MASS
63
AREA
25801
HEIGHT
13828
17-Nov-2022
14:02
linh
pham



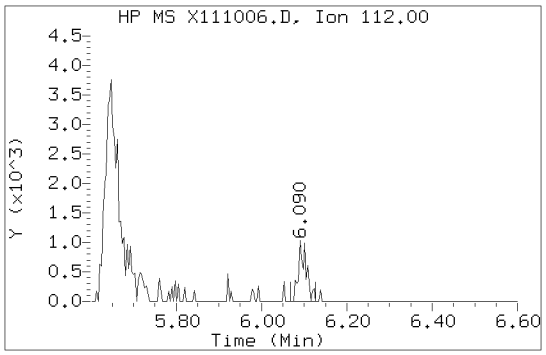
BEFORE

MASS
112
AREA
1345
HEIGHT
1034
17-Nov-2022
13:58
linh
pham



AFTER

MASS
112
AREA
1345
HEIGHT
1034
17-Nov-2022
14:02
linh
pham



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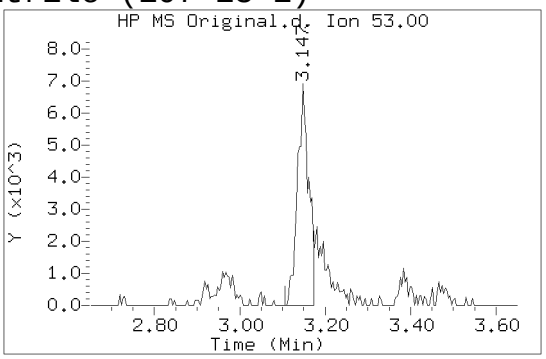
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Acrylonitrile (107-13-1)

Reason Code:

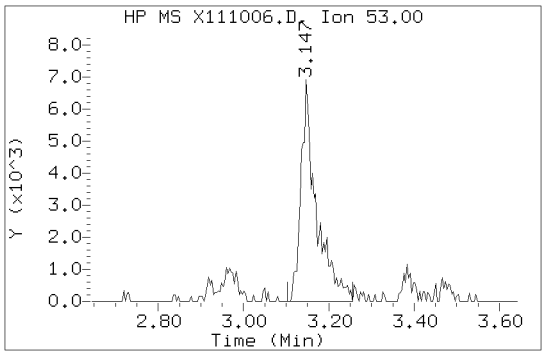
BEFORE

MASS
53
AREA
12750
HEIGHT
6916
17-Nov-2022
13:58
linh
pham



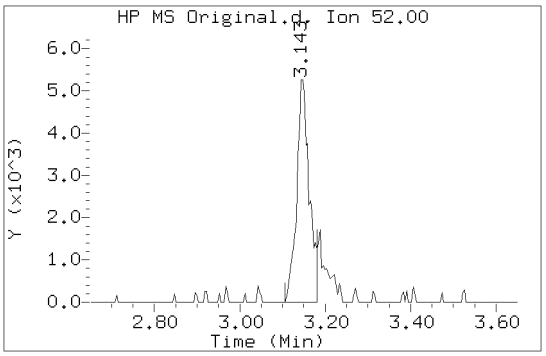
AFTER

MASS
53
AREA
17495
HEIGHT
6916
17-Nov-2022
14:02
linh
pham



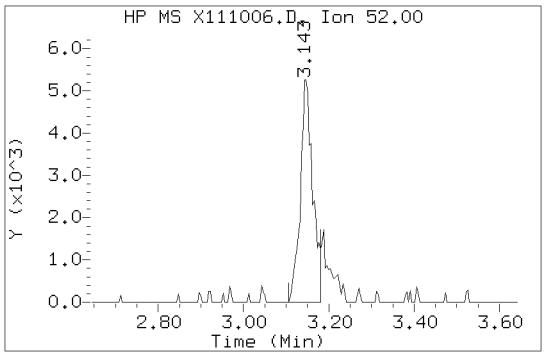
BEFORE

MASS
52
AREA
10880
HEIGHT
5258
17-Nov-2022
13:58
linh
pham



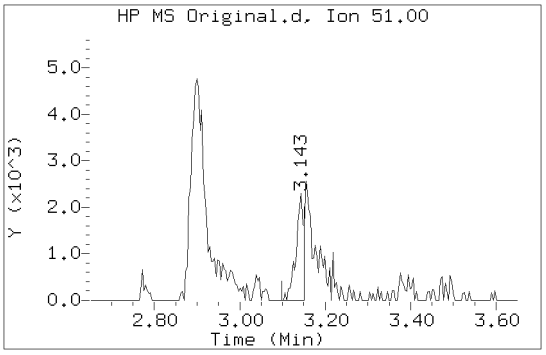
AFTER

MASS
52
AREA
10880
HEIGHT
5258
17-Nov-2022
14:02
linh
pham



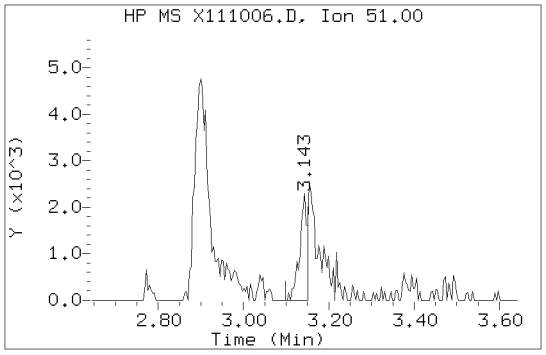
BEFORE

MASS
51
AREA
2880
HEIGHT
2298
17-Nov-2022
13:58
linh
pham



AFTER

MASS
51
AREA
2880
HEIGHT
2298
17-Nov-2022
14:02
linh
pham

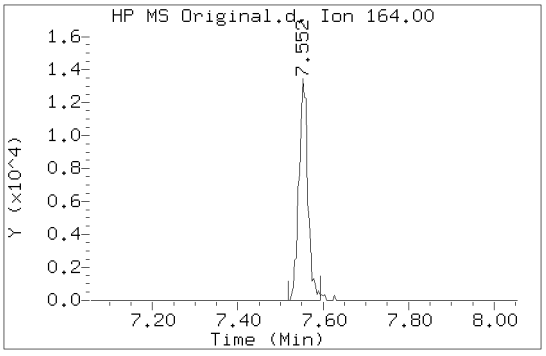


Tetrachloroethene (127-18-4)

Reason Code:

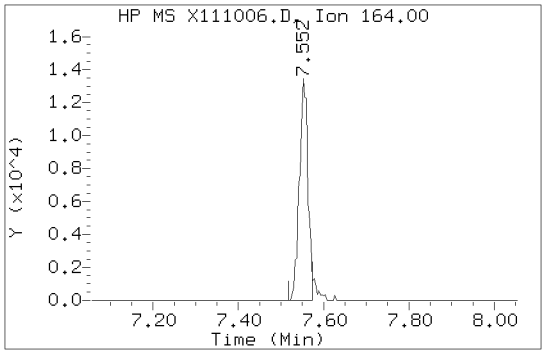
BEFORE

MASS
164
AREA
19902
HEIGHT
13448
17-Nov-2022
13:58
linh
pham



AFTER

MASS
164
AREA
19101
HEIGHT
13448
17-Nov-2022
14:02
linh
pham



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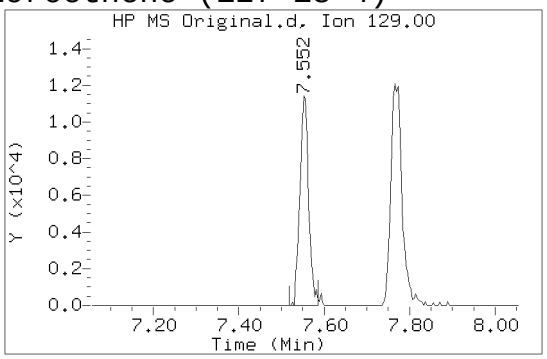
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Tetrachloroethene (127-18-4)

Reason Code:

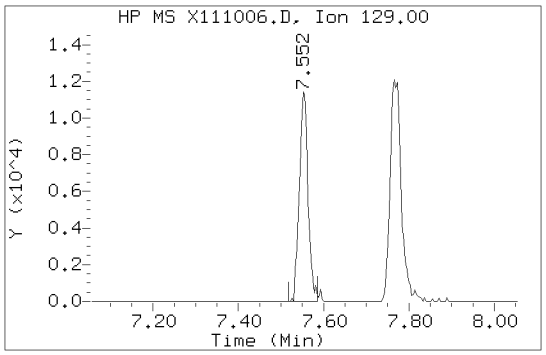
BEFORE

MASS
129
AREA
16528
HEIGHT
11422
17-Nov-2022
13:58
linh
pham



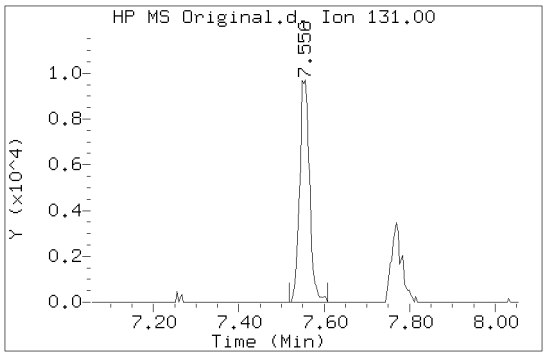
AFTER

MASS
129
AREA
16528
HEIGHT
11422
17-Nov-2022
14:02
linh
pham



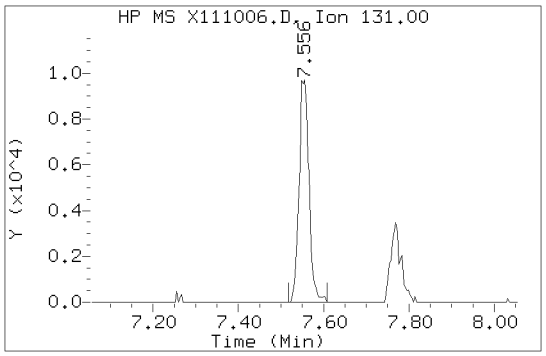
BEFORE

MASS
131
AREA
16023
HEIGHT
9709
17-Nov-2022
13:58
linh
pham



AFTER

MASS
131
AREA
16023
HEIGHT
9709
17-Nov-2022
14:02
linh
pham

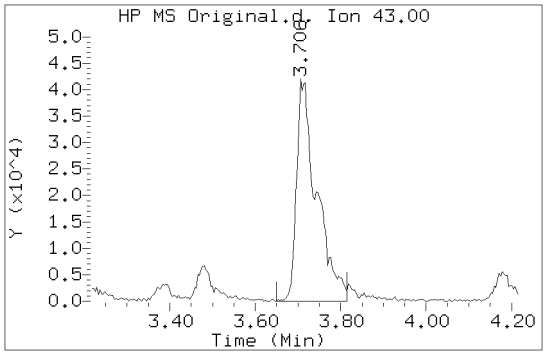


Vinyl Acetate (108-05-4)

Reason Code:

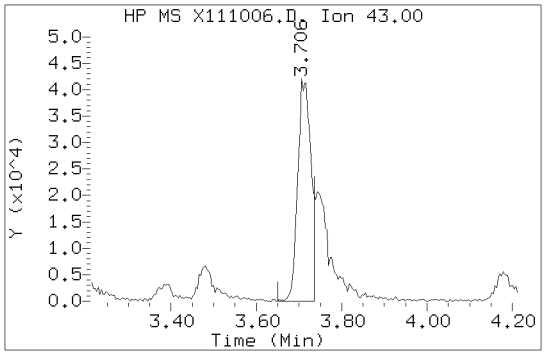
BEFORE

MASS
43
AREA
138604
HEIGHT
42024
17-Nov-2022
13:58
linh
pham



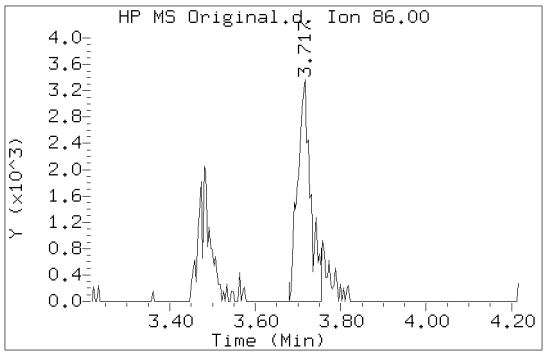
AFTER

MASS
43
AREA
91606
HEIGHT
42024
17-Nov-2022
14:02
linh
pham



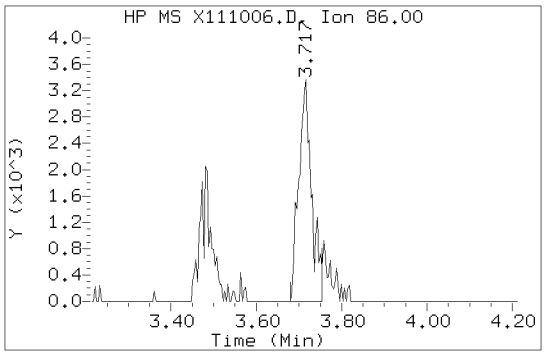
BEFORE

MASS
86
AREA
7221
HEIGHT
3367
17-Nov-2022
13:58
linh
pham



AFTER

MASS
86
AREA
7221
HEIGHT
3367
17-Nov-2022
14:02
linh
pham



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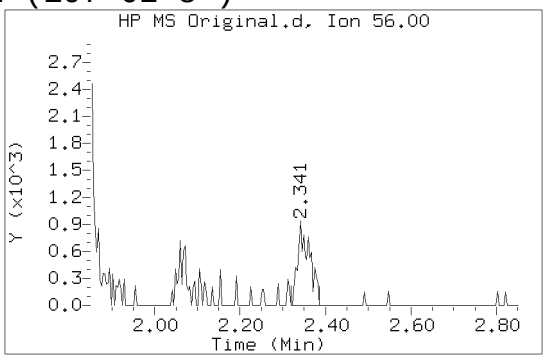
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Acrolein (107-02-8)

Reason Code:

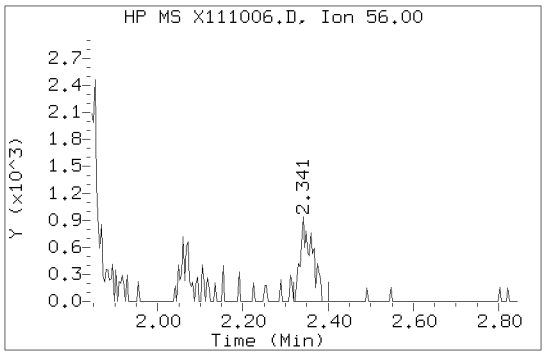
BEFORE

MASS
56
AREA
1818
HEIGHT
942
17-Nov-2022
13:58
linh
pham



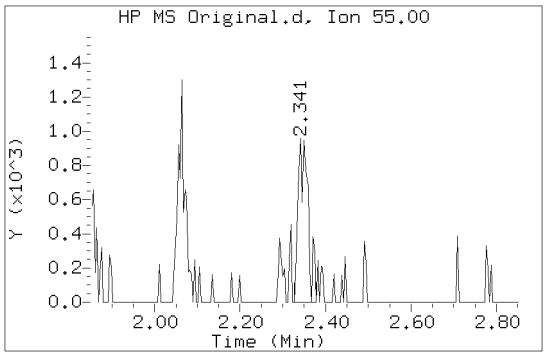
AFTER

MASS
56
AREA
1818
HEIGHT
942
17-Nov-2022
14:02
linh
pham



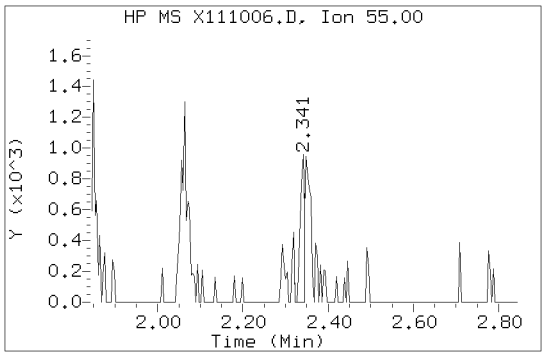
BEFORE

MASS
55
AREA
1589
HEIGHT
959
17-Nov-2022
13:58
linh
pham



AFTER

MASS
55
AREA
677
HEIGHT
959
17-Nov-2022
14:02
linh
pham

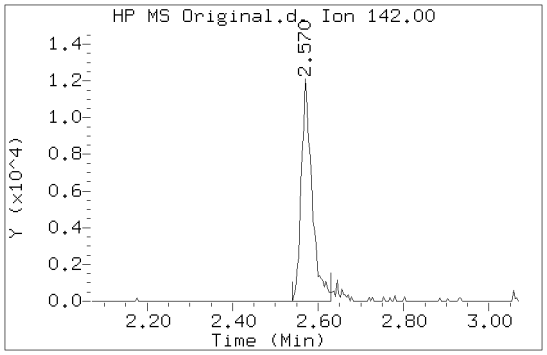


Iodomethane (74-88-4)

Reason Code:

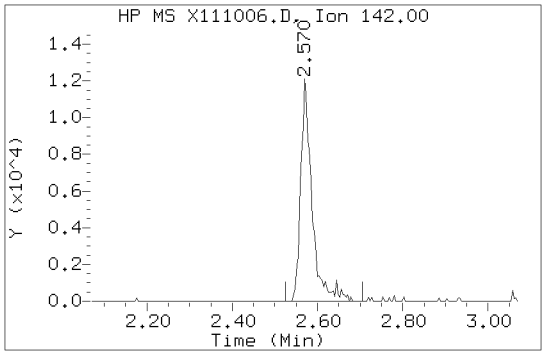
BEFORE

MASS
142
AREA
21622
HEIGHT
12107
17-Nov-2022
13:58
linh
pham



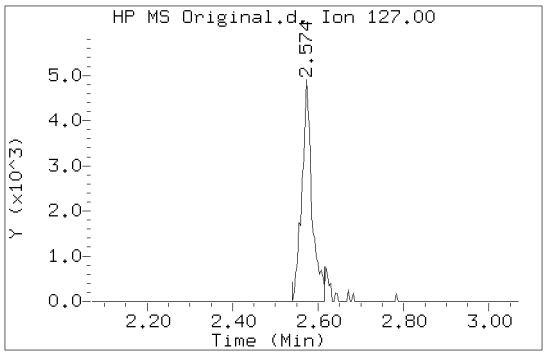
AFTER

MASS
142
AREA
22802
HEIGHT
12107
17-Nov-2022
14:02
linh
pham



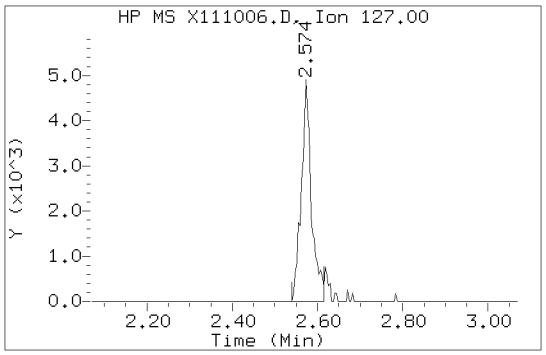
BEFORE

MASS
127
AREA
8239
HEIGHT
4908
17-Nov-2022
13:58
linh
pham



AFTER

MASS
127
AREA
8239
HEIGHT
4908
17-Nov-2022
14:02
linh
pham



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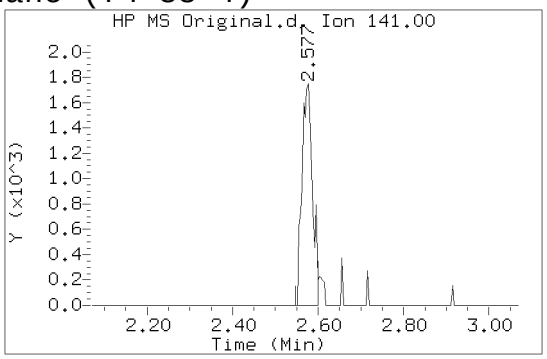
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Iodomethane (74-88-4)

Reason Code:

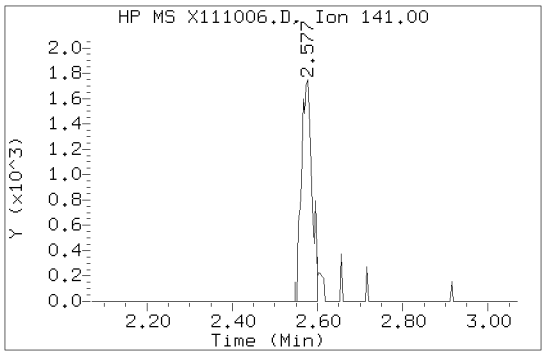
BEFORE

MASS
141
AREA
3057
HEIGHT
1749
17-Nov-2022
13:58
linh
pham



AFTER

MASS
141
AREA
3057
HEIGHT
1749
17-Nov-2022
14:02
linh
pham

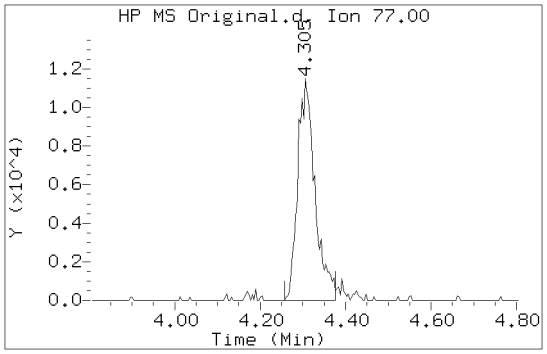


2,2-Dichloropropane (594-20-7)

Reason Code:

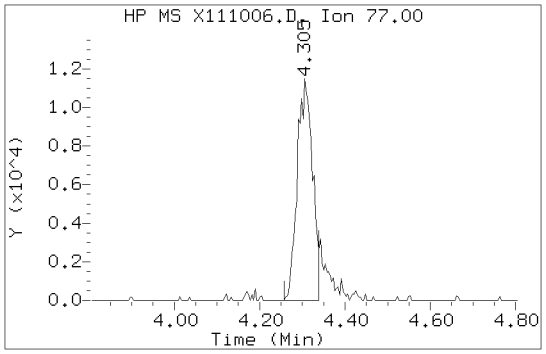
BEFORE

MASS
77
AREA
32570
HEIGHT
11490
17-Nov-2022
13:58
linh
pham



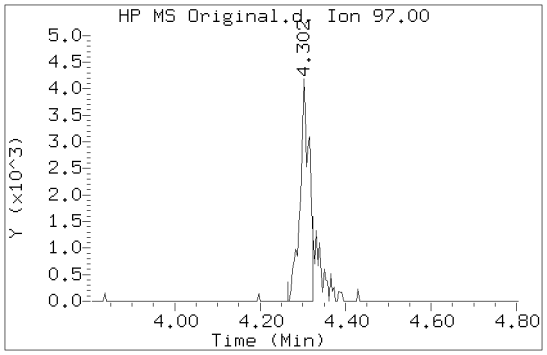
AFTER

MASS
77
AREA
29105
HEIGHT
11490
17-Nov-2022
14:02
linh
pham



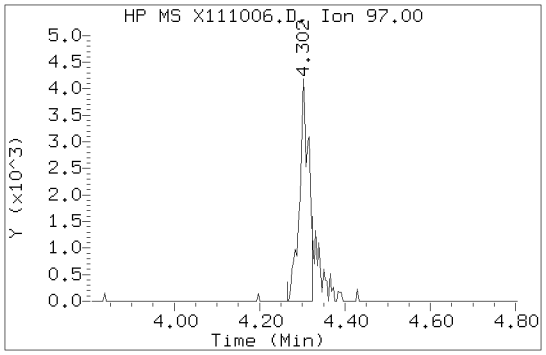
BEFORE

MASS
97
AREA
6528
HEIGHT
4184
17-Nov-2022
13:58
linh
pham



AFTER

MASS
97
AREA
6528
HEIGHT
4184
17-Nov-2022
14:02
linh
pham

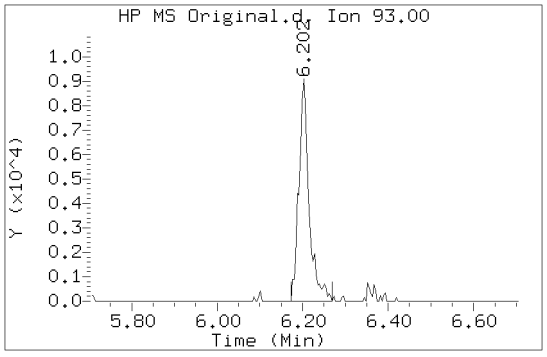


Dibromomethane (74-95-3)

Reason Code:

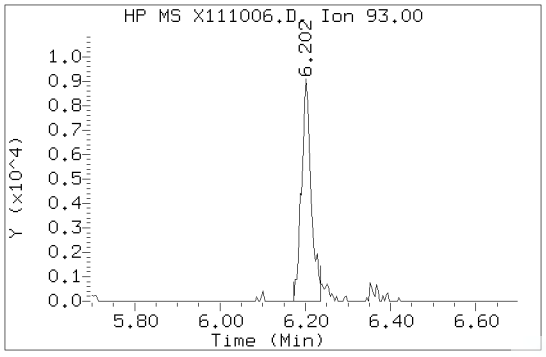
BEFORE

MASS
93
AREA
15468
HEIGHT
9094
17-Nov-2022
13:58
linh
pham



AFTER

MASS
93
AREA
14628
HEIGHT
9094
17-Nov-2022
14:02
linh
pham



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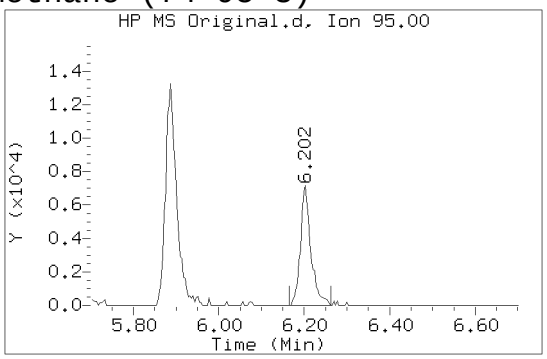
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Dibromomethane (74-95-3)

Reason Code:

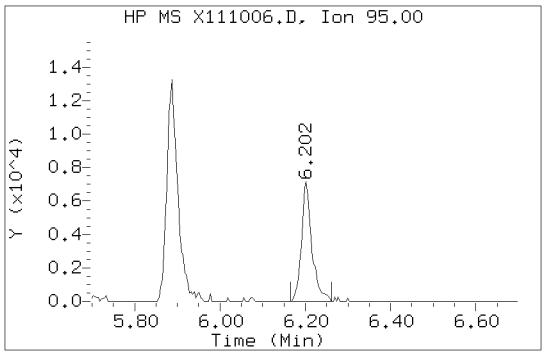
BEFORE

MASS
95
AREA
12446
HEIGHT
7150
17-Nov-2022
13:58
linh
pham



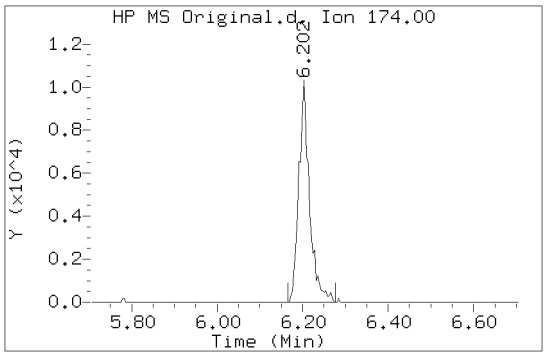
AFTER

MASS
95
AREA
12446
HEIGHT
7150
17-Nov-2022
14:02
linh
pham



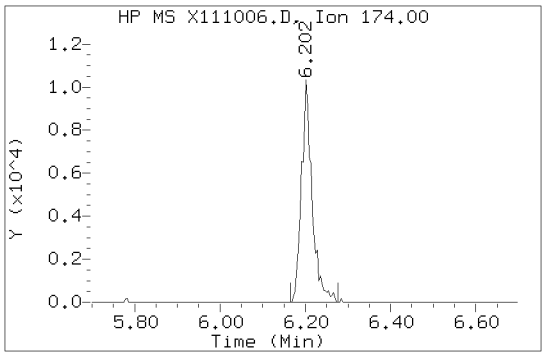
BEFORE

MASS
174
AREA
18296
HEIGHT
10340
17-Nov-2022
13:58
linh
pham



AFTER

MASS
174
AREA
18296
HEIGHT
10340
17-Nov-2022
14:02
linh
pham

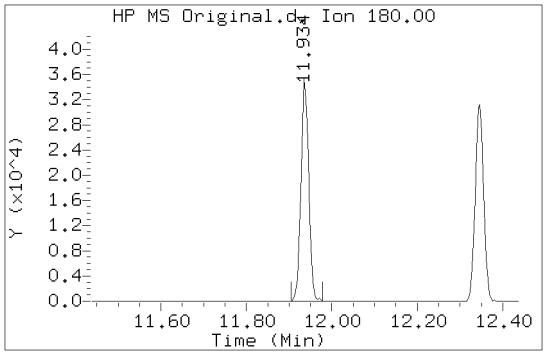


1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

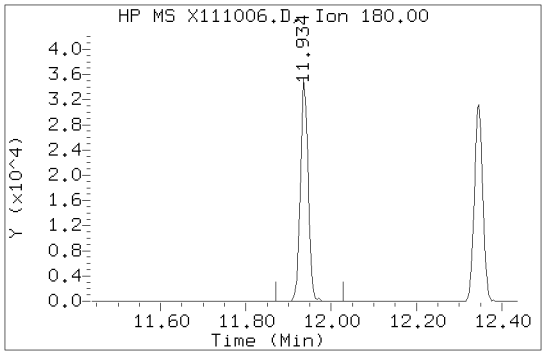
BEFORE

MASS
180
AREA
45747
HEIGHT
35288
17-Nov-2022
13:58
linh
pham



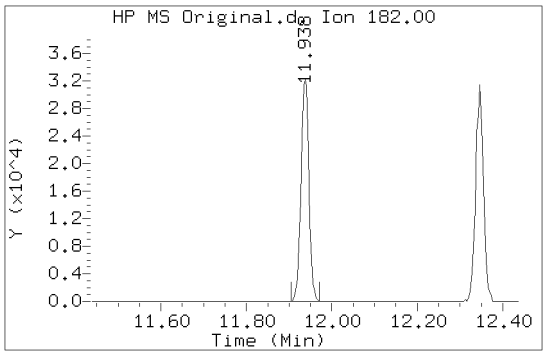
AFTER

MASS
180
AREA
45748
HEIGHT
35288
17-Nov-2022
14:02
linh
pham



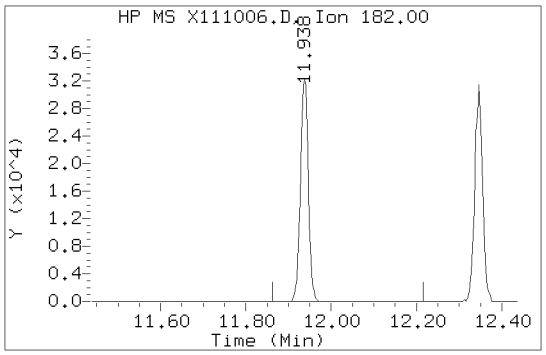
BEFORE

MASS
182
AREA
42977
HEIGHT
32192
17-Nov-2022
13:58
linh
pham



AFTER

MASS
182
AREA
42982
HEIGHT
32192
17-Nov-2022
14:02
linh
pham



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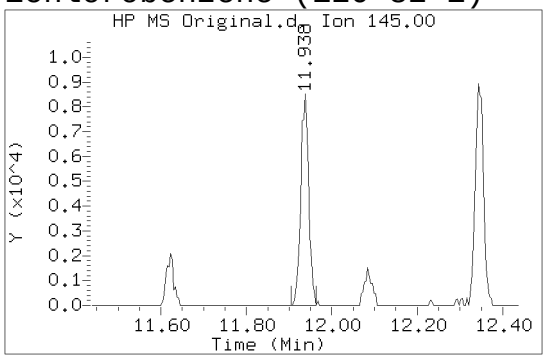
Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

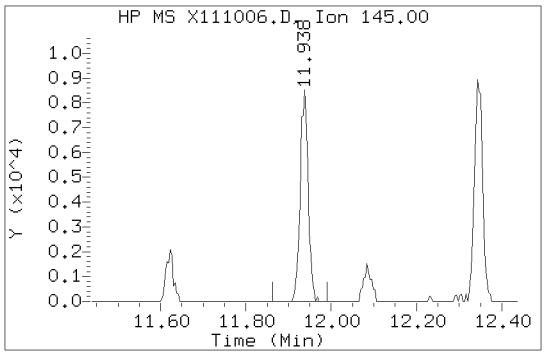
BEFORE

MASS
145
AREA
11369
HEIGHT
8522
17-Nov-2022
13:58
linh
pham



AFTER

MASS
145
AREA
11406
HEIGHT
8522
17-Nov-2022
14:02
linh
pham

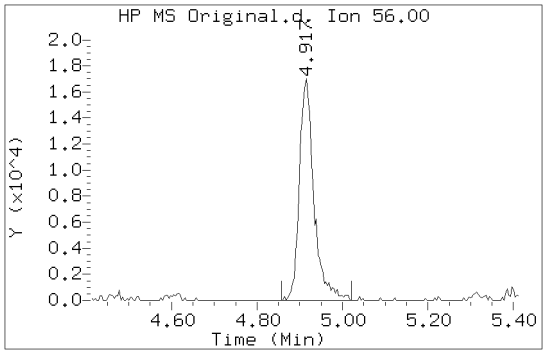


Cyclohexane (110-82-7)

Reason Code:

BEFORE

MASS
56
AREA
41007
HEIGHT
17016
17-Nov-2022
13:58
linh
pham



AFTER

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17-Nov-2022
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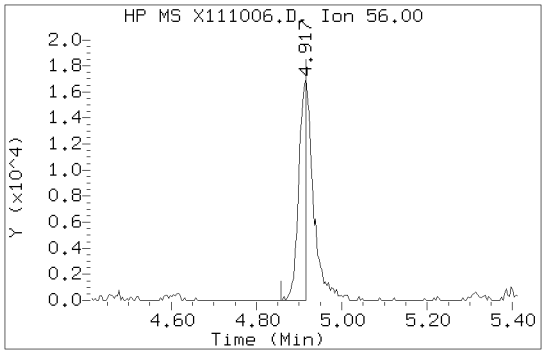

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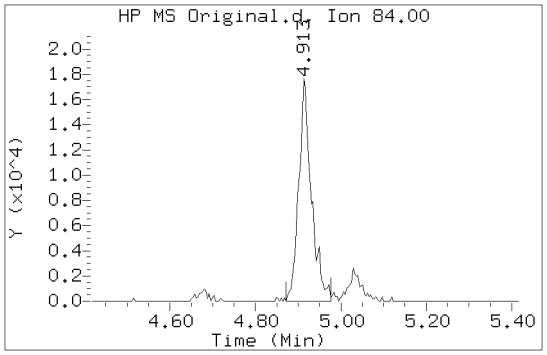

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17-Nov-2022
14:02
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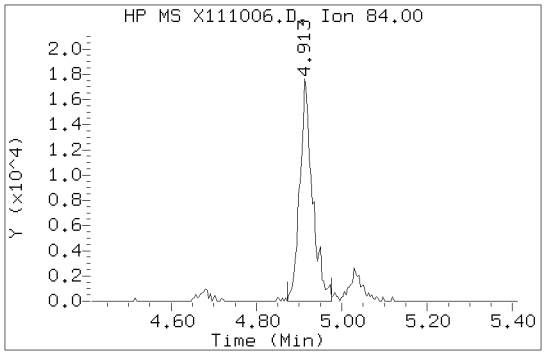

BEFORE

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17-Nov-2022
13:58
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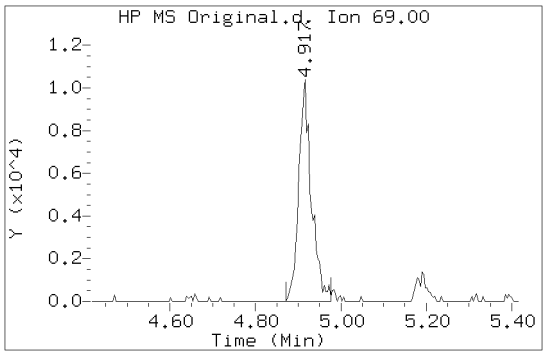

AFTER

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17-Nov-2022
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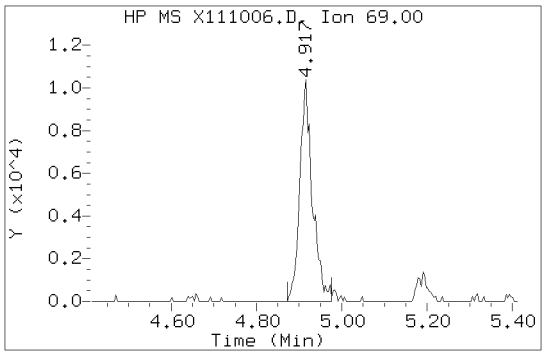

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Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Freon TF (76-13-1)

Reason Code:

BEFORE

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8136
17-Nov-2022
13:58
linh
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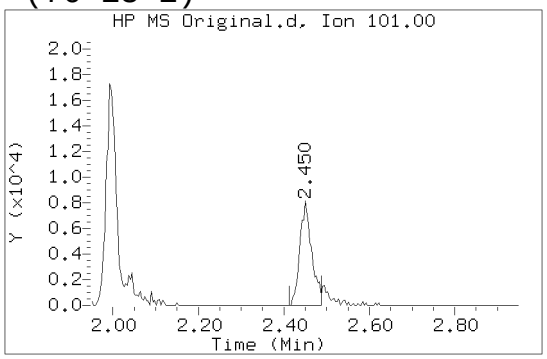

AFTER

MASS
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17-Nov-2022
14:02
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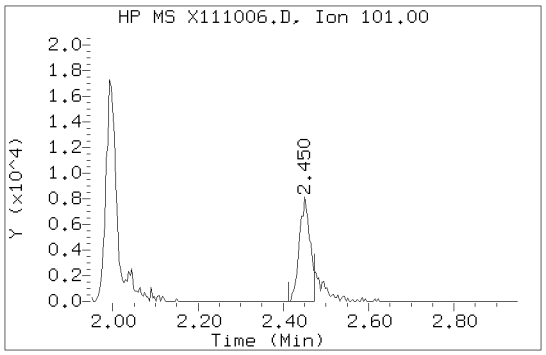

BEFORE

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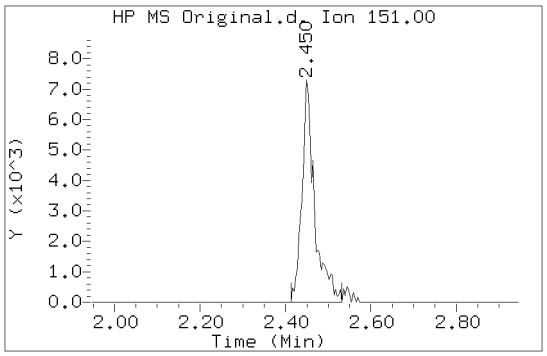

AFTER

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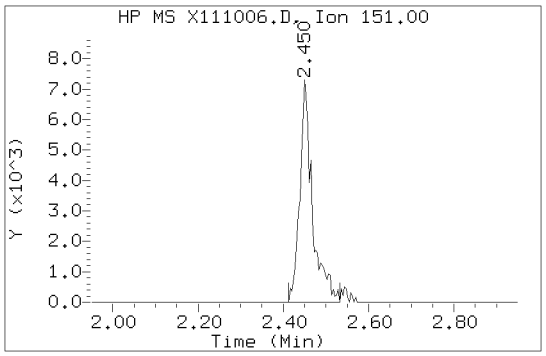

Methyl Acetate (79-20-9)

Reason Code:

BEFORE

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9380
17-Nov-2022
13:58
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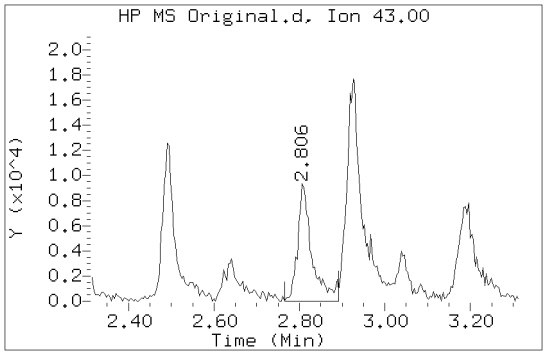
pham



AFTER

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AREA
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14:02
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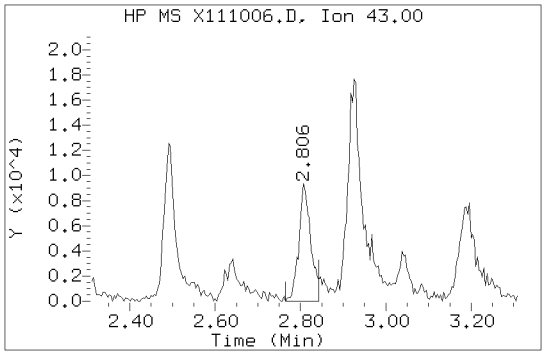

BEFORE

MASS
74
AREA
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1825
17-Nov-2022
13:58
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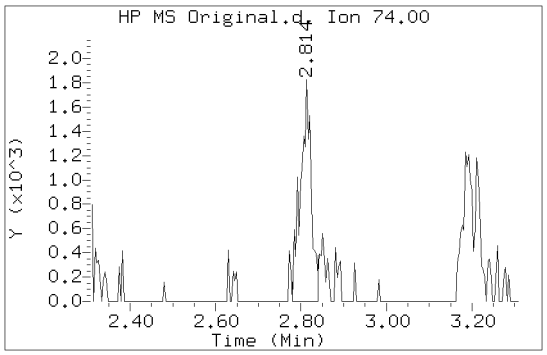

AFTER

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74
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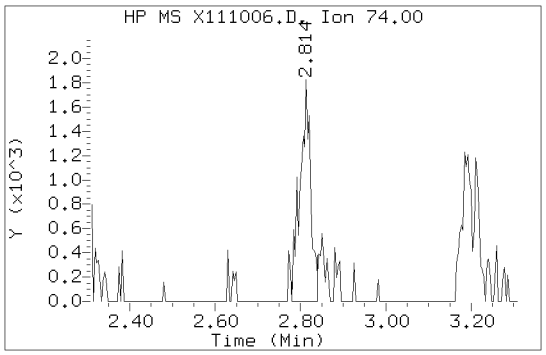

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Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

MASS
113
AREA
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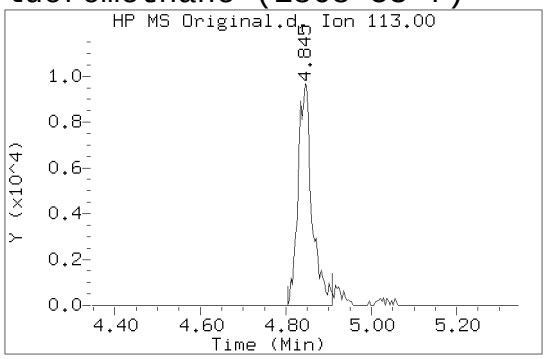
HEIGHT
9679
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
20848
HEIGHT
9679
17-Nov-2022
14:02
linh
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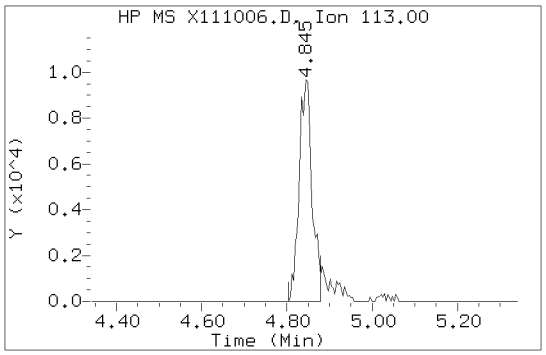

BEFORE

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11234
17-Nov-2022
13:58
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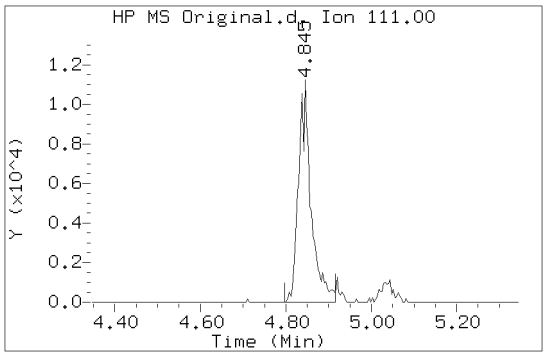

AFTER

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111
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14:02
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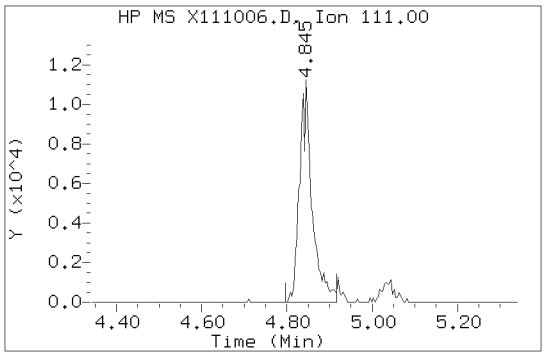

1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

BEFORE

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17-Nov-2022
13:58
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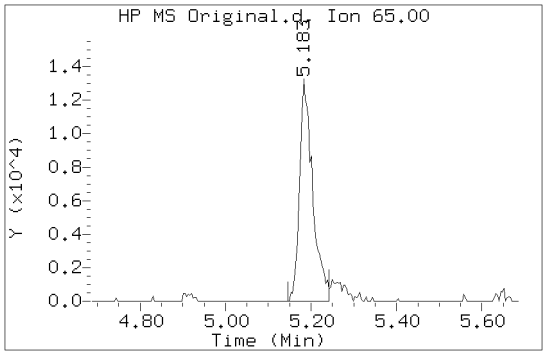

AFTER

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17-Nov-2022
14:02
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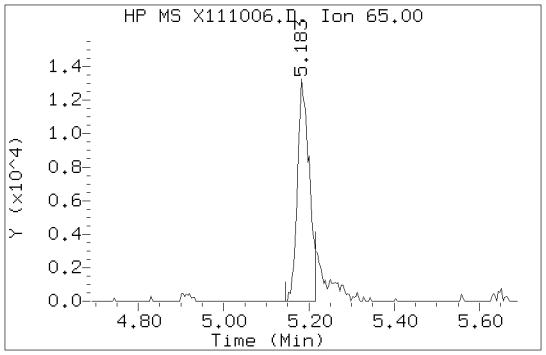

BEFORE

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2719
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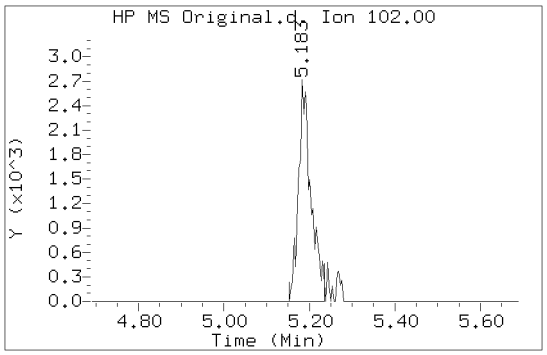

AFTER

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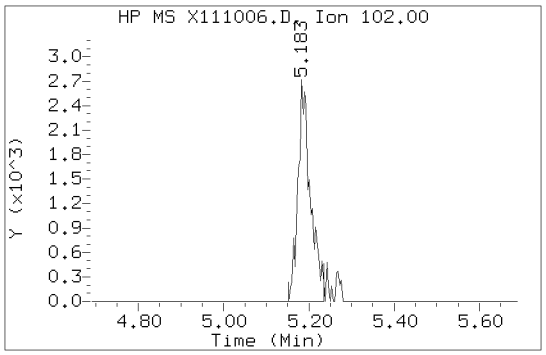

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Inj Date : 10-NOV-2022 14:56
InstruID : voa10.i
LabSampID : VSTD005

4-Bromofluorobenzene (460-00-4)

Reason Code:

BEFORE

MASS
95
AREA
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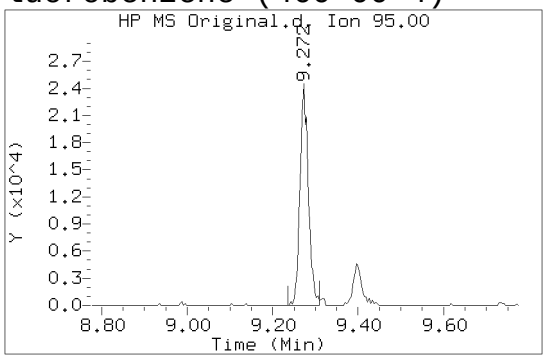
HEIGHT
24520
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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17-Nov-2022
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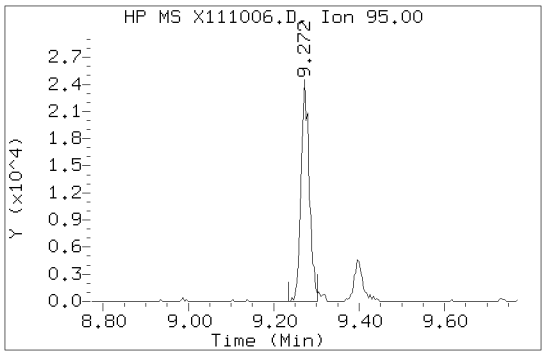

BEFORE

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17-Nov-2022
13:58
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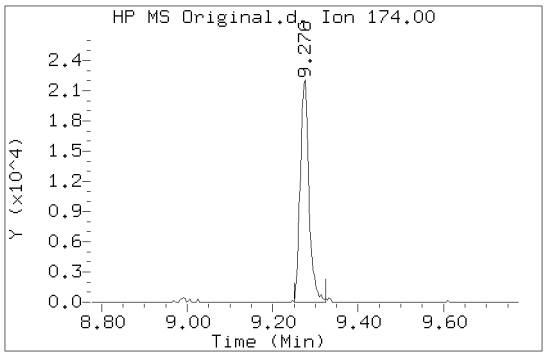

AFTER

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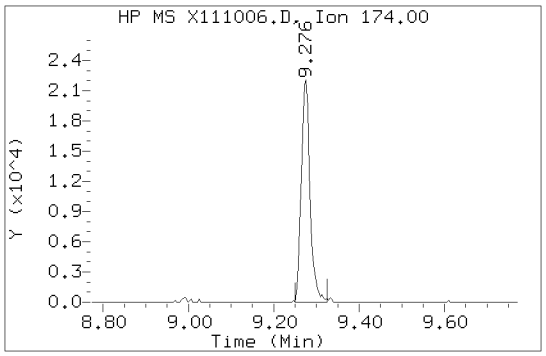

BEFORE

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HEIGHT
21816
17-Nov-2022
13:58
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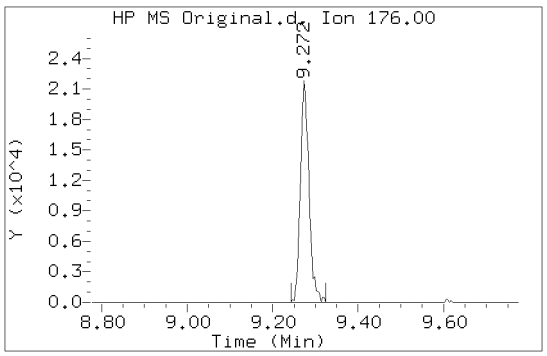

AFTER

MASS
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HEIGHT
21816
17-Nov-2022
14:02
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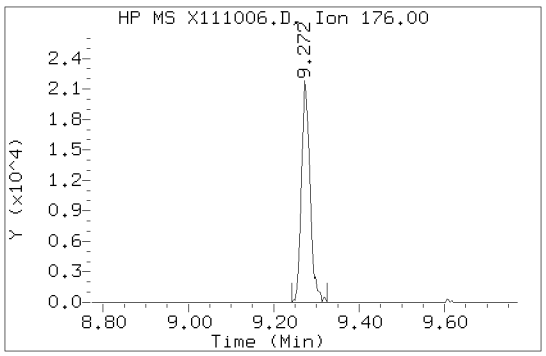


Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111007.D Page 1
Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111007.D
Lab Smp Id: VSTD020 Client Smp ID: VSTD020
Inj Date : 10-NOV-2022 15:16
Operator : FT Inst ID: voa10.i
Smp Info : VSTD020;VSTD020;1;6;
Misc Info : V10;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:03 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 14:56 Cal File: X111006.D
Als bottle: 8 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	491937	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.250)	75384	20.0000	17.89(M)
3	Chloromethane	50	1.370	1.370	(0.279)	88167	20.0000	19.17
5	Vinyl Chloride	62	1.452	1.452	(0.295)	86621	20.0000	18.97
6	Bromomethane	94	1.703	1.703	(0.347)	38807	20.0000	18.83
7	Chloroethane	64	1.786	1.786	(0.363)	48943	20.0000	18.61(M)
8	Trichlorofluoromethane	101	1.992	1.992	(0.405)	103347	20.0000	17.22(M)
9	Acrolein	56	2.348	2.348	(0.478)	7569	40.0000	37.32(M)
10	Acetone	43	2.491	2.491	(0.507)	83173	40.0000	38.10
12	Isobutyl Alcohol	43	5.377	5.377	(1.094)	279172	400.000	363.96
13	Acetonitrile	39	2.772	2.772	(0.564)	127839	200.000	185.77
16	Acrylonitrile	53	3.143	3.143	(0.639)	78135	40.0000	43.06
11	1,1-Dichloroethene	96	2.442	2.442	(0.497)	67448	20.0000	23.41
15	Iodomethane	142	2.569	2.569	(0.523)	112670	40.0000	32.71
17	Methylene Chloride	84	2.895	2.895	(0.589)	81339	20.0000	24.21
18	Methyl tert-butyl ether	73	3.192	3.192	(0.649)	255274	20.0000	20.31
19	Carbon Disulfide	76	2.633	2.633	(0.536)	385826	40.0000	45.52
20	trans-1,2-Dichloroethene	96	3.177	3.177	(0.646)	77085	20.0000	20.48
22	1,1-Dichloroethane	63	3.630	3.630	(0.738)	151831	20.0000	22.35
24	2-Butanone	43	4.354	4.354	(0.886)	91965	40.0000	36.05

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	83727	20.0000	18.72
28 Chloroform	83	4.672	4.672 (0.950)	150119	20.0000	18.57

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111007.D Page 2
Report Date: 17-Nov-2022 14:03

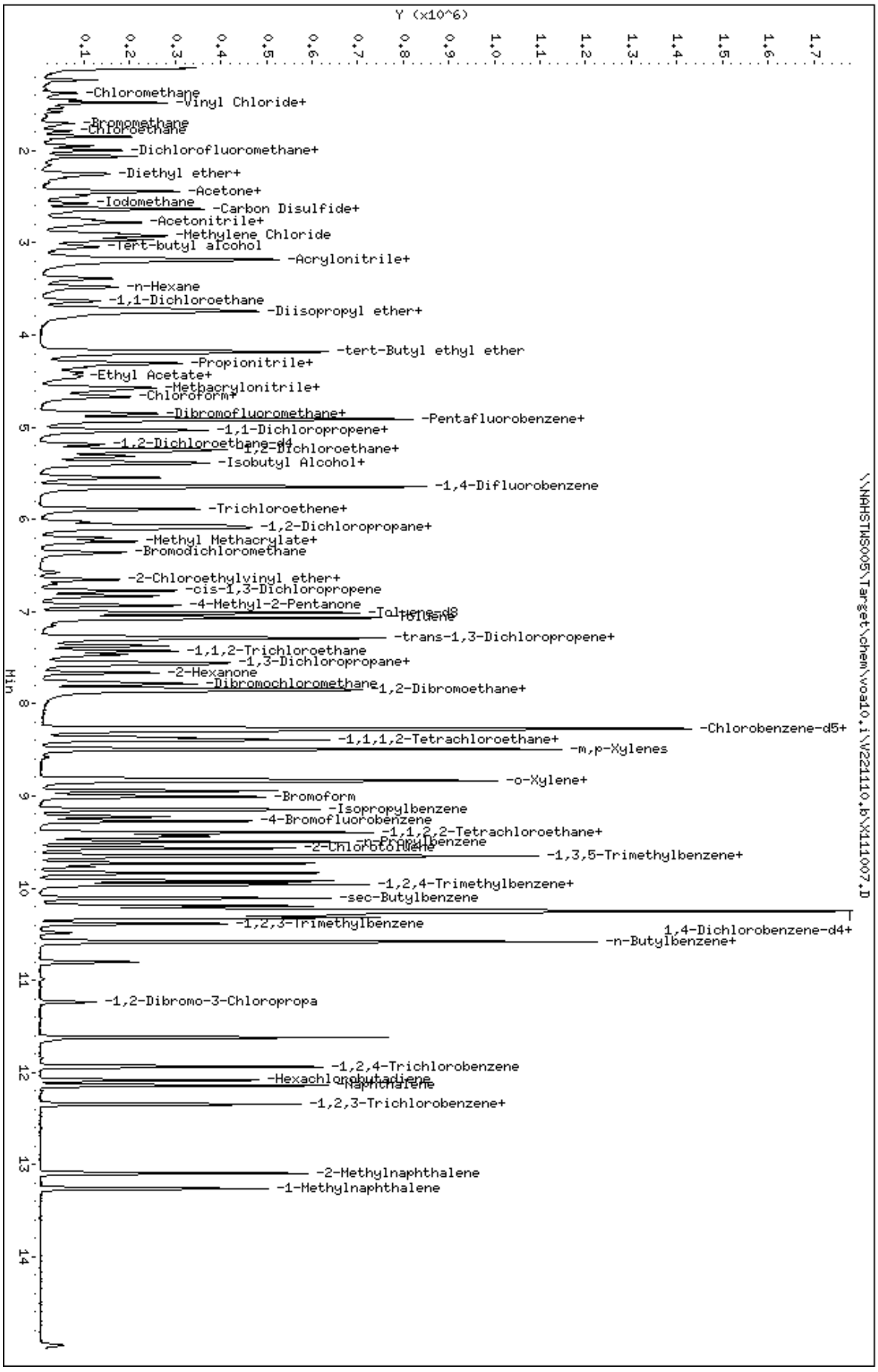
		QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.575	4.575	(0.931)	46933	20.0000	20.97
$	30 Dibromofluoromethane	113	4.841	4.841	(0.985)	83570	20.0000	20.10
	31 1,1,1-Trichloroethane	97	4.863	4.863	(0.989)	122097	20.0000	18.80
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	116330	20.0000	20.71(M)
	33 1,2-Dichloroethane	62	5.265	5.265	(0.932)	130582	20.0000	19.39
	34 Carbon Tetrachloride	117	5.032	5.032	(0.891)	92532	20.0000	19.04(MH)
$	35 1,2-Dichloroethane-d4	65	5.190	5.190	(1.056)	104063	20.0000	19.71
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	728667	50.0000	
	37 Benzene	78	5.242	5.242	(0.928)	363349	20.0000	19.58
	38 Trichloroethene	130	5.887	5.887	(1.042)	97033	20.0000	20.44
	39 Bromodichloromethane	83	6.359	6.359	(1.126)	112227	20.0000	19.39
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	101409	20.0000	19.56
	45 4-Methyl-2-Pentanone	43	6.933	6.933	(0.839)	210057	40.0000	38.58
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.199)	151653	20.0000	19.61
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	626131	50.0000	
$	48 Toluene-d8	98	7.011	7.011	(0.848)	328150	20.0000	20.95
	50 Toluene	91	7.068	7.068	(0.855)	363217	20.0000	19.68
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.287)	127134	20.0000	18.70
	52 2-Hexanone	43	7.664	7.664	(0.927)	158977	40.0000	40.28
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	71278	20.0000	19.30
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	148710	20.0000	19.60
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	88374	20.0000	18.33
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	75041	20.0000	19.59(M)
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	86795	20.0000	19.19
	59 Chlorobenzene	112	8.293	8.293	(1.003)	231363	20.0000	18.36
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	85533	20.0000	18.95
	61 Ethylbenzene	106	8.391	8.391	(1.015)	117536	20.0000	19.05
	62 m,p-Xylenes	106	8.492	8.492	(1.027)	293995	40.0000	38.70
	63 o-Xylene	106	8.830	8.830	(1.068)	142668	20.0000	18.80
	64 Styrene	104	8.841	8.841	(1.069)	257911	20.0000	18.71
	66 Bromoform	173	8.991	8.991	(1.088)	66465	20.0000	18.94
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	350025	20.0000	18.59
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	132209	20.0000	19.77
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	125568	20.0000	20.71
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	405324	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	315717	20.0000	19.12
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	263889	20.0000	18.53(M)
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	332475	20.0000	18.53
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	366131	20.0000	18.29(M)
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	324742	20.0000	18.60
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	426338	20.0000	19.28
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	154945	20.0000	17.98
	83 1,3-Dichlorobenzene	146	10.194	10.194	(0.995)	216628	20.0000	17.49
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	228364	20.0000	19.79
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	225895	20.0000	19.98
	89 1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	21888	20.0000	17.46
	90 1,2,4-Trichlorobenzene	180	11.937	11.937	(1.165)	170245	20.0000	19.86(M)
	92 Naphthalene	128	12.143	12.143	(1.185)	419075	20.0000	18.38
	136 n-Hexane	57	3.484	3.484	(0.709)	99612	20.0000	19.36
	147 Methylcyclohexane	55	6.067	6.067	(1.074)	132444	20.0000	19.83
	141 Cyclohexane	56	4.912	4.912	(0.999)	96410	20.0000	22.93(M)
	138 Freon TF	101	2.453	2.453	(0.499)	56211	20.0000	22.99(M)

146	Methyl Acetate	43	2.805	2.805 (0.571)	80208	20.0000	19.90
21	Vinyl Acetate	43	3.713	3.713 (0.755)	420877	40.0000	42.18(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	AMOUNTS ON-COL (ug/l)
	26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	115665	20.0000	19.42
	44 Dibromomethane	93	6.198	6.198	(1.098)	55692	20.0000	18.76
	91 Hexachlorobutadiene	225	12.087	12.087	(1.179)	80136	20.0000	24.65
	74 Bromobenzene	156	9.396	9.396	(0.917)	118062	20.0000	19.08
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	273531	20.0000	20.10
	77 4-Chlorotoluene	91	9.654	9.654	(0.942)	326663	20.0000	18.92
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	340580	20.0000	18.70
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	160233	20.0000	20.07
	148 tert-Butyl Alcohol	59	3.045	3.045	(0.620)	175331	400.000	284.51
	142 Tetrahydrofuran	42	4.646	4.646	(0.945)	38402	40.0000	38.04
M	94 1,2-Dichloroethylene (total)	96				160812	40.0000	
M	95 Xylenes (total)	106				436663	60.0000	

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Client ID: VSTD020
Sample Info: VSTD020;VSTD020;1;6;
Purge Volume: 5.0
Column phase: DB624

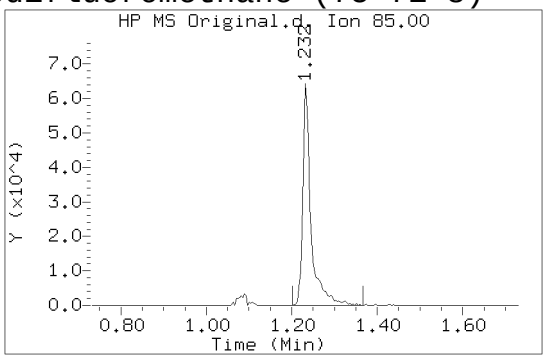
Instrument: voa10.i
Operator: FT
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111007.D
Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

Dichlorodifluoromethane (75-71-8)

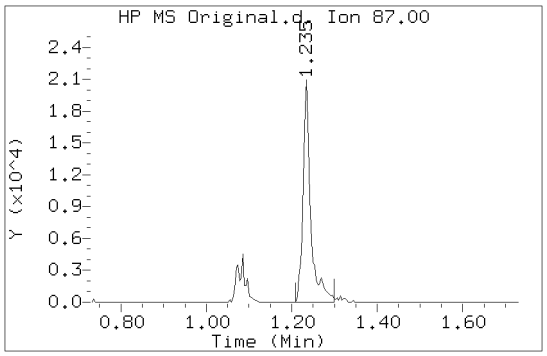
BEFORE

MASS
85
AREA
88142
HEIGHT
64280
17-Nov-2022
13:58
linh
pham



BEFORE

MASS
87
AREA
26823
HEIGHT
20952
17-Nov-2022
13:58
linh
pham



Reason Code:

AFTER

MASS
85
AREA
75384
HEIGHT
64280
17-Nov-2022
14:02
linh
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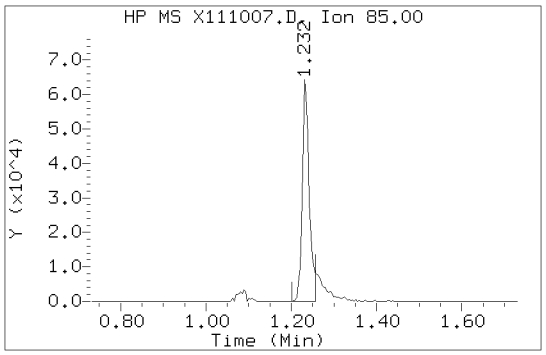

AFTER

MASS
87
AREA
26823
HEIGHT
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17-Nov-2022
14:02
linh
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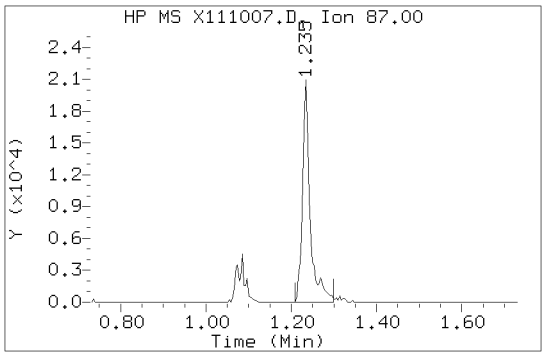

Chloroethane (75-00-3)

BEFORE

MASS
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AREA
52301
HEIGHT
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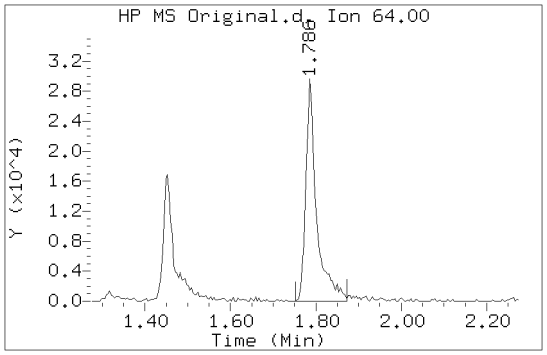
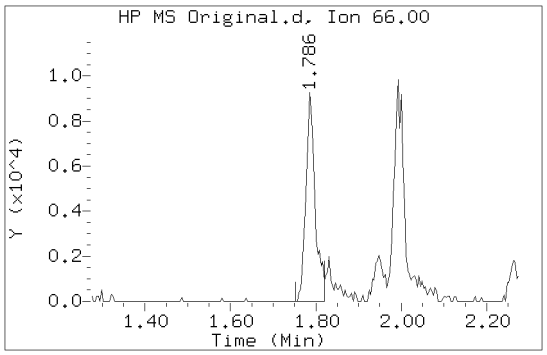
17-Nov-2022
13:58
linh
pham



BEFORE

MASS
66
AREA
14107
HEIGHT
9273
17-Nov-2022
13:58
linh
pham



Reason Code:

AFTER

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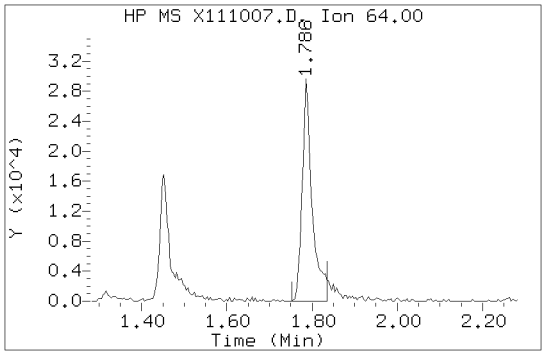
64
AREA
48943
HEIGHT
29640
17-Nov-2022
14:02
linh
pham



AFTER

MASS
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AREA
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9273
17-Nov-2022
14:02
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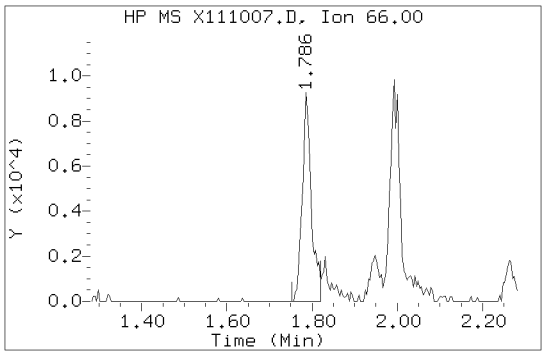
pham



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Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

Trichlorofluoromethane (75-69-4)

Reason Code:

BEFORE

MASS
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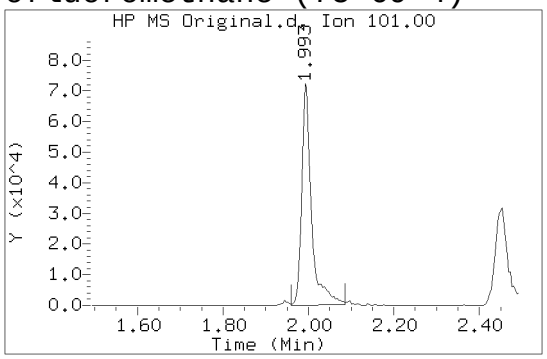
AREA
115955
HEIGHT
72239
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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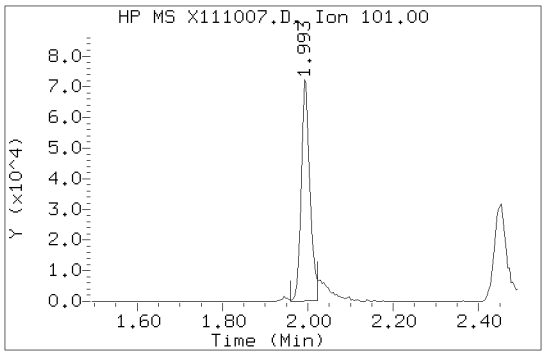
AREA
103347
HEIGHT
72239
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
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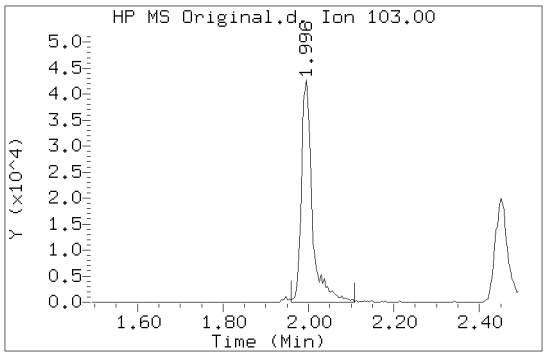
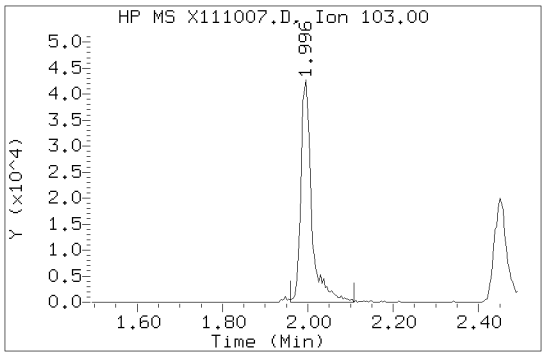
AREA
77262
HEIGHT
42720
17-Nov-2022
13:58
linh
pham



AFTER

MASS
103
AREA
77262
HEIGHT
42720
17-Nov-2022
14:02
linh
pham

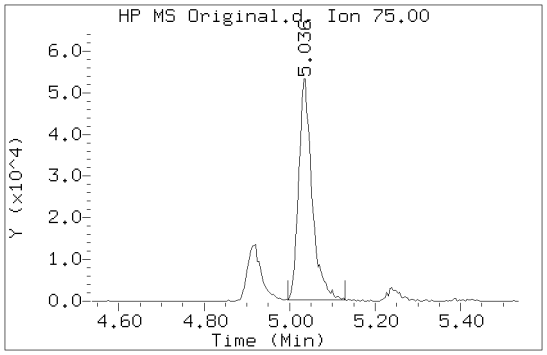


1,1-Dichloropropene (563-58-6)

Reason Code:

BEFORE

MASS
75
AREA
117760
HEIGHT
53067
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
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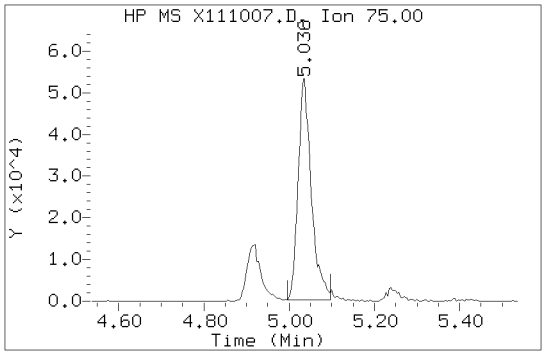
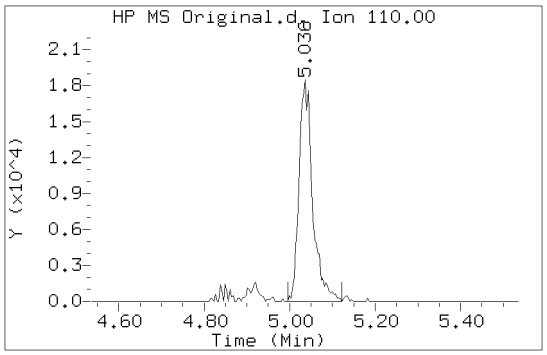
HEIGHT
53067
17-Nov-2022
14:02
linh
pham



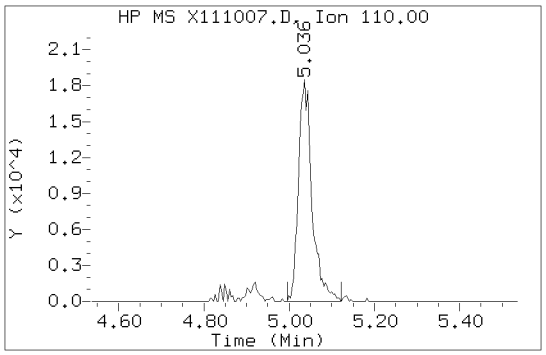
BEFORE

MASS
110
AREA
41625
HEIGHT
18496
17-Nov-2022
13:58
linh
pham



AFTER

MASS
110
AREA
41625
HEIGHT
18496
17-Nov-2022
14:02
linh
pham



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Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

1,1-Dichloropropene (563-58-6)

Reason Code:

BEFORE

MASS
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AREA
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HEIGHT
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17-Nov-2022
13:58
linh
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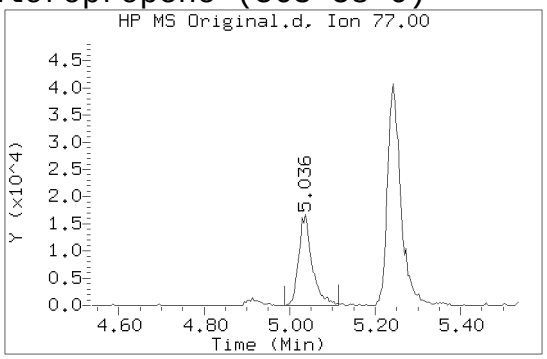

AFTER

MASS
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AREA
37103
HEIGHT
16800
17-Nov-2022
14:02
linh
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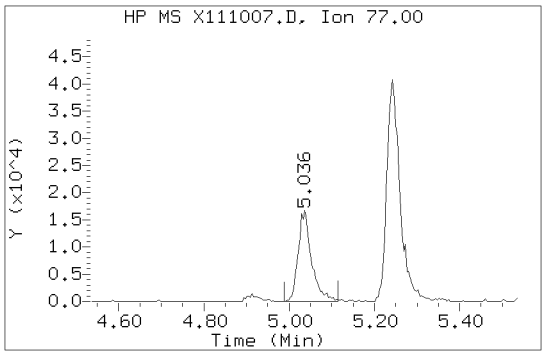

Carbon Tetrachloride (56-23-5)

Reason Code:

BEFORE

MASS
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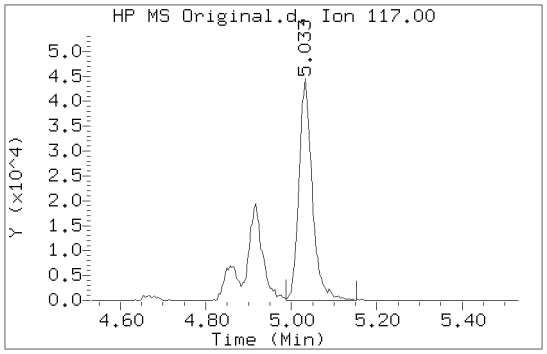
AREA
98390
HEIGHT
44528
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
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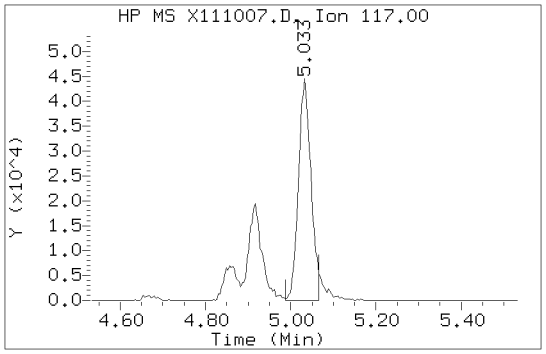
HEIGHT
44528
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
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AREA
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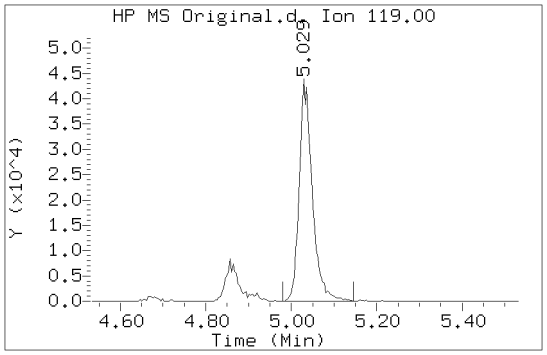
HEIGHT
43928
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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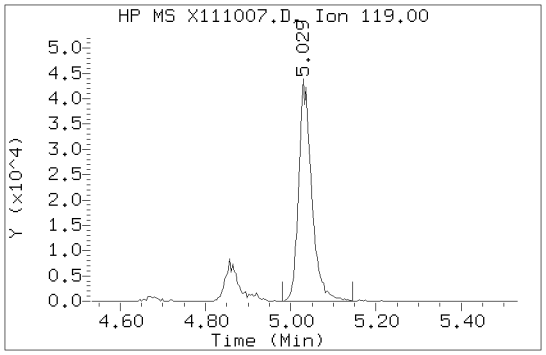
AREA
94570
HEIGHT
43928
17-Nov-2022
14:02
linh
pham

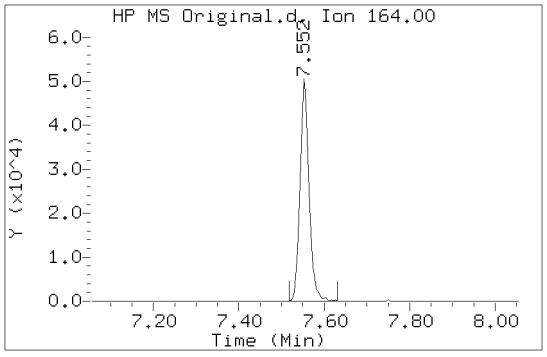


Tetrachloroethene (127-18-4)

Reason Code:

BEFORE

MASS
164
AREA
75831
HEIGHT
50560
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
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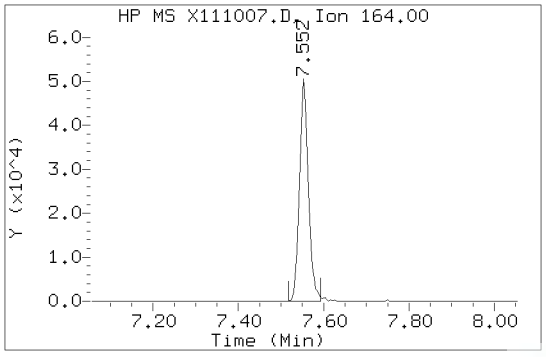
HEIGHT
50560
17-Nov-2022
14:02
linh
pham



Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111007.D
Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

Tetrachloroethene (127-18-4)

Reason Code:

BEFORE

MASS
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AREA
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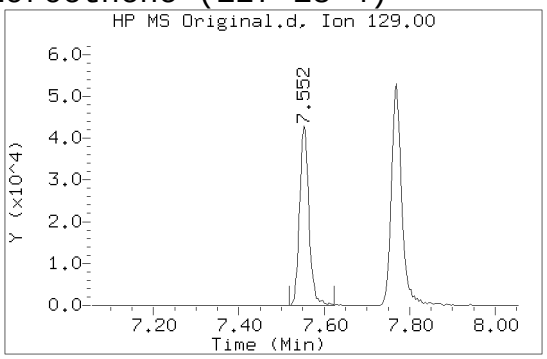
HEIGHT
42936
17-Nov-2022
13:58
linh
pham



AFTER

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HEIGHT
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17-Nov-2022
14:02
linh
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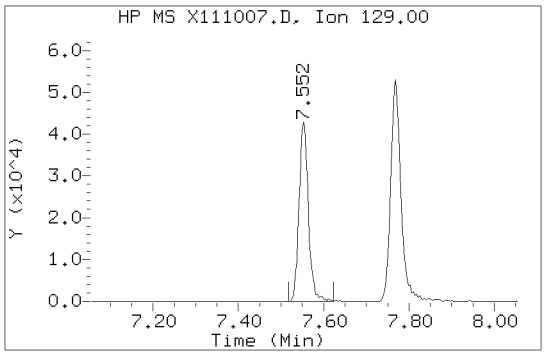

BEFORE

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17-Nov-2022
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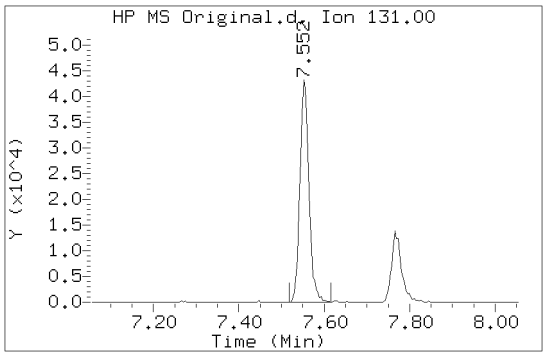

AFTER

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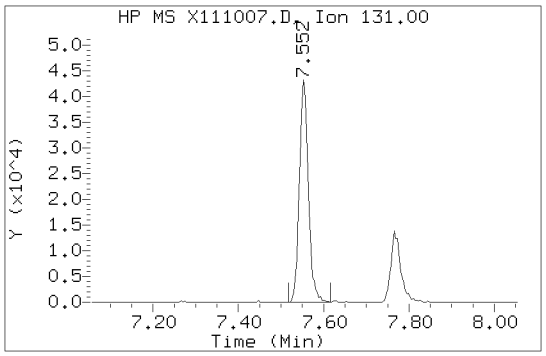

Vinyl Acetate (108-05-4)

Reason Code:

BEFORE

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HEIGHT
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17-Nov-2022
13:58
linh
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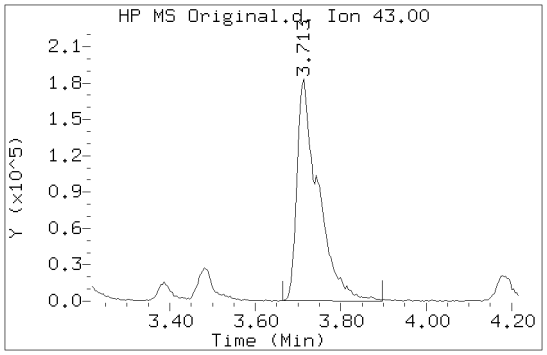

AFTER

MASS
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AREA
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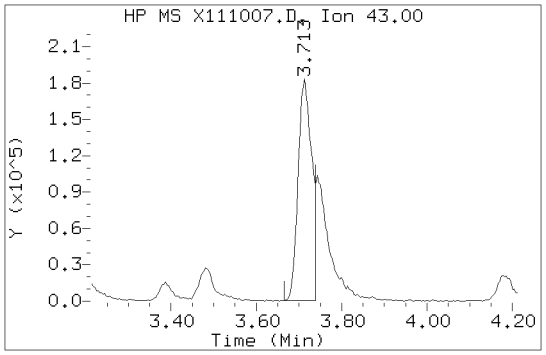
HEIGHT
183008
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
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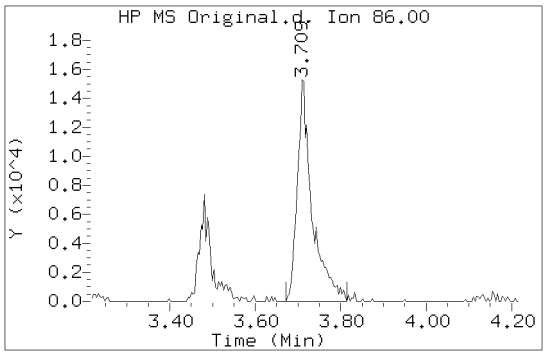
AREA
37362
HEIGHT
15288
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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37362
HEIGHT
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17-Nov-2022
14:02
linh
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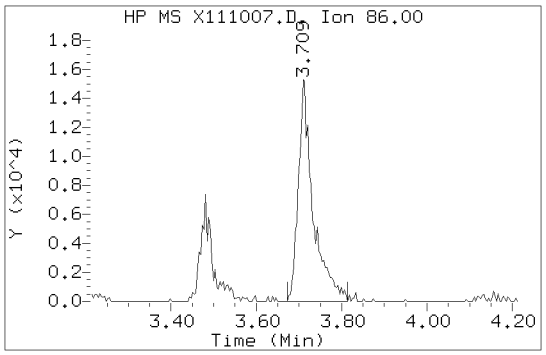

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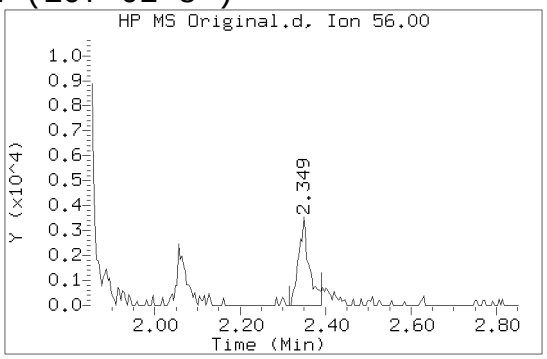
Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

Acrolein (107-02-8)

Reason Code:

BEFORE

MASS
56
AREA
6200
HEIGHT
3540
17-Nov-2022
13:58
linh
pham



AFTER

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HEIGHT
3540
17-Nov-2022
14:02
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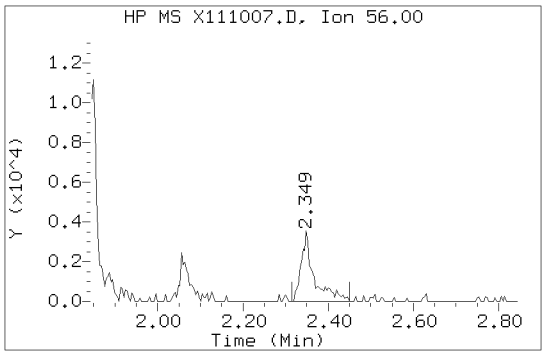

BEFORE

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13:58
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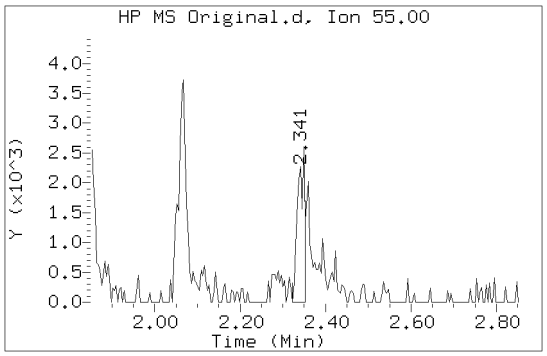

AFTER

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14:02
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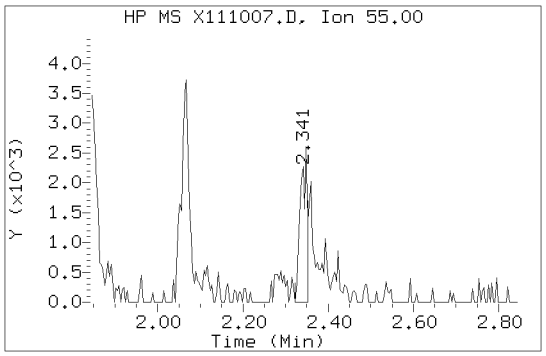

tert-Butylbenzene (98-06-6)

Reason Code:

BEFORE

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17-Nov-2022
13:58
linh
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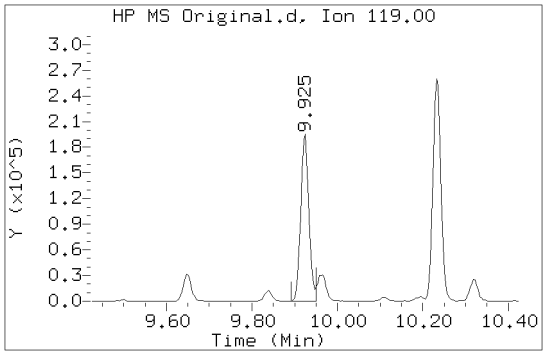

AFTER

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14:02
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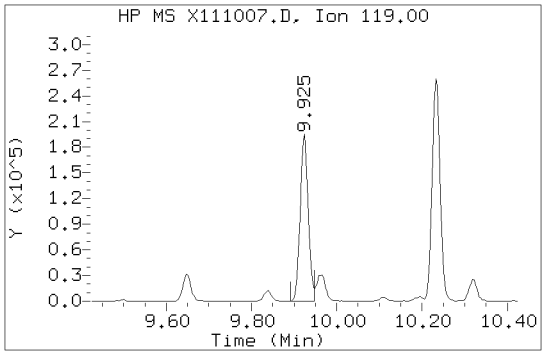

BEFORE

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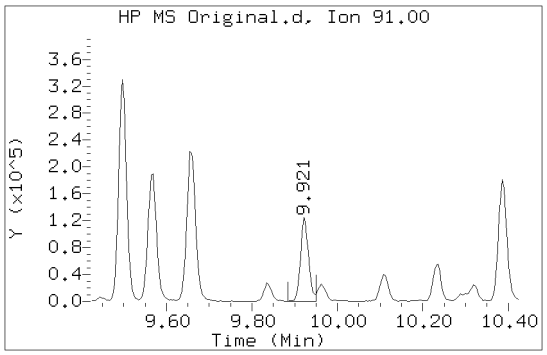
AREA
169250
HEIGHT
125280
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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HEIGHT
125280
17-Nov-2022
14:02
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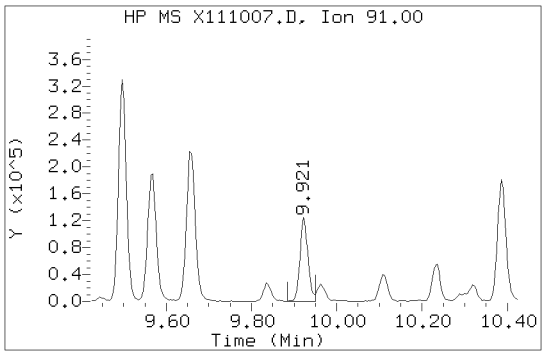
pham



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Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

tert-Butylbenzene (98-06-6)

Reason Code:

BEFORE

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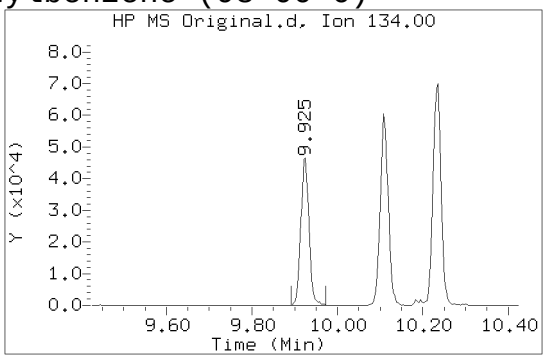
AREA
63765
HEIGHT
46616
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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63765
HEIGHT
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17-Nov-2022
14:02
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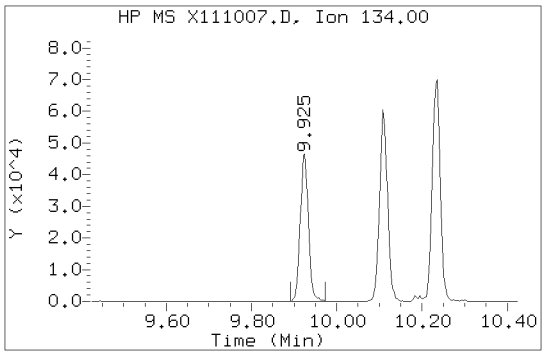
pham



sec-Butylbenzene (135-98-8)

Reason Code:

BEFORE

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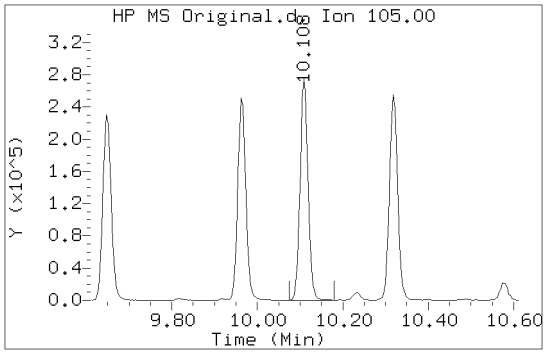
105
AREA
366677
HEIGHT
274973
17-Nov-2022
13:58
linh
pham



AFTER

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17-Nov-2022
14:02
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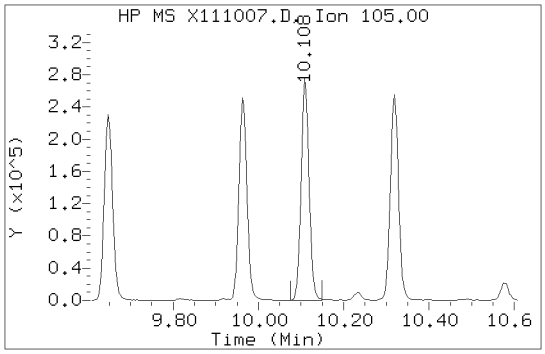

BEFORE

MASS
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AREA
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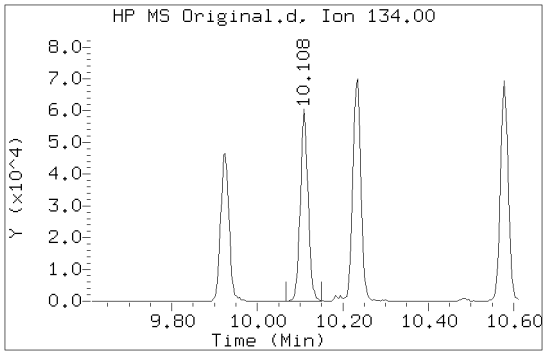
HEIGHT
60400
17-Nov-2022
13:58
linh
pham



AFTER

MASS
134
AREA
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17-Nov-2022
14:02
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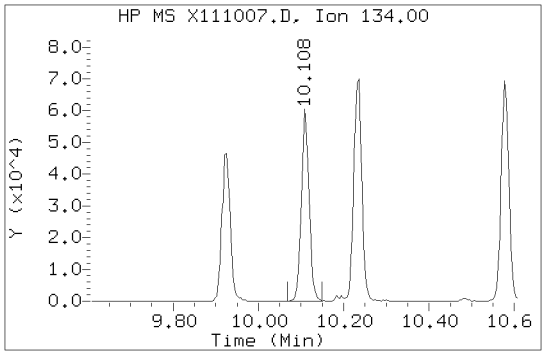
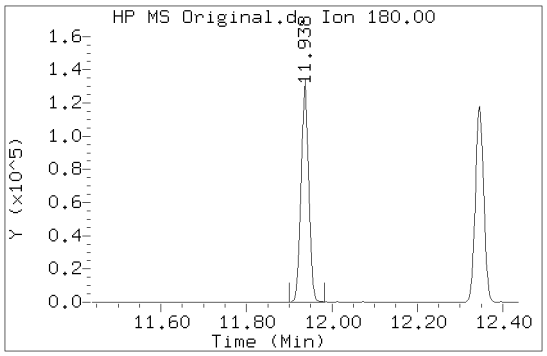


1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

BEFORE

MASS
180
AREA
170029
HEIGHT
133888
17-Nov-2022
13:58
linh
pham



AFTER

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133888
17-Nov-2022
14:02
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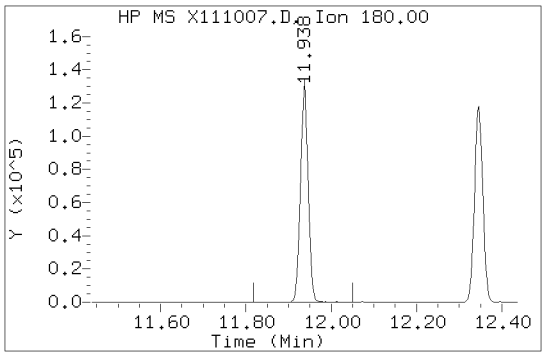

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Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

BEFORE

MASS
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HEIGHT
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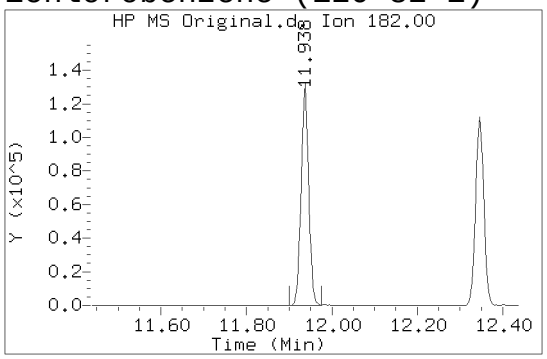
17-Nov-2022
13:58
linh
pham



AFTER

MASS
182
AREA
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HEIGHT
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17-Nov-2022
14:02
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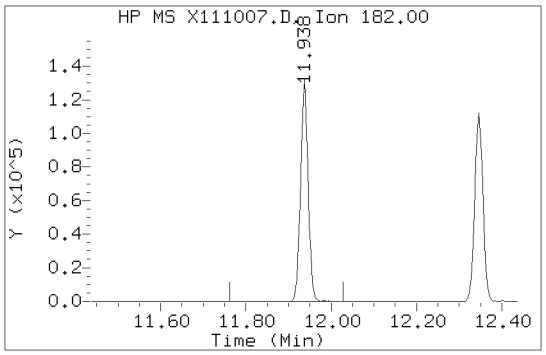

BEFORE

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HEIGHT
34144
17-Nov-2022
13:58
linh
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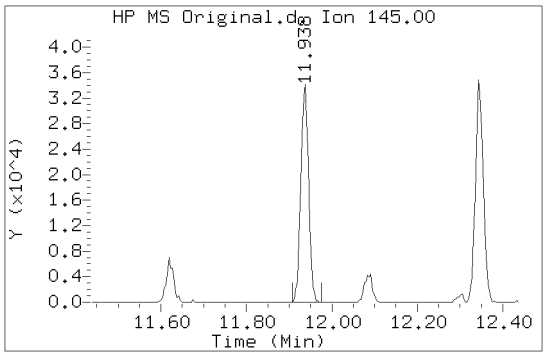

AFTER

MASS
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14:02
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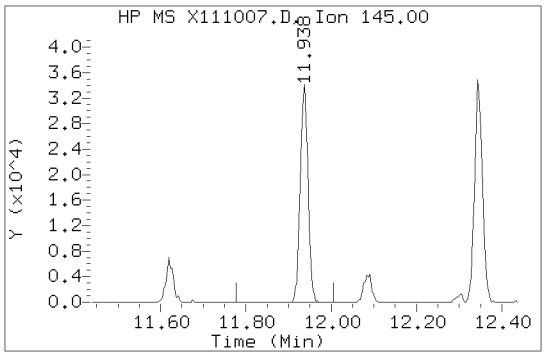

Cyclohexane (110-82-7)

Reason Code:

BEFORE

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56
AREA
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HEIGHT
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17-Nov-2022
13:58
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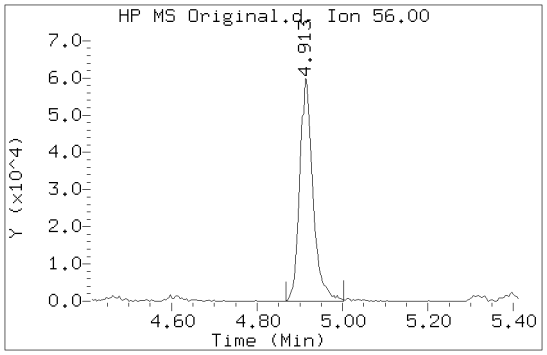

AFTER

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AREA
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59752
17-Nov-2022
14:02
linh
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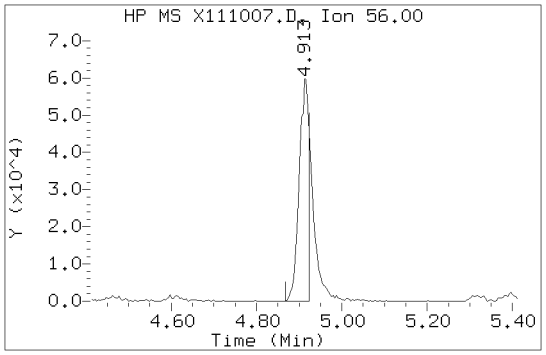

BEFORE

MASS
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17-Nov-2022
13:58
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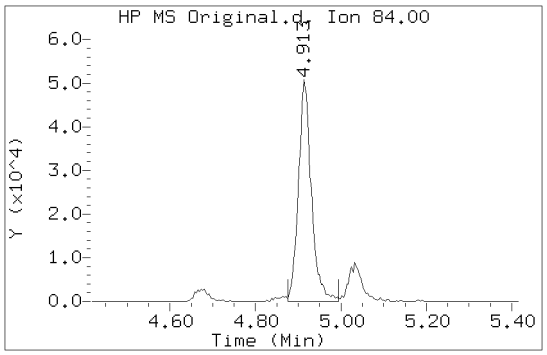

AFTER

MASS
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AREA
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17-Nov-2022
14:02
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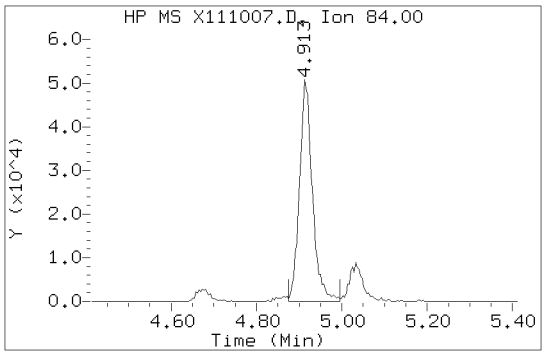
pham



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Inj Date : 10-NOV-2022 15:16
InstruID : voa10.i
LabSampID : VSTD020

Cyclohexane (110-82-7)

Reason Code:

BEFORE

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17-Nov-2022
13:58
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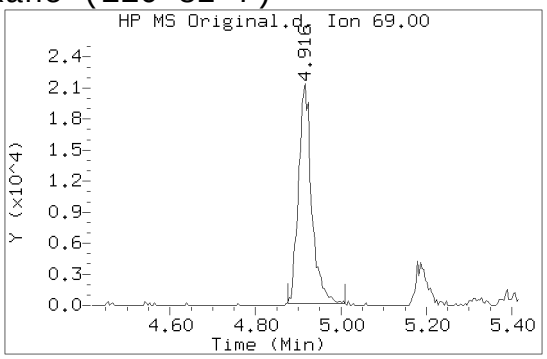

AFTER

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17-Nov-2022
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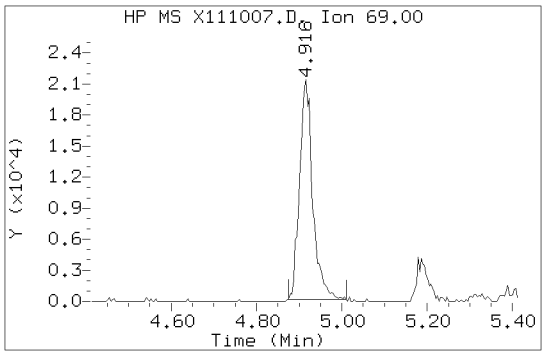

Freon TF (76-13-1)

Reason Code:

BEFORE

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101
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HEIGHT
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17-Nov-2022
13:58
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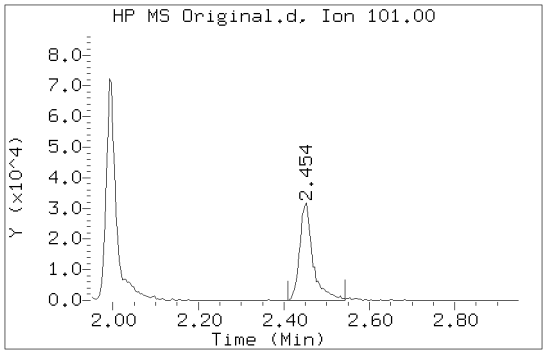

AFTER

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17-Nov-2022
14:02
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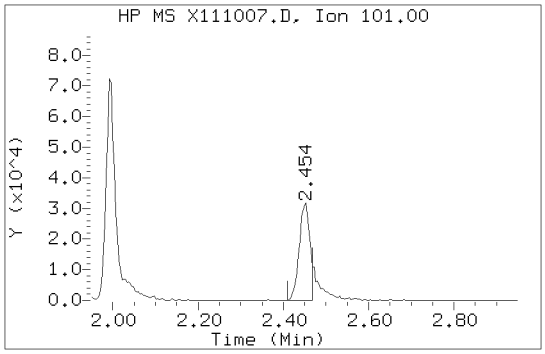

BEFORE

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17-Nov-2022
13:58
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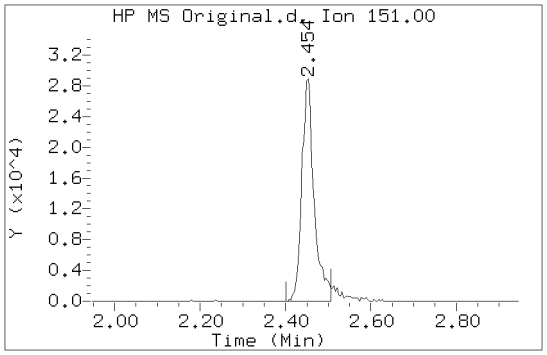

AFTER

MASS
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HEIGHT
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17-Nov-2022
14:02
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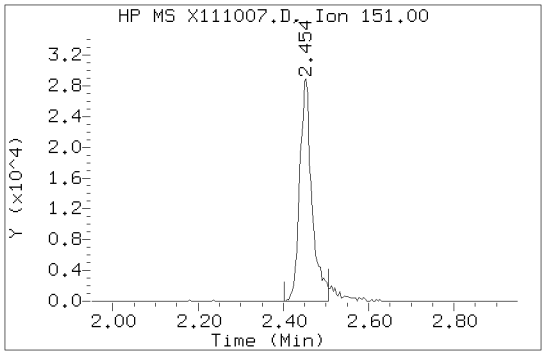


Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111008.D Page 1
Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111008.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 10-NOV-2022 15:37
Operator : FT Inst ID: voa10.i
Smp Info : VSTD050;VSTD050;1;7;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:03 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:16 Cal File: X111007.D
Als bottle: 9 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	496661	50.0000	
2	Dichlorodifluoromethane	85	1.235	1.235	(0.251)	164734	50.0000	38.73
3	Chloromethane	50	1.370	1.370	(0.279)	190655	50.0000	41.07
5	Vinyl Chloride	62	1.452	1.452	(0.296)	189160	50.0000	41.03
6	Bromomethane	94	1.704	1.704	(0.347)	84281	50.0000	40.51(M)
7	Chloroethane	64	1.786	1.786	(0.363)	102053	50.0000	38.43(M)
8	Trichlorofluoromethane	101	1.996	1.996	(0.406)	211451	50.0000	34.90
9	Acrolein	56	2.348	2.348	(0.478)	24619	100.000	122.75(M)
10	Acetone	43	2.491	2.491	(0.507)	218941	100.000	108.09
12	Isobutyl Alcohol	43	5.377	5.377	(1.094)	750654	1000.00	969.33
13	Acetonitrile	39	2.779	2.779	(0.565)	326552	500.000	470.03
16	Acrylonitrile	53	3.147	3.147	(0.640)	185985	100.000	101.53
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	144416	50.0000	47.80
15	Iodomethane	142	2.569	2.569	(0.523)	355942	100.000	91.40
17	Methylene Chloride	84	2.899	2.899	(0.590)	200956	50.0000	62.11
18	Methyl tert-butyl ether	73	3.196	3.196	(0.650)	671086	50.0000	52.89
19	Carbon Disulfide	76	2.633	2.633	(0.536)	878513	100.000	101.13
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	176198	50.0000	46.37
22	1,1-Dichloroethane	63	3.630	3.630	(0.738)	336253	50.0000	48.40
24	2-Butanone	43	4.350	4.350	(0.885)	248500	100.000	96.48

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	209368	50.0000	46.36
28 Chloroform	83	4.672	4.672 (0.950)	364891	50.0000	44.72

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111008.D Page 2
Report Date: 17-Nov-2022 14:03

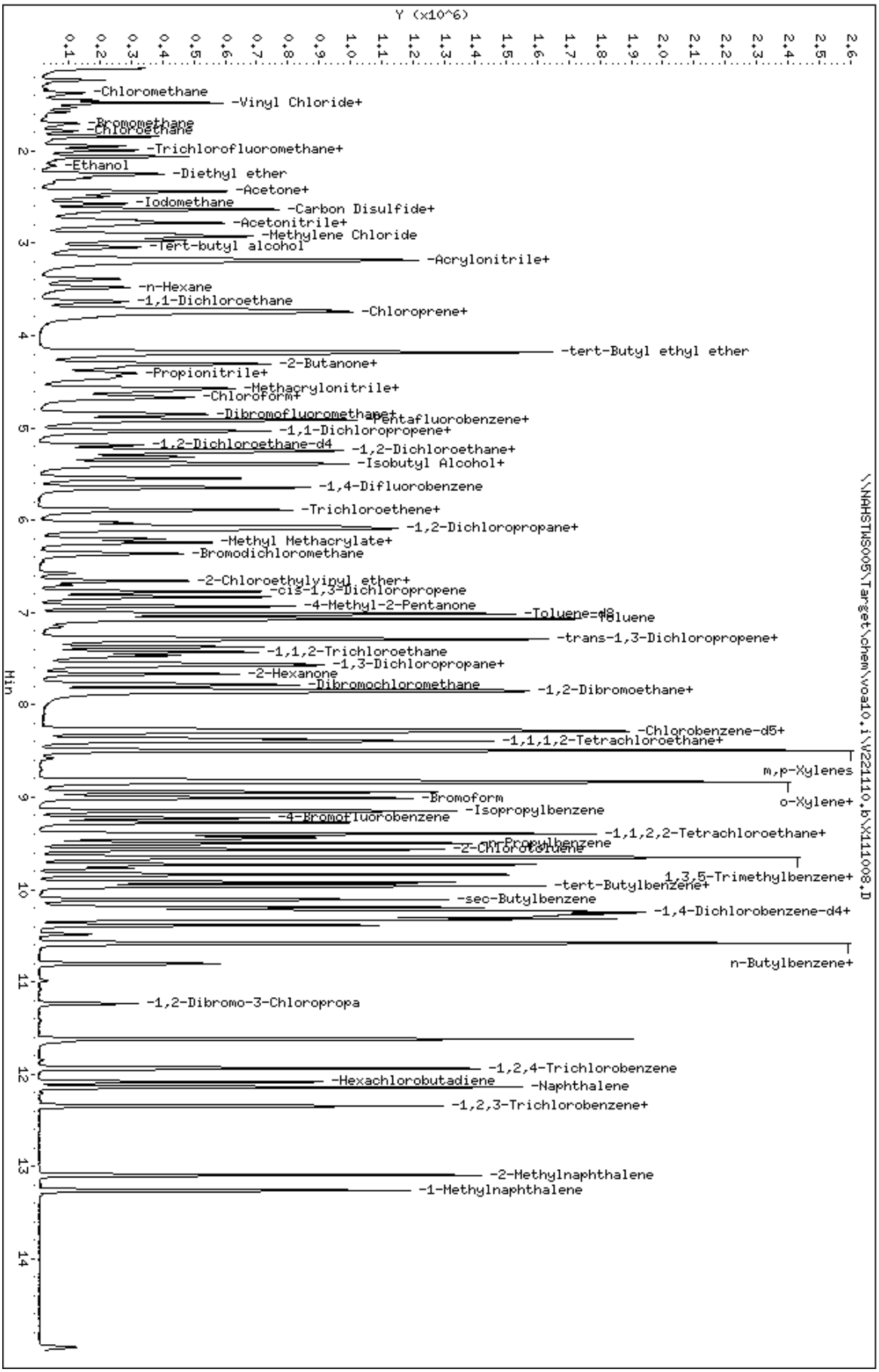
			QUANT SIG					AMOUNTS	
								CAL-AMT	ON-COL
		Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ug/l)	(ug/l)
	29	Bromochloromethane	128	4.571	4.571	(0.930)	114461	50.0000	50.66
$	30	Dibromofluoromethane	113	4.845	4.845	(0.986)	191319	50.0000	45.59
	31	1,1,1-Trichloroethane	97	4.856	4.856	(0.988)	252229	50.0000	38.47
	32	1,1-Dichloropropene	75	5.036	5.036	(0.892)	228292	50.0000	40.20
	33	1,2-Dichloroethane	62	5.265	5.265	(0.932)	311182	50.0000	45.70
	34	Carbon Tetrachloride	117	5.029	5.029	(0.890)	189690	50.0000	38.61(MH)
$	35	1,2-Dichloroethane-d4	65	5.190	5.190	(1.056)	243555	50.0000	45.70
*	36	1,4-Difluorobenzene	114	5.647	5.647	(1.000)	736777	50.0000	
	37	Benzene	78	5.246	5.246	(0.929)	838606	50.0000	44.71
	38	Trichloroethene	130	5.887	5.887	(1.042)	209686	50.0000	43.68
	39	Bromodichloromethane	83	6.359	6.359	(1.126)	269119	50.0000	45.99
	42	1,2-Dichloropropane	63	6.097	6.097	(1.080)	243682	50.0000	46.49
	45	4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	530824	100.000	93.11
	46	cis-1,3-Dichloropropene	75	6.775	6.775	(1.200)	381163	50.0000	48.74
*	47	Chlorobenzene-d5	117	8.267	8.267	(1.000)	626013	50.0000	
$	48	Toluene-d8	98	7.012	7.012	(0.848)	698101	50.0000	44.27
	50	Toluene	91	7.072	7.072	(0.855)	863285	50.0000	46.78
	51	trans-1,3-Dichloropropene	75	7.270	7.270	(1.287)	322081	50.0000	46.87
	52	2-Hexanone	43	7.668	7.668	(0.927)	382051	100.000	94.42
	53	1,1,2-Trichloroethane	83	7.431	7.431	(0.899)	173487	50.0000	46.98
	54	1,3-Dichloropropane	76	7.574	7.574	(0.916)	357983	50.0000	47.19
	55	Dibromochloromethane	129	7.769	7.769	(0.940)	223433	50.0000	46.37
	56	Tetrachloroethene	164	7.551	7.551	(0.913)	159305	50.0000	41.59
	57	1,2-Dibromoethane	107	7.863	7.863	(0.951)	215277	50.0000	47.62
	59	Chlorobenzene	112	8.294	8.294	(1.003)	558826	50.0000	44.37
	60	1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	207367	50.0000	45.95
	61	Ethylbenzene	106	8.391	8.391	(1.015)	263054	50.0000	42.64
	62	m,p-Xylenes	106	8.496	8.496	(1.028)	664615	100.000	87.52
	63	o-Xylene	106	8.833	8.833	(1.068)	336457	50.0000	44.36
	64	Styrene	104	8.841	8.841	(1.069)	624914	50.0000	45.36
	66	Bromoform	173	8.995	8.995	(1.088)	164151	50.0000	45.09
	67	Isopropylbenzene	105	9.148	9.148	(1.107)	756936	50.0000	40.22
	68	1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	322468	50.0000	48.64
$	69	4-Bromofluorobenzene	95	9.276	9.276	(1.122)	274831	50.0000	44.23
*	70	1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	403883	50.0000	
	75	1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	714219	50.0000	43.41
	78	tert-Butylbenzene	119	9.924	9.924	(0.968)	568233	50.0000	40.04
	79	1,2,4-Trimethylbenzene	105	9.966	9.966	(0.972)	766567	50.0000	42.87
	81	sec-Butylbenzene	105	10.108	10.108	(0.986)	760571	50.0000	38.13
	87	n-Butylbenzene	91	10.577	10.577	(1.032)	666986	50.0000	38.34
	73	n-Propylbenzene	91	9.497	9.497	(0.926)	921704	50.0000	41.83
	71	1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	376814	50.0000	43.88
	83	1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	517845	50.0000	41.98
	84	1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	548142	50.0000	46.86
	88	1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	540647	50.0000	48.01
	89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	60051	50.0000	48.09
	90	1,2,4-Trichlorobenzene	180	11.937	11.937	(1.165)	388008	50.0000	45.37(M)
	92	Naphthalene	128	12.144	12.144	(1.185)	1033096	50.0000	45.47
	136	n-Hexane	57	3.480	3.480	(0.708)	156893	50.0000	30.20
	147	Methylcyclohexane	55	6.067	6.067	(1.074)	316157	50.0000	46.82
	141	Cyclohexane	56	4.912	4.912	(0.999)	218836	50.0000	48.35
	138	Freon TF	101	2.450	2.450	(0.498)	125676	50.0000	48.17

146	Methyl Acetate	43	2.809	2.809 (0.572)	214916	50.0000	52.82
21	Vinyl Acetate	43	3.717	3.717 (0.756)	1001604	100.000	99.43(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	243262	50.0000	40.46
44	Dibromomethane	93	6.206	6.206	(1.099)	136897	50.0000	45.63
91	Hexachlorobutadiene	225	12.084	12.084	(1.179)	158258	50.0000	46.98
74	Bromobenzene	156	9.399	9.399	(0.917)	285201	50.0000	46.26
76	2-Chlorotoluene	91	9.568	9.568	(0.933)	635892	50.0000	45.03
77	4-Chlorotoluene	91	9.658	9.658	(0.942)	756893	50.0000	43.99
82	p-Isopropyltoluene	119	10.232	10.232	(0.998)	729507	50.0000	40.21
93	1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	365195	50.0000	46.24
148	tert-Butyl Alcohol	59	3.042	3.042	(0.619)	446629	1000.00	717.86
142	Tetrahydrofuran	42	4.646	4.646	(0.945)	107289	100.000	105.28
M 94	1,2-Dichloroethylene (total)	96				385566	100.000	
M 95	Xylenes (total)	106				1001072	150.000	

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Date : 10-NOV-2022 15:37
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;1;7;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10,i
Operator: FT
Column diameter: 0.18

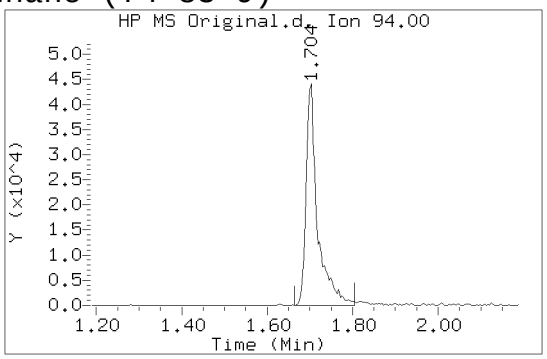
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111008.D
Inj Date : 10-NOV-2022 15:37
InstruID : voa10.i
LabSampID : VSTD050

Bromomethane (74-83-9)

Reason Code:

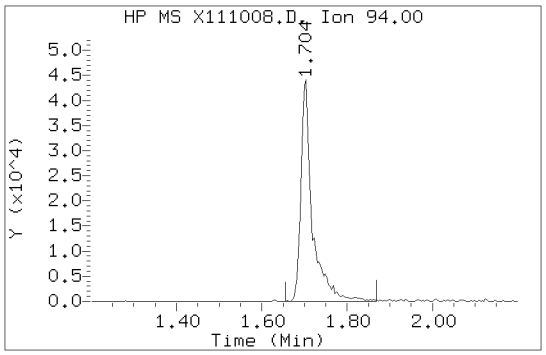
BEFORE

MASS
94
AREA
82570
HEIGHT
44144
17-Nov-2022
13:58
linh
pham



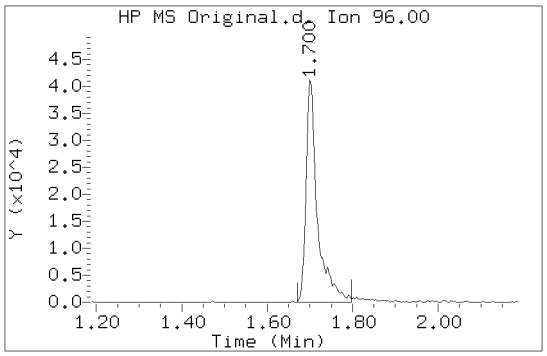
AFTER

MASS
94
AREA
84281
HEIGHT
44144
17-Nov-2022
14:02
linh
pham



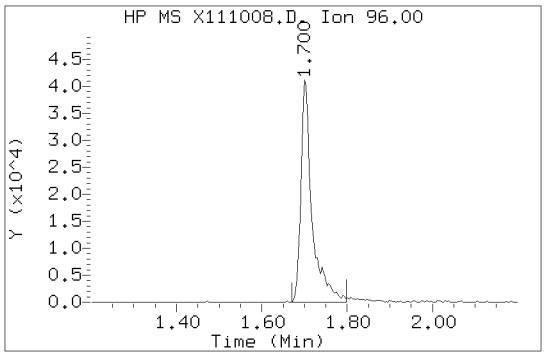
BEFORE

MASS
96
AREA
76922
HEIGHT
41168
17-Nov-2022
13:58
linh
pham



AFTER

MASS
96
AREA
76922
HEIGHT
41168
17-Nov-2022
14:02
linh
pham



Chloroethane (75-00-3)

Reason Code:

BEFORE

MASS
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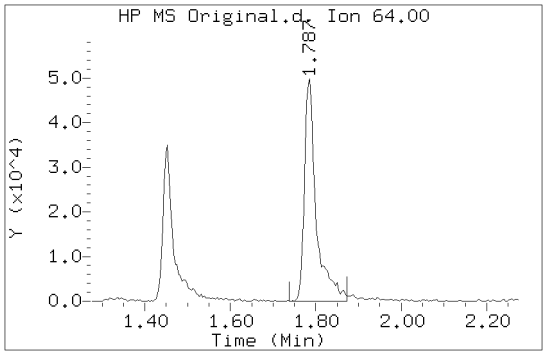
AREA
97408
HEIGHT
49800
17-Nov-2022
13:58
linh
pham



AFTER

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AREA
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HEIGHT
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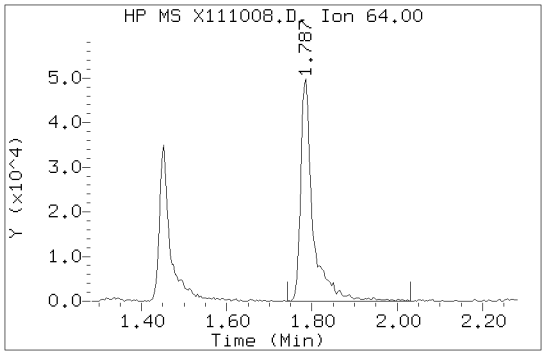
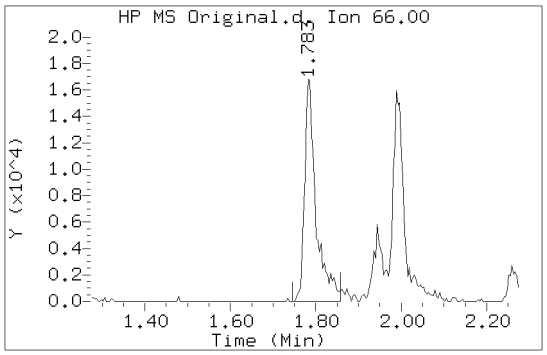
17-Nov-2022
14:02
linh
pham



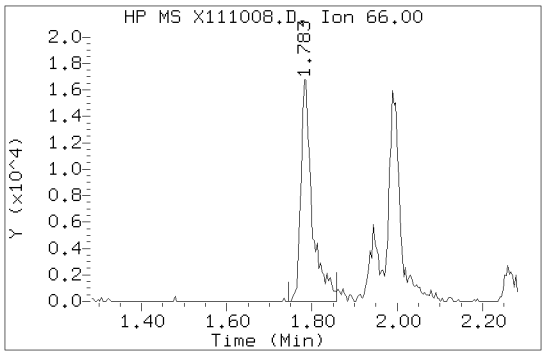
BEFORE

MASS
66
AREA
31586
HEIGHT
16768
17-Nov-2022
13:58
linh
pham



AFTER

MASS
66
AREA
31586
HEIGHT
16768
17-Nov-2022
14:02
linh
pham



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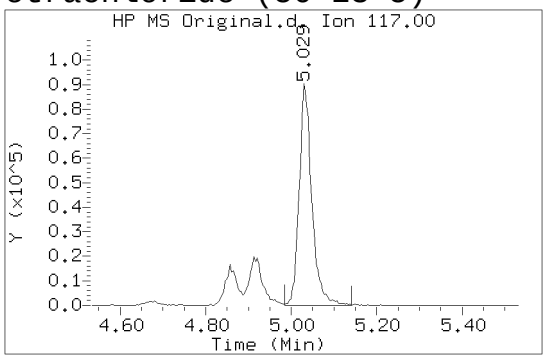
Inj Date : 10-NOV-2022 15:37
InstruID : voa10.i
LabSampID : VSTD050

Carbon Tetrachloride (56-23-5)

Reason Code:

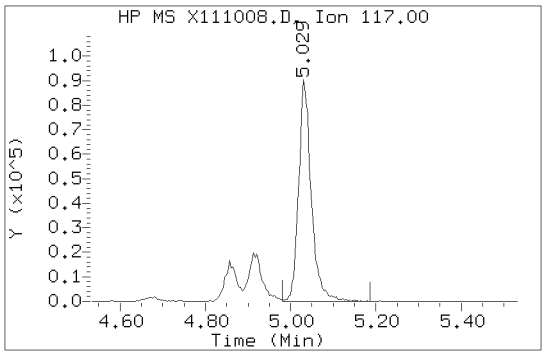
BEFORE

MASS
117
AREA
188953
HEIGHT
90408
17-Nov-2022
13:58
linh
pham



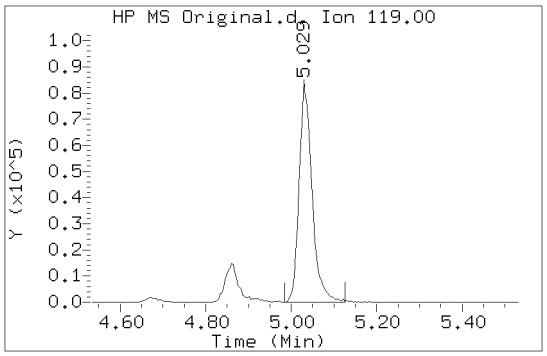
AFTER

MASS
117
AREA
189690
HEIGHT
90425
17-Nov-2022
14:02
linh
pham



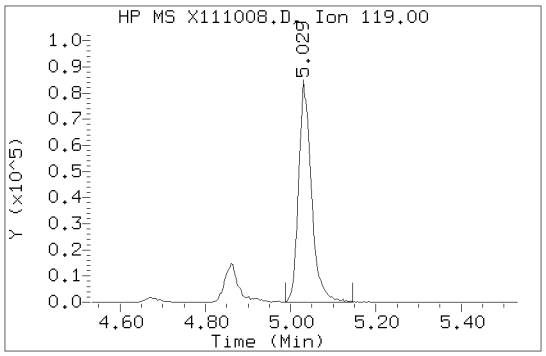
BEFORE

MASS
119
AREA
179898
HEIGHT
85016
17-Nov-2022
13:58
linh
pham



AFTER

MASS
119
AREA
180229
HEIGHT
85016
17-Nov-2022
14:02
linh
pham

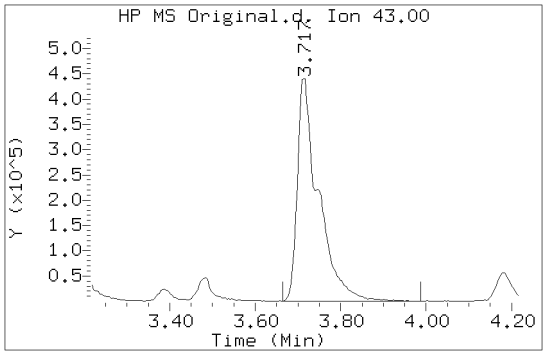


Vinyl Acetate (108-05-4)

Reason Code:

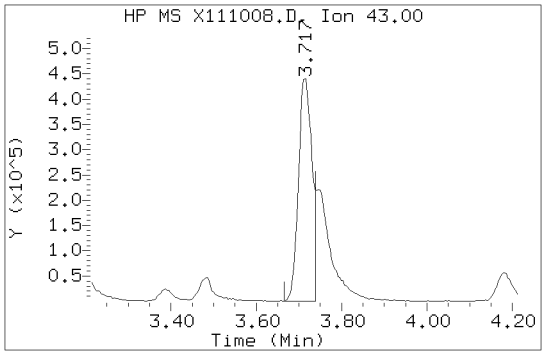
BEFORE

MASS
43
AREA
1521125
HEIGHT
439316
17-Nov-2022
13:58
linh
pham



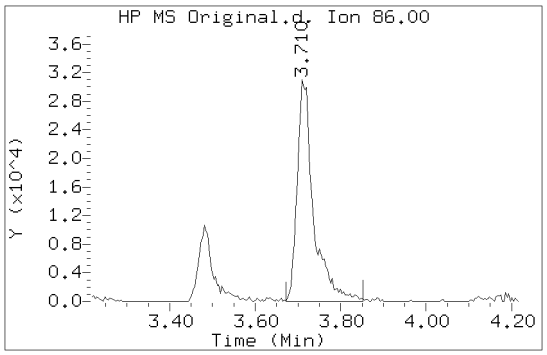
AFTER

MASS
43
AREA
1001604
HEIGHT
439316
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
86
AREA
83367
HEIGHT
31016
17-Nov-2022
13:58
linh
pham



AFTER

MASS
86
AREA
83367
HEIGHT
31016
17-Nov-2022
14:02
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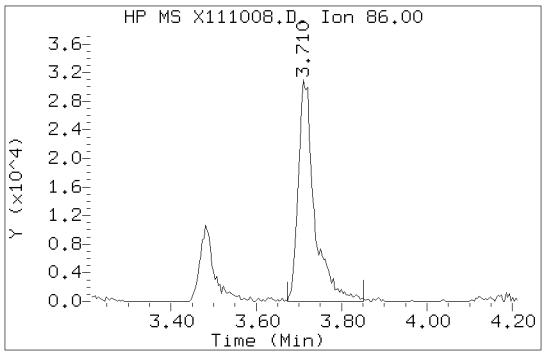
pham



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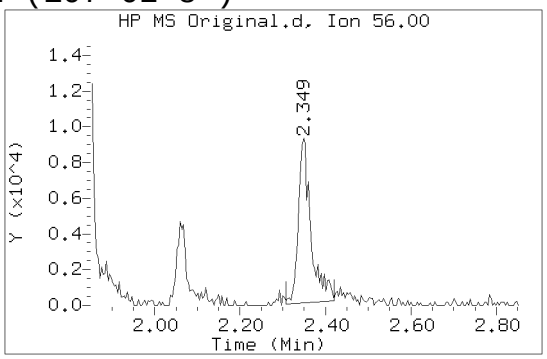
Inj Date : 10-NOV-2022 15:37
InstruID : voa10.i
LabSampID : VSTD050

Acrolein (107-02-8)

Reason Code:

BEFORE

MASS
56
AREA
19237
HEIGHT
9199
17-Nov-2022
13:58
linh
pham



AFTER

MASS
56
AREA
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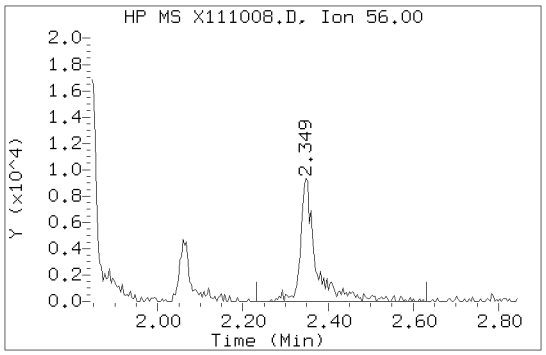
HEIGHT
9352
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
55
AREA
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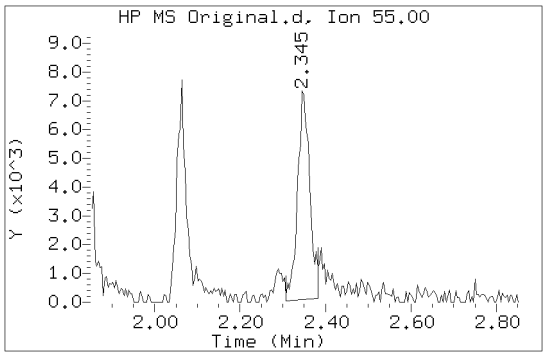
HEIGHT
7267
17-Nov-2022
13:58
linh
pham



AFTER

MASS
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AREA
14661
HEIGHT
7267
17-Nov-2022
14:02
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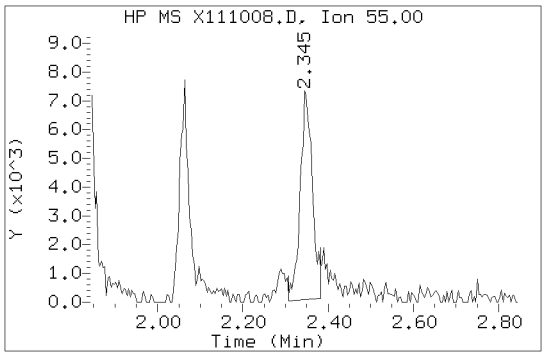
pham

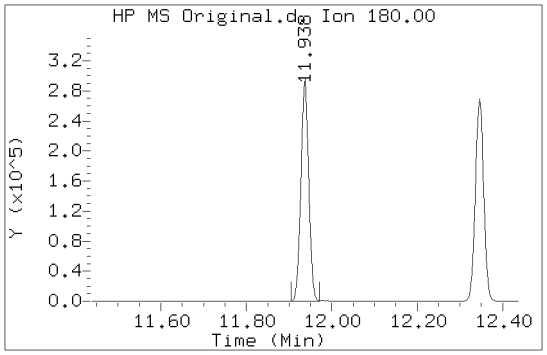


1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

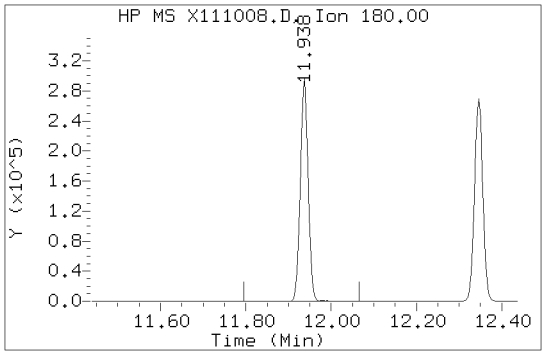
BEFORE

MASS
180
AREA
386180
HEIGHT
295691
17-Nov-2022
13:58
linh
pham



AFTER

MASS
180
AREA
388008
HEIGHT
295936
17-Nov-2022
14:02
linh
pham



BEFORE

MASS
182
AREA
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HEIGHT
291456
17-Nov-2022
13:58
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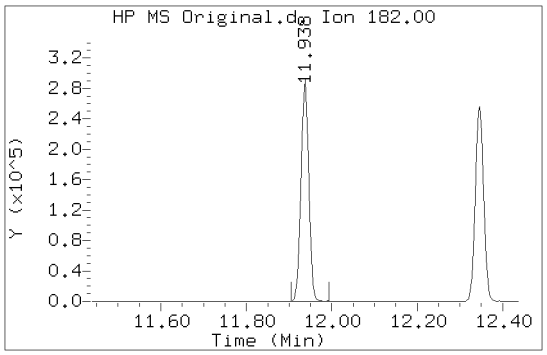
pham



AFTER

MASS
182
AREA
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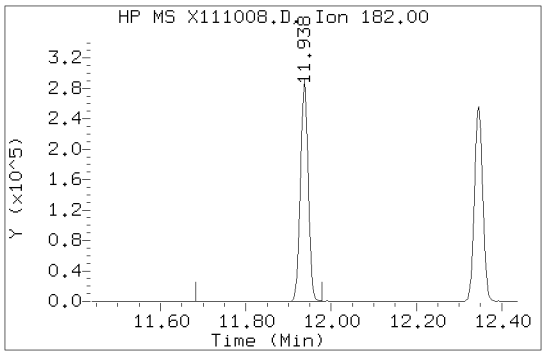
HEIGHT
291129
17-Nov-2022
14:02
linh
pham



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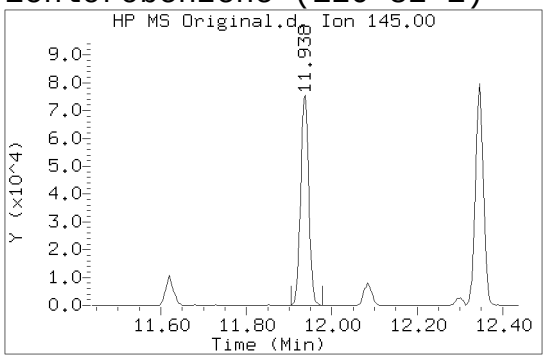
Inj Date : 10-NOV-2022 15:37
InstruID : voa10.i
LabSampID : VSTD050

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

BEFORE

MASS
145
AREA
103264
HEIGHT
75464
17-Nov-2022
13:58
linh
pham



AFTER

MASS
145
AREA
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HEIGHT
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17-Nov-2022
14:02
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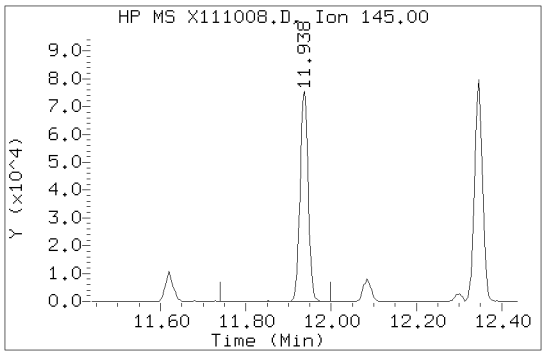
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111009.D Page 1
Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111009.D
Lab Smp Id: VSTD100 Client Smp ID: VSTD100
Inj Date : 10-NOV-2022 15:57
Operator : FT Inst ID: voa10.i
Smp Info : VSTD100;VSTD100;1;8;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:03 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 10 Calibration Sample, Level: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	499389	50.0000	
2 Dichlorodifluoromethane	85	1.231	1.231	(0.251)	493146	100.000	115.33
3 Chloromethane	50	1.370	1.370	(0.279)	487045	100.000	104.36
5 Vinyl Chloride	62	1.452	1.452	(0.295)	510141	100.000	110.06
6 Bromomethane	94	1.696	1.696	(0.345)	246344	100.000	117.76
7 Chloroethane	64	1.782	1.782	(0.363)	258742	100.000	96.92
8 Trichlorofluoromethane	101	1.992	1.992	(0.405)	691836	100.000	113.59
9 Acrolein	56	2.348	2.348	(0.478)	39803	200.000	196.33
10 Acetone	43	2.494	2.494	(0.507)	427642	200.000	215.10(A)
12 Isobutyl Alcohol	43	5.381	5.381	(1.095)	1613466	2000.00	2072.12
13 Acetonitrile	39	2.776	2.776	(0.565)	551887	1000.00	790.03
16 Acrylonitrile	53	3.143	3.143	(0.639)	376119	200.000	204.21
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	370701	100.000	100.21
15 Iodomethane	142	2.569	2.569	(0.523)	858110	200.000	204.15
17 Methylene Chloride	84	2.896	2.896	(0.589)	325588	100.000	98.13
18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	1315347	100.000	103.10
19 Carbon Disulfide	76	2.633	2.633	(0.536)	1659683	200.000	182.55
20 trans-1,2-Dichloroethene	96	3.177	3.177	(0.646)	398674	100.000	104.36
22 1,1-Dichloroethane	63	3.630	3.630	(0.738)	740355	100.000	100.23
24 2-Butanone	43	4.354	4.354	(0.886)	497438	200.000	192.09

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	453213	100.000	99.82
28 Chloroform	83	4.672	4.672 (0.950)	766630	100.000	93.44

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Report Date: 17-Nov-2022 14:03

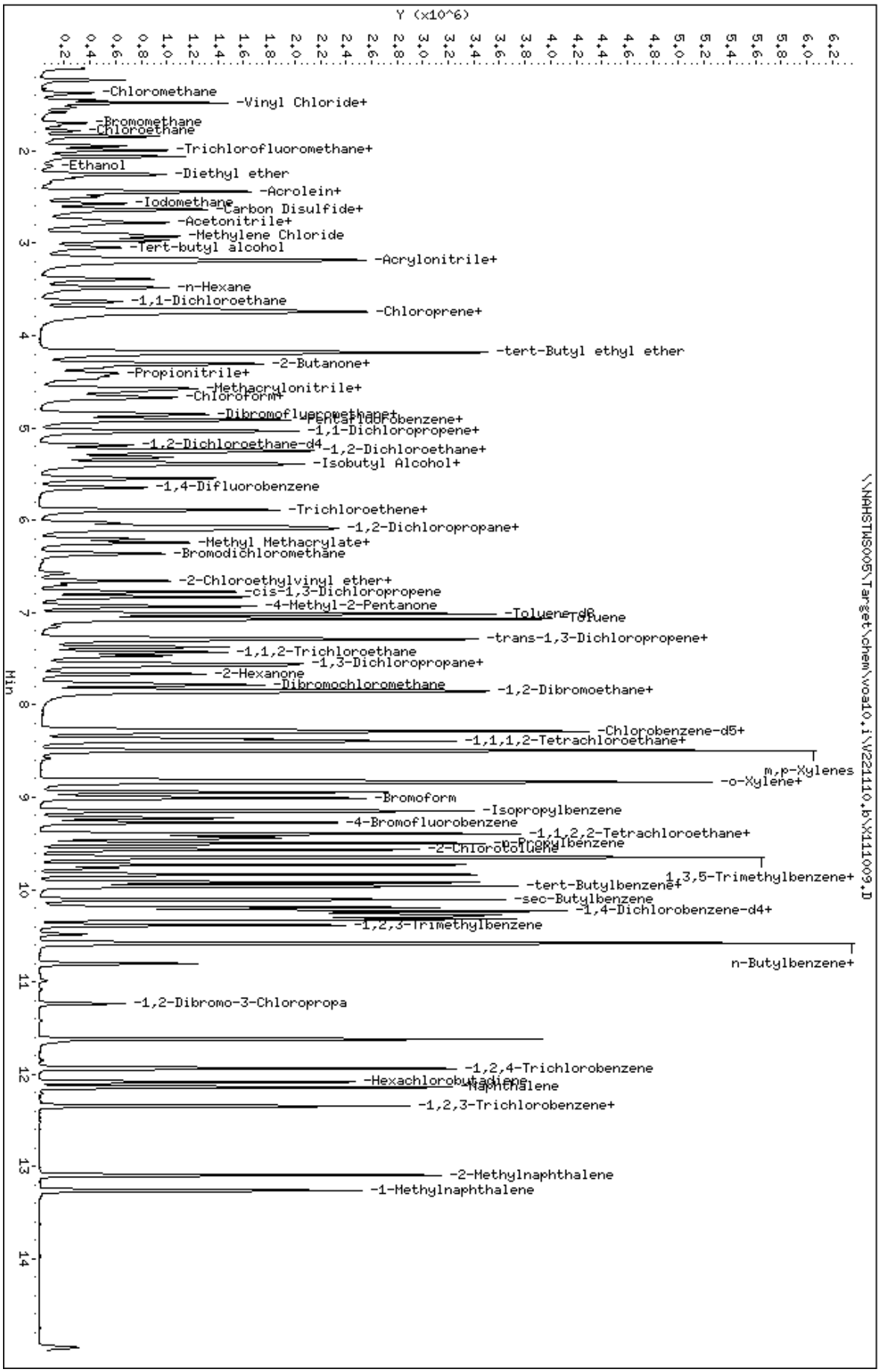
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
29	Bromochloromethane	128	4.567	4.567	(0.929)	218909	100.000	96.36
$ 30	Dibromofluoromethane	113	4.841	4.841	(0.985)	411721	100.000	97.57
31	1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	641651	100.000	97.34
32	1,1-Dichloropropene	75	5.036	5.036	(0.892)	589355	100.000	104.27
33	1,2-Dichloroethane	62	5.265	5.265	(0.933)	643185	100.000	94.90
34	Carbon Tetrachloride	117	5.032	5.032	(0.892)	534769	100.000	109.35(H)
$ 35	1,2-Dichloroethane-d4	65	5.190	5.190	(1.056)	509628	100.000	95.10
* 36	1,4-Difluorobenzene	114	5.643	5.643	(1.000)	733395	50.0000	
37	Benzene	78	5.242	5.242	(0.929)	1810196	100.000	96.95
38	Trichloroethene	130	5.887	5.887	(1.043)	475867	100.000	99.59
39	Bromodichloromethane	83	6.359	6.359	(1.127)	561647	100.000	96.44
42	1,2-Dichloropropane	63	6.097	6.097	(1.080)	497461	100.000	95.36
45	4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	1115061	200.000	191.29
46	cis-1,3-Dichloropropene	75	6.775	6.775	(1.201)	776960	100.000	99.82
* 47	Chlorobenzene-d5	117	8.267	8.267	(1.000)	629800	50.0000	
$ 48	Toluene-d8	98	7.012	7.012	(0.848)	1660983	100.000	104.34
50	Toluene	91	7.072	7.072	(0.855)	1904095	100.000	102.57
51	trans-1,3-Dichloropropene	75	7.274	7.274	(1.289)	679230	100.000	99.31
52	2-Hexanone	43	7.668	7.668	(0.927)	794391	200.000	193.31
53	1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	356678	100.000	96.01
54	1,3-Dichloropropane	76	7.574	7.574	(0.916)	731424	100.000	95.85
55	Dibromochloromethane	129	7.769	7.769	(0.940)	473870	100.000	97.76
56	Tetrachloroethene	164	7.555	7.555	(0.914)	405830	100.000	105.33
57	1,2-Dibromoethane	107	7.862	7.862	(0.951)	439477	100.000	96.63
59	Chlorobenzene	112	8.294	8.294	(1.003)	1193793	100.000	94.22
60	1,1,1,2-Tetrachloroethane	131	8.369	8.369	(1.012)	441104	100.000	97.17
61	Ethylbenzene	106	8.391	8.391	(1.015)	617447	100.000	99.50
62	m,p-Xylenes	106	8.496	8.496	(1.028)	1507175	200.000	197.28
63	o-Xylene	106	8.833	8.833	(1.068)	731364	100.000	95.84
64	Styrene	104	8.841	8.841	(1.069)	1341502	100.000	96.80
66	Bromoform	173	8.995	8.995	(1.088)	364147	100.000	98.04
67	Isopropylbenzene	105	9.148	9.148	(1.107)	1886431	100.000	99.63
68	1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	665348	100.000	100.23
$ 69	4-Bromofluorobenzene	95	9.272	9.272	(1.122)	619939	100.000	98.01
* 70	1,4-Dichlorobenzene-d4	152	10.254	10.254	(1.000)	405207	50.0000	
75	1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	1690828	100.000	102.43
78	tert-Butylbenzene	119	9.924	9.924	(0.968)	1423738	100.000	100.00
79	1,2,4-Trimethylbenzene	105	9.965	9.965	(0.972)	1775563	100.000	98.99
81	sec-Butylbenzene	105	10.108	10.108	(0.986)	2082077	100.000	104.05
87	n-Butylbenzene	91	10.577	10.577	(1.031)	1811269	100.000	103.78
73	n-Propylbenzene	91	9.497	9.497	(0.926)	2280734	100.000	103.18
71	1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	789546	100.000	91.66
83	1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	1126165	100.000	90.99
84	1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	1165737	100.000	98.69
88	1,2-Dichlorobenzene	146	10.584	10.584	(1.032)	1127669	100.000	99.82
89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	122735	100.000	97.97
90	1,2,4-Trichlorobenzene	180	11.937	11.937	(1.164)	886028	100.000	103.22(M)
92	Naphthalene	128	12.143	12.143	(1.184)	2171858	100.000	95.29
136	n-Hexane	57	3.480	3.480	(0.708)	567026	100.000	108.56
147	Methylcyclohexane	55	6.067	6.067	(1.075)	663248	100.000	98.69
141	Cyclohexane	56	4.916	4.916	(1.000)	682169	100.000	100.11
138	Freon TF	101	2.449	2.449	(0.498)	373490	100.000	100.13

146	Methyl Acetate	43	2.813	2.813 (0.572)	321439	100.000	78.57
21	Vinyl Acetate	43	3.713	3.713 (0.755)	2037936	200.000	201.21(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	616947	100.000	102.06
	44 Dibromomethane	93	6.202	6.202	(1.099)	278317	100.000	93.19
	91 Hexachlorobutadiene	225	12.087	12.087	(1.179)	444581	100.000	100.23
	74 Bromobenzene	156	9.399	9.399	(0.917)	587054	100.000	94.92
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	1413135	100.000	98.04
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	1679213	100.000	97.29
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	1901368	100.000	104.46
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	812095	100.000	102.81
	148 tert-Butyl Alcohol	59	3.045	3.045	(0.620)	898030	2000.00	1435.51
	142 Tetrahydrofuran	42	4.646	4.646	(0.945)	188005	200.000	183.48
M	94 1,2-Dichloroethylene (total)	96				851887	200.000	
M	95 Xylenes (total)	106				2238539	300.000	

QC Flag Legend

A - Target compound detected but, quantitated amount
    exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.


Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Bromomethane
-Chloroethane
-Trichlorofluoromethane+
-Ethanol
-Diethyl ether
-Acrolein+
-Iodomethane
-Carbon Disulfide+
-Acetonitrile+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-n-Hexane
-1,1-Dichloroethane
-Chloroprene+
-tert-Butyl ethyl ether
-2-Butanone+
-Propionitrile+
-Methacrylonitrile+
-Chloroform+
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane-d4
-1,2-Dichloroethane+
-Isobutyl Alcohol+
-1,4-Difluorobenzene
-Trichloroethene+
-1,2-Dichloropropane+
-Methyl Methacrylate+
-Bromodichloromethane
-2-Chloroethylvinyl ether+
-cis-1,3-Dichloropropene
-4-Methyl-2-Pentanone
-Toluene-d8
Toluene
-trans-1,3-Dichloropropene+
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane+
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
m,p-Xylenes
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene
-2-Chlorotoluene
1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
-1,2,3-Trimethylbenzene
n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene+
-2-Methylnaphthalene
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Operator: FT
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Page 1

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Inj Date : 10-NOV-2022 15:57
InstruID : voa10.i
LabSampID : VSTD100

Vinyl Acetate (108-05-4)

Reason Code:

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17-Nov-2022
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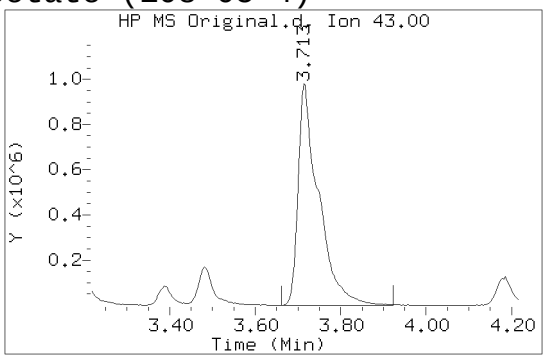

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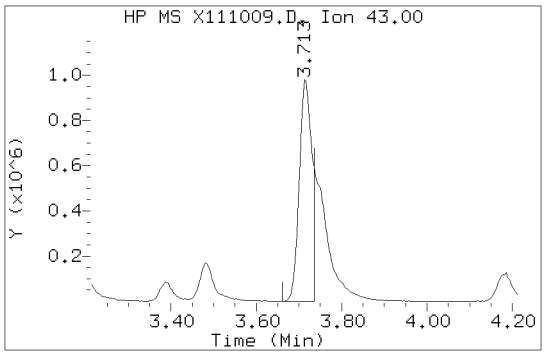

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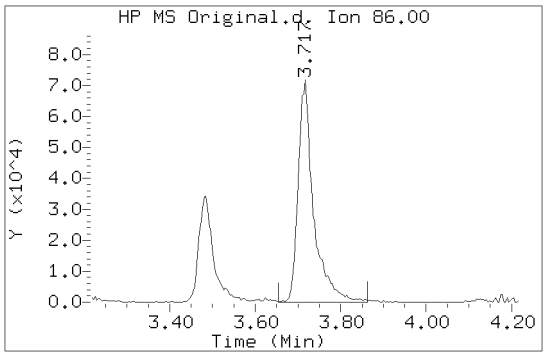

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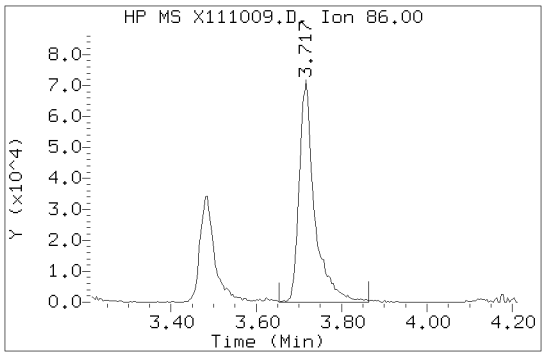

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

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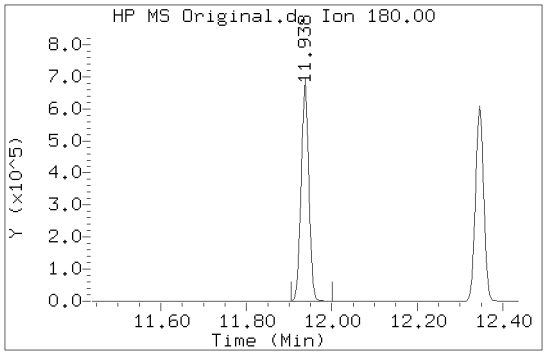

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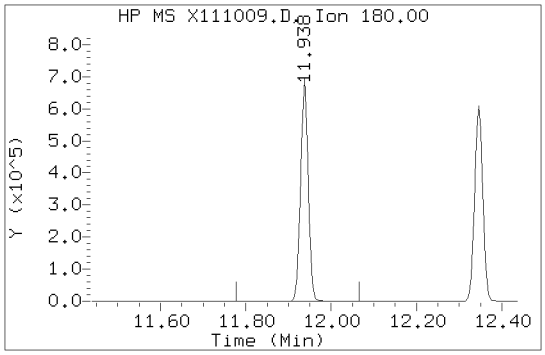

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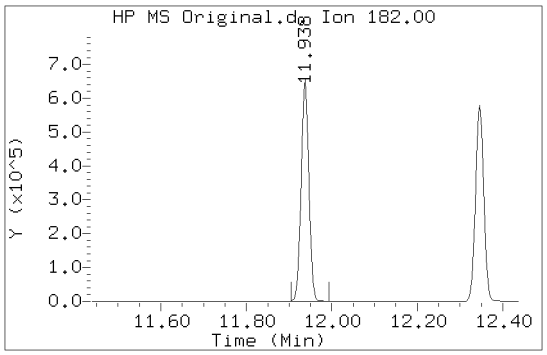

AFTER

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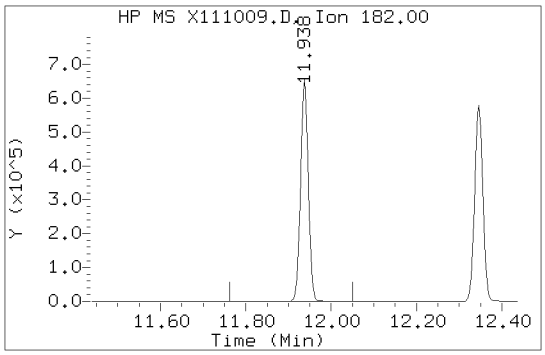

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InstruID : voa10.i
LabSampID : VSTD100

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

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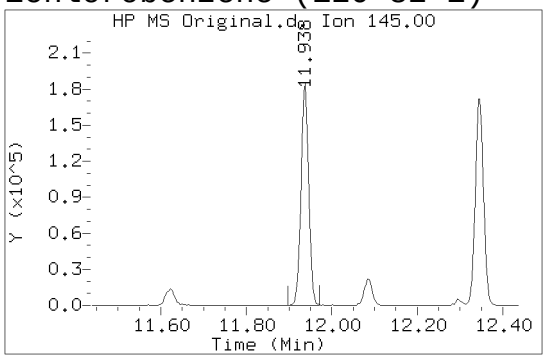

AFTER

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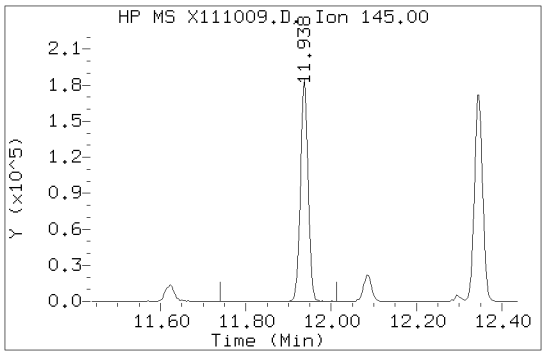

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Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

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Inj Date : 10-NOV-2022 16:17
Operator : FT Inst ID: voa10.i
Smp Info : VSTD150;VSTD150;1;9;
Misc Info : V10;WATER;0;1;
Comment :
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Cal Date : 10-NOV-2022 15:57 Cal File: X111009.D
Als bottle: 11 Calibration Sample, Level: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	502441	50.0000	
2 Dichlorodifluoromethane	85	1.235	1.235	(0.251)	767641	150.000	178.44
3 Chloromethane	50	1.370	1.370	(0.279)	724462	150.000	154.29
5 Vinyl Chloride	62	1.452	1.452	(0.295)	808031	150.000	173.28
6 Bromomethane	94	1.692	1.692	(0.344)	337683	150.000	160.44
7 Chloroethane	64	1.778	1.778	(0.362)	482707	150.000	179.71
8 Trichlorofluoromethane	101	1.992	1.992	(0.405)	1028879	150.000	167.90
9 Acrolein	56	2.348	2.348	(0.478)	58475	300.000	283.71
10 Acetone	43	2.494	2.494	(0.507)	606017	300.000	305.19(A)
12 Isobutyl Alcohol	43	5.377	5.377	(1.094)	2527581	3000.00	3226.37
13 Acetonitrile	39	2.776	2.776	(0.565)	1005061	1500.00	1430.02
16 Acrylonitrile	53	3.150	3.150	(0.641)	477766	300.000	257.82
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	574698	150.000	122.73
15 Iodomethane	142	2.569	2.569	(0.523)	1351419	300.000	303.45
17 Methylene Chloride	84	2.896	2.896	(0.589)	491109	150.000	140.63
18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	1762035	150.000	137.27
19 Carbon Disulfide	76	2.633	2.633	(0.536)	3203085	300.000	319.66
20 trans-1,2-Dichloroethene	96	3.177	3.177	(0.646)	513342	150.000	133.56
22 1,1-Dichloroethane	63	3.630	3.630	(0.738)	1127330	150.000	142.74
24 2-Butanone	43	4.354	4.354	(0.886)	759168	300.000	291.38

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	634459	150.000	138.89
28 Chloroform	83	4.672	4.672 (0.950)	1101203	150.000	133.41

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Report Date: 17-Nov-2022 14:03

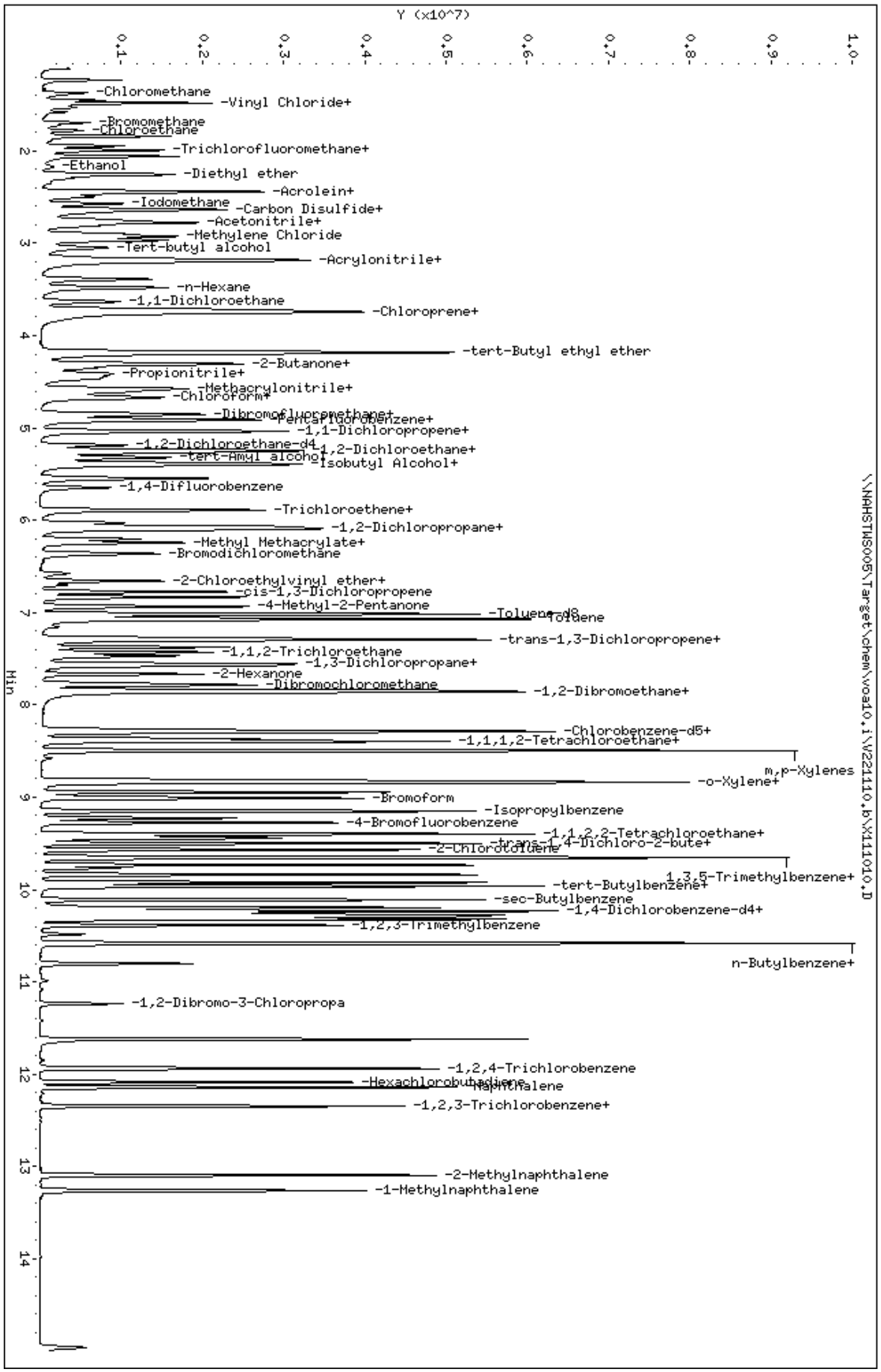
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
29	Bromochloromethane	128	4.571	4.571	(0.930)	311646	150.000	136.35
$ 30	Dibromofluoromethane	113	4.841	4.841	(0.985)	604858	150.000	142.48
31	1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	965053	150.000	145.52
32	1,1-Dichloropropene	75	5.036	5.036	(0.892)	868970	150.000	153.52
33	1,2-Dichloroethane	62	5.268	5.268	(0.933)	933241	150.000	137.49
34	Carbon Tetrachloride	117	5.032	5.032	(0.891)	806141	150.000	164.61(H)
$ 35	1,2-Dichloroethane-d4	65	5.190	5.190	(1.056)	759036	150.000	140.79
* 36	1,4-Difluorobenzene	114	5.647	5.647	(1.000)	734478	50.0000	
37	Benzene	78	5.246	5.246	(0.929)	2651104	150.000	141.79
38	Trichloroethene	130	5.891	5.891	(1.043)	697919	150.000	145.86
39	Bromodichloromethane	83	6.359	6.359	(1.126)	833857	150.000	142.97
42	1,2-Dichloropropane	63	6.097	6.097	(1.080)	719753	150.000	137.77
45	4-Methyl-2-Pentanone	43	6.933	6.933	(0.838)	1734551	300.000	291.92
46	cis-1,3-Dichloropropene	75	6.775	6.775	(1.200)	1155882	150.000	148.29
* 47	Chlorobenzene-d5	117	8.271	8.271	(1.000)	638606	50.0000	
$ 48	Toluene-d8	98	7.012	7.012	(0.848)	2448194	150.000	151.54
50	Toluene	91	7.072	7.072	(0.855)	2788221	150.000	148.13
51	trans-1,3-Dichloropropene	75	7.274	7.274	(1.288)	1025454	150.000	149.71
52	2-Hexanone	43	7.668	7.668	(0.927)	1204655	300.000	288.25
53	1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	532549	150.000	141.38
54	1,3-Dichloropropane	76	7.574	7.574	(0.916)	1088105	150.000	140.62
55	Dibromochloromethane	129	7.769	7.769	(0.939)	722625	150.000	147.02
56	Tetrachloroethene	164	7.555	7.555	(0.913)	612788	150.000	156.85
57	1,2-Dibromoethane	107	7.863	7.863	(0.951)	641750	150.000	139.16
59	Chlorobenzene	112	8.294	8.294	(1.003)	1789631	150.000	139.31
60	1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.011)	667699	150.000	145.06
61	Ethylbenzene	106	8.395	8.395	(1.015)	921976	150.000	146.52
62	m,p-Xylenes	106	8.496	8.496	(1.027)	2298494	300.000	296.71
63	o-Xylene	106	8.833	8.833	(1.068)	1123364	150.000	145.19
64	Styrene	104	8.845	8.845	(1.069)	2053987	150.000	146.16
66	Bromoform	173	8.995	8.995	(1.087)	577658	150.000	152.72
67	Isopropylbenzene	105	9.148	9.148	(1.106)	2950016	150.000	153.66
68	1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	1017292	150.000	148.71
$ 69	4-Bromofluorobenzene	95	9.276	9.276	(1.121)	958342	150.000	148.92
* 70	1,4-Dichlorobenzene-d4	152	10.254	10.254	(1.000)	417807	50.0000	
75	1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	2644244	150.000	155.37
78	tert-Butylbenzene	119	9.924	9.924	(0.968)	2265923	150.000	154.36
79	1,2,4-Trimethylbenzene	105	9.965	9.965	(0.972)	2758855	150.000	149.17
81	sec-Butylbenzene	105	10.112	10.112	(0.986)	3280150	150.000	158.98
87	n-Butylbenzene	91	10.577	10.577	(1.031)	2830071	150.000	157.26
73	n-Propylbenzene	91	9.501	9.501	(0.927)	3594858	150.000	157.73
71	1,2,3-Trichloropropane	75	9.437	9.437	(0.920)	1205805	150.000	135.76
83	1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	1736562	150.000	136.09
84	1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	1798647	150.000	147.39
88	1,2-Dichlorobenzene	146	10.584	10.584	(1.032)	1745661	150.000	149.87
89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	191143	150.000	147.98
90	1,2,4-Trichlorobenzene	180	11.937	11.937	(1.164)	1345565	150.000	152.00(M)
92	Naphthalene	128	12.143	12.143	(1.184)	3356224	150.000	142.82
136	n-Hexane	57	3.480	3.480	(0.708)	876143	150.000	166.72
147	Methylcyclohexane	55	6.067	6.067	(1.074)	992748	150.000	147.50(A)
141	Cyclohexane	56	4.912	4.912	(0.999)	1051282	150.000	91.48
138	Freon TF	101	2.449	2.449	(0.498)	604799	150.000	95.73

146 Methyl Acetate	43	2.813	2.813 (0.572)	635248	150.000	154.33
21 Vinyl Acetate	43	3.717	3.717 (0.756)	3177509	300.000	311.81(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	26 2,2-Dichloropropane	77	4.309	4.309	(0.876)	905931	150.000	148.96
	44 Dibromomethane	93	6.202	6.202	(1.098)	411781	150.000	137.68
	91 Hexachlorobutadiene	225	12.087	12.087	(1.179)	679583	150.000	111.48
	74 Bromobenzene	156	9.399	9.399	(0.917)	908115	150.000	142.41
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	2200194	150.000	147.32
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	2612010	150.000	146.77
	82 p-Isopropyltoluene	119	10.235	10.235	(0.998)	2955996	150.000	157.50
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	1242539	150.000	152.68
	148 tert-Butyl Alcohol	59	3.049	3.049	(0.620)	1214272	3000.00	1929.23
	142 Tetrahydrofuran	42	4.650	4.650	(0.946)	277695	300.000	269.36
M	94 1,2-Dichloroethylene (total)	96				1147801	300.000	
M	95 Xylenes (total)	106				3421858	450.000	

QC Flag Legend

A - Target compound detected but, quantitated amount
    exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Client ID: VSTD150
Sample Info: VSTD150;VSTD150;1;9;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10,i
Operator: FT
Column diameter: 0.18

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Inj Date : 10-NOV-2022 16:17
InstruID : voa10.i
LabSampID : VSTD150

Vinyl Acetate (108-05-4)

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17-Nov-2022
13:58
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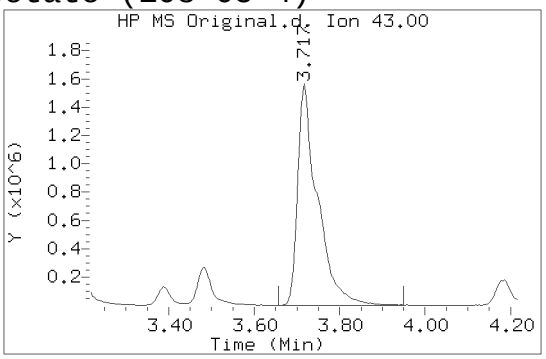

AFTER

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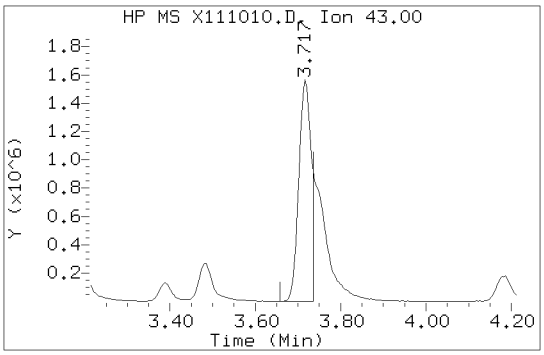

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BEFORE

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17-Nov-2022
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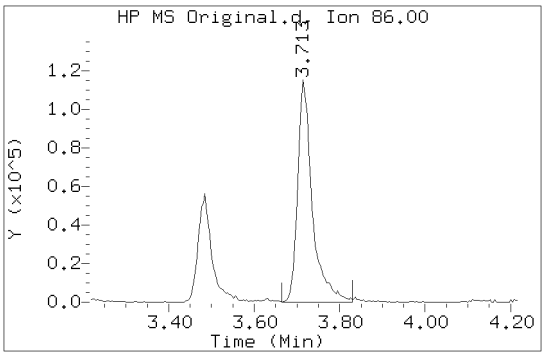

AFTER

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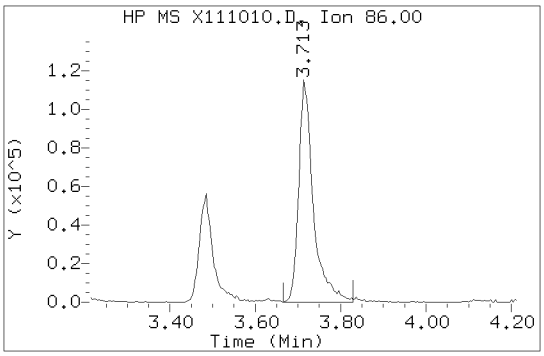

Reason Code:

1,2,4-Trichlorobenzene (120-82-1)

BEFORE

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17-Nov-2022
13:58
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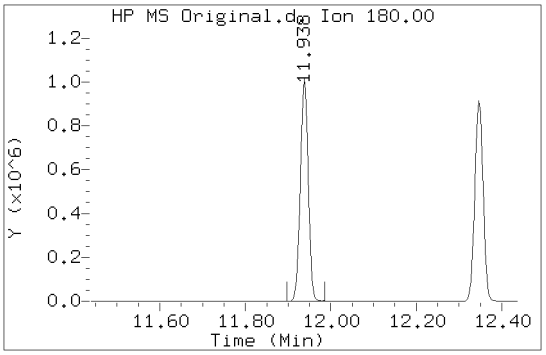

AFTER

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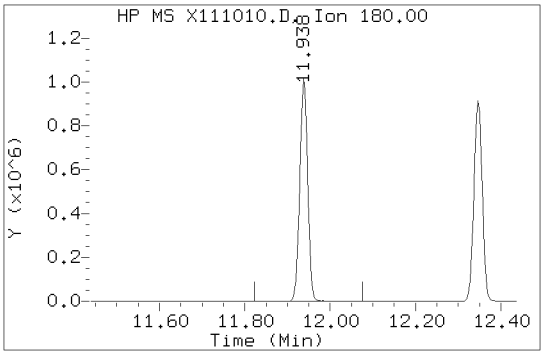

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BEFORE

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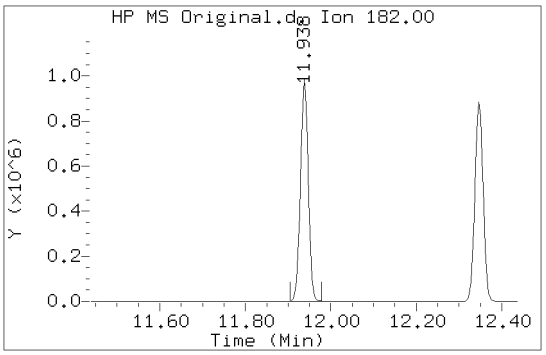

AFTER

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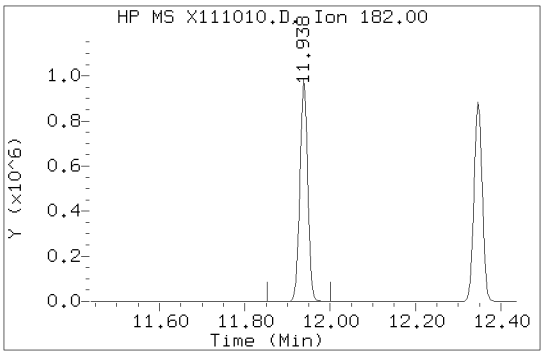

Reason Code:

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Inj Date : 10-NOV-2022 16:17
InstruID : voa10.i
LabSampID : VSTD150

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

BEFORE

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17-Nov-2022
13:58
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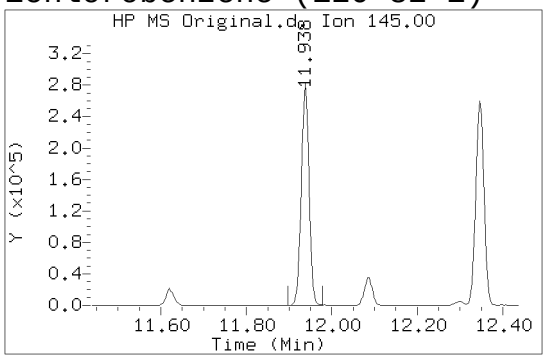
pham



AFTER

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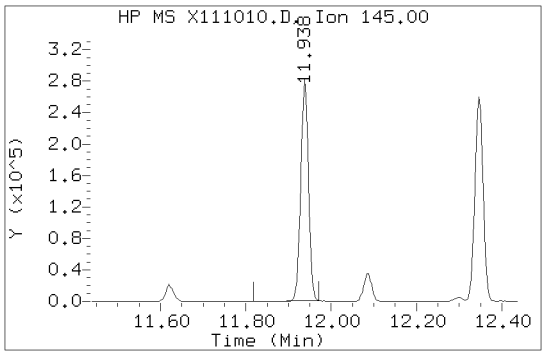

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111011.D Page 1
Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111011.D
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Inj Date : 10-NOV-2022 16:38
Operator : FT Inst ID: voa10.i
Smp Info : VSTD200;VSTD200;1;10;
Misc Info : V10;WATER;0;1;
Comment :
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Meth Date : 17-Nov-2022 14:03 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 16:17 Cal File: X111010.D
Als bottle: 12 Calibration Sample, Level: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	578375	50.0000	
2 Dichlorodifluoromethane	85	1.231	1.231	(0.250)	1054199	200.000	212.87(A)
3 Chloromethane	50	1.370	1.370	(0.279)	1116328	200.000	206.53(A)
5 Vinyl Chloride	62	1.452	1.452	(0.295)	1135336	200.000	211.51(A)
6 Bromomethane	94	1.688	1.688	(0.344)	430541	200.000	177.71
7 Chloroethane	64	1.775	1.775	(0.361)	710613	200.000	229.83(A)
8 Trichlorofluoromethane	101	1.992	1.992	(0.405)	1523272	200.000	215.95(A)
9 Acrolein	56	2.352	2.352	(0.478)	98180	400.000	406.54(A)
10 Acetone	43	2.498	2.498	(0.508)	877600	400.000	385.34(A)
12 Isobutyl Alcohol	43	5.381	5.381	(1.095)	4085486	4000.00	4530.31(A)
13 Acetonitrile	39	2.775	2.775	(0.565)	1550360	2000.00	1916.27
16 Acrylonitrile	53	3.150	3.150	(0.641)	813207	400.000	381.23
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	853362	200.000	124.22
15 Iodomethane	142	2.569	2.569	(0.523)	2149405	400.000	397.65
17 Methylene Chloride	84	2.899	2.899	(0.590)	904304	200.000	203.12(A)
18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	3067051	200.000	207.58(A)
19 Carbon Disulfide	76	2.633	2.633	(0.536)	4808317	400.000	391.12
20 trans-1,2-Dichloroethene	96	3.177	3.177	(0.646)	855837	200.000	193.44
22 1,1-Dichloroethane	63	3.630	3.630	(0.738)	1726890	200.000	178.13
24 2-Butanone	43	4.357	4.357	(0.886)	1124051	400.000	374.78

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	953889	200.000	181.40
28 Chloroform	83	4.676	4.676 (0.951)	1705859	200.000	179.53

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111011.D Page 2
Report Date: 17-Nov-2022 14:03

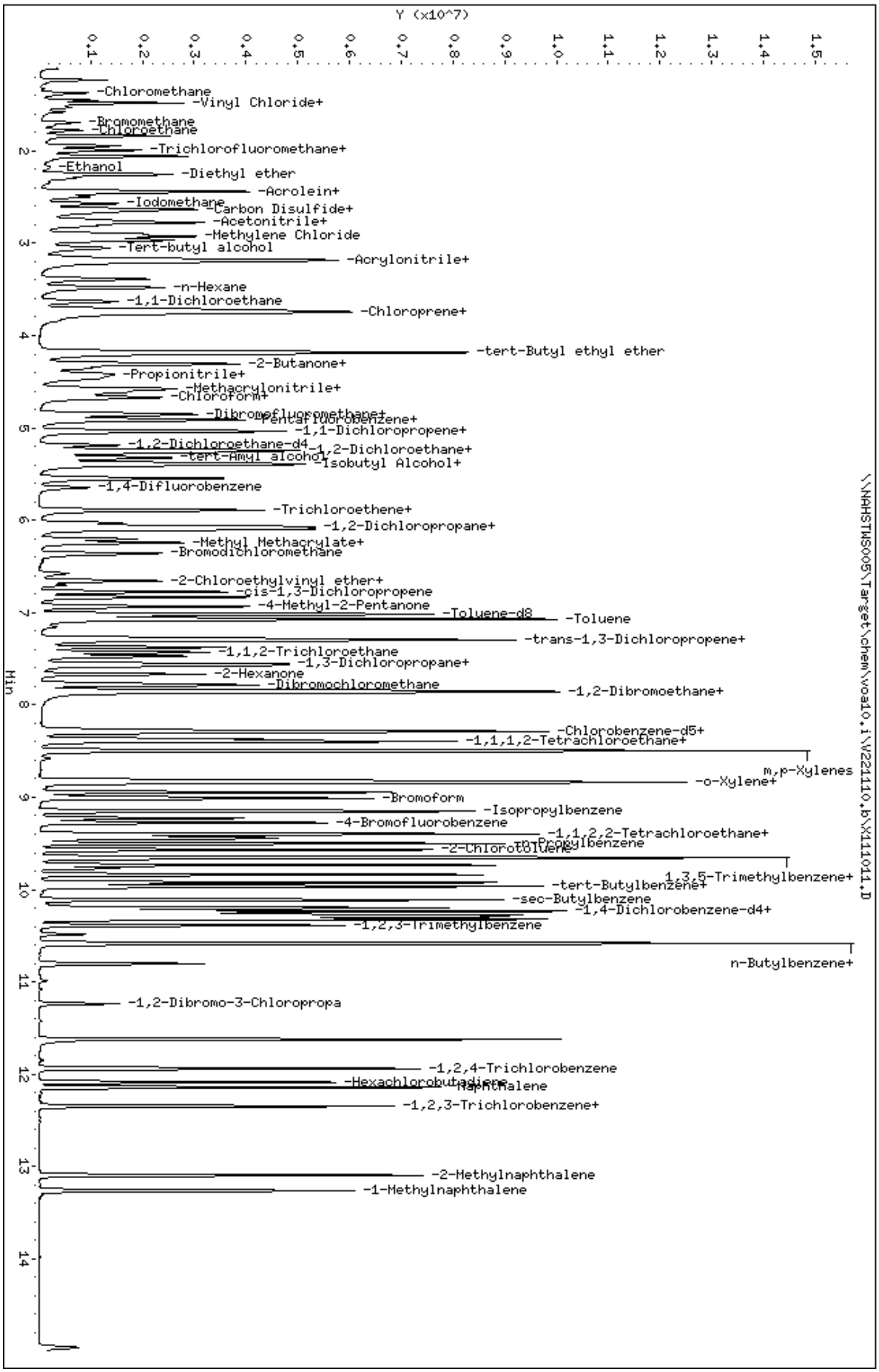
		QUANT SIG					AMOUNTS	
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.571	4.571	(0.930)	462663	200.000	175.85
$	30 Dibromofluoromethane	113	4.845	4.845	(0.986)	879397	200.000	179.95
	31 1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	1503530	200.000	196.95
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	1342655	200.000	208.97(A)
	33 1,2-Dichloroethane	62	5.265	5.265	(0.932)	1458265	200.000	189.27
	34 Carbon Tetrachloride	117	5.032	5.032	(0.891)	1283239	200.000	230.84(AH)
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	1103991	200.000	177.89
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	833712	50.0000	
	37 Benzene	78	5.246	5.246	(0.929)	4043886	200.000	190.53
	38 Trichloroethene	130	5.891	5.891	(1.043)	1040829	200.000	191.63
	39 Bromodichloromethane	83	6.359	6.359	(1.126)	1277226	200.000	192.92
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	1102607	200.000	185.93
	45 4-Methyl-2-Pentanone	43	6.933	6.933	(0.838)	2694851	400.000	411.21(A)
	46 cis-1,3-Dichloropropene	75	6.775	6.775	(1.200)	1730594	200.000	195.59
*	47 Chlorobenzene-d5	117	8.271	8.271	(1.000)	702323	50.0000	
$	48 Toluene-d8	98	7.015	7.015	(0.848)	3513848	200.000	197.69
	50 Toluene	91	7.071	7.071	(0.855)	4349141	200.000	210.10(A)
	51 trans-1,3-Dichloropropene	75	7.274	7.274	(1.288)	1560741	200.000	200.73(A)
	52 2-Hexanone	43	7.667	7.667	(0.927)	1898739	400.000	412.38(A)
	53 1,1,2-Trichloroethane	83	7.431	7.431	(0.898)	809280	200.000	195.36
	54 1,3-Dichloropropane	76	7.577	7.577	(0.916)	1685366	200.000	198.05
	55 Dibromochloromethane	129	7.769	7.769	(0.939)	1115047	200.000	206.28(A)
	56 Tetrachloroethene	164	7.555	7.555	(0.913)	927041	200.000	215.76(A)
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	974601	200.000	192.17
	59 Chlorobenzene	112	8.293	8.293	(1.003)	2775736	200.000	196.47
	60 1,1,1,2-Tetrachloroethane	131	8.368	8.368	(1.012)	1040631	200.000	205.57(A)
	61 Ethylbenzene	106	8.395	8.395	(1.015)	1467450	200.000	212.06(A)
	62 m,p-Xylenes	106	8.496	8.496	(1.027)	3632932	400.000	426.43(A)
	63 o-Xylene	106	8.833	8.833	(1.068)	1758147	200.000	206.62(A)
	64 Styrene	104	8.845	8.845	(1.069)	3240040	200.000	209.65(A)
	66 Bromoform	173	8.994	8.994	(1.087)	925985	200.000	222.07(A)
	67 Isopropylbenzene	105	9.148	9.148	(1.106)	4720146	200.000	223.56(A)
	68 1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	1597328	200.000	201.15(A)
$	69 4-Bromofluorobenzene	95	9.276	9.276	(1.121)	1437920	200.000	202.83(A)
*	70 1,4-Dichlorobenzene-d4	152	10.254	10.254	(1.000)	485171	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.650	9.650	(0.941)	4235491	200.000	214.31(A)
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	3575323	200.000	209.74(A)
	79 1,2,4-Trimethylbenzene	105	9.965	9.965	(0.972)	4452024	200.000	207.30(A)
	81 sec-Butylbenzene	105	10.112	10.112	(0.986)	5184693	200.000	216.40(A)
	87 n-Butylbenzene	91	10.580	10.580	(1.032)	4491729	200.000	214.94(A)
	73 n-Propylbenzene	91	9.501	9.501	(0.927)	5780348	200.000	218.41(A)
	71 1,2,3-Trichloropropane	75	9.437	9.437	(0.920)	1910941	200.000	185.28
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	2762793	200.000	186.45
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	2882615	200.000	203.20(A)
	88 1,2-Dichlorobenzene	146	10.588	10.588	(1.033)	2713582	200.000	200.63(A)
	89 1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	288259	200.000	192.18
	90 1,2,4-Trichlorobenzene	180	11.937	11.937	(1.164)	2033627	200.000	197.82(M)
	92 Naphthalene	128	12.143	12.143	(1.184)	5103381	200.000	187.01
	136 n-Hexane	57	3.480	3.480	(0.708)	1334619	200.000	220.62(A)
	147 Methylcyclohexane	55	6.067	6.067	(1.074)	1653447	200.000	216.42(A)
	141 Cyclohexane	56	4.912	4.912	(0.999)	1639543	200.000	37.92
	138 Freon TF	101	2.449	2.449	(0.498)	895445	200.000	59.15

146 Methyl Acetate	43	2.813	2.813 (0.572)	972757	200.000	205.30(A)
21 Vinyl Acetate	43	3.716	3.716 (0.756)	4793860	400.000	408.67(AM)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	1376412	200.000	196.61
	44 Dibromomethane	93	6.205	6.205	(1.099)	617808	200.000	181.98
	91 Hexachlorobutadiene	225	12.087	12.087	(1.179)	1010082	200.000	101.46
	74 Bromobenzene	156	9.399	9.399	(0.917)	1437533	200.000	194.13
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	3544893	200.000	203.86(A)
	77 4-Chlorotoluene	91	9.662	9.662	(0.942)	4187799	200.000	202.65(A)
	82 p-Isopropyltoluene	119	10.235	10.235	(0.998)	4756246	200.000	218.24(A)
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	1863854	200.000	197.31
	148 tert-Butyl Alcohol	59	3.049	3.049	(0.620)	2080511	4000.00	2871.54
	142 Tetrahydrofuran	42	4.650	4.650	(0.946)	482178	400.000	406.30(A)
M	94 1,2-Dichloroethylene (total)	96				1809726	400.000	
M	95 Xylenes (total)	106				5391079	600.000	

QC Flag Legend

A - Target compound detected but, quantitated amount
    exceeded maximum amount.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Client ID: VSTD200
Sample Info: VSTD200;VSTD200;1;10;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: FT
Column diameter: 0.18

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Inj Date : 10-NOV-2022 16:38
InstruID : voa10.i
LabSampID : VSTD200

Vinyl Acetate (108-05-4)

Reason Code:

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43
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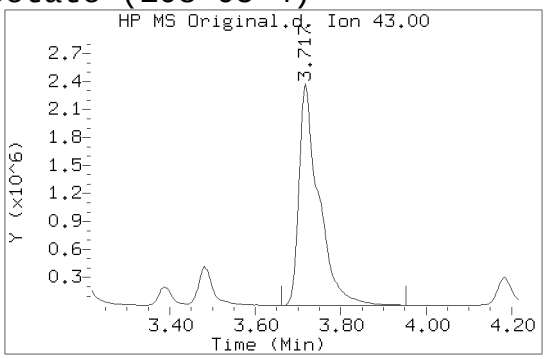
HEIGHT
2375052
17-Nov-2022
13:58
linh
pham



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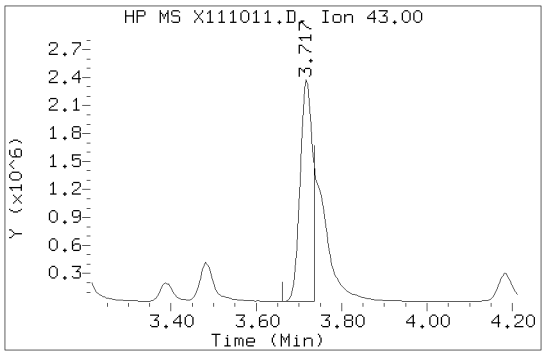

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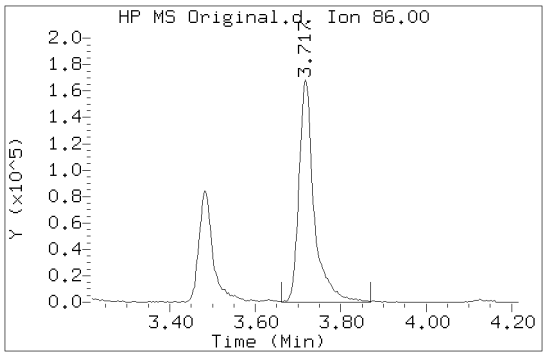

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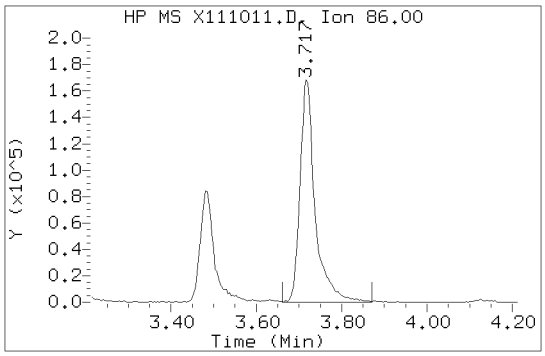

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

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HEIGHT
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17-Nov-2022
13:58
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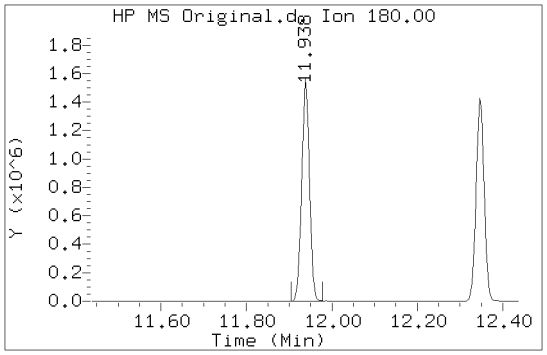

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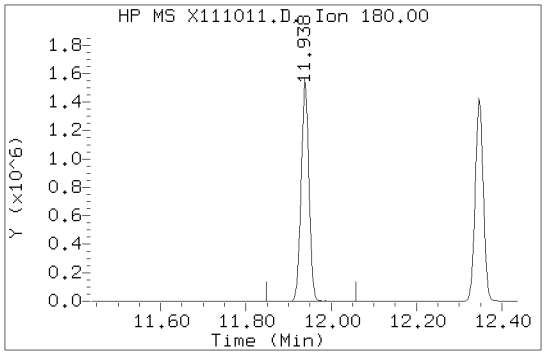

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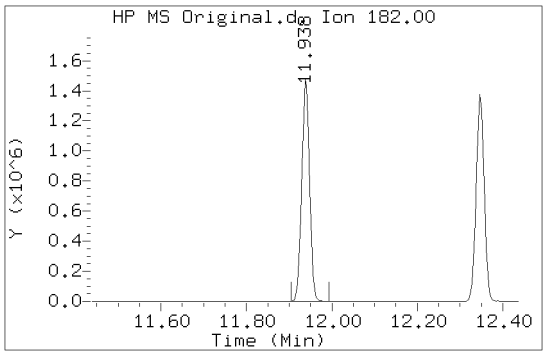

AFTER
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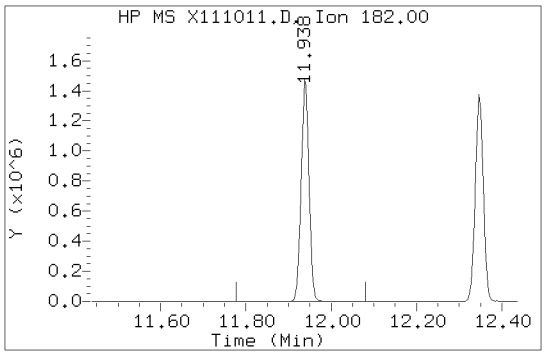

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Inj Date : 10-NOV-2022 16:38
InstruID : voa10.i
LabSampID : VSTD200

1,2,4-Trichlorobenzene (120-82-1)

Reason Code:

BEFORE

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17-Nov-2022
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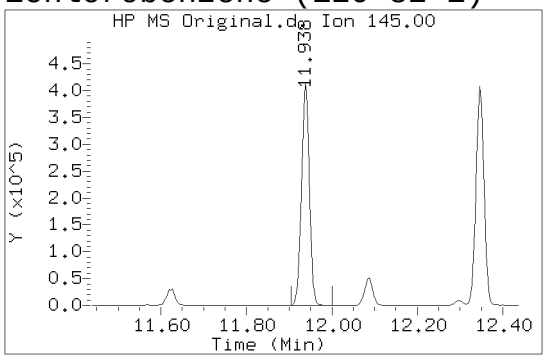

AFTER

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17-Nov-2022
14:02
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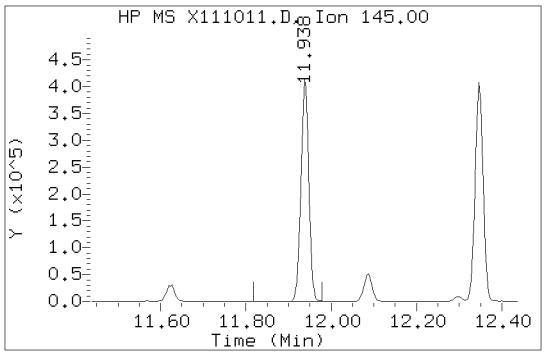

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111014.D Page 1
Report Date: 17-Nov-2022 14:03

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111014.D
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Inj Date : 10-NOV-2022 17:39
Operator : FT Inst ID: voa10.i
Smp Info : VSTD050;VSTD050;2;;ICV
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\8260C.m
Meth Date : 17-Nov-2022 14:03 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 16:38 Cal File: X111011.D
Als bottle: 15 QC Sample: METHSPIKE
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 00000008260V10.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	529361	50.0000	
2 Dichlorodifluoromethane	85	1.231	1.231	(0.251)	201113	44.3720	44.37
3 Chloromethane	50	1.370	1.370	(0.279)	234355	47.3740	47.37
5 Vinyl Chloride	62	1.452	1.452	(0.296)	230975	47.0143	47.01
6 Bromomethane	94	1.700	1.688	(0.346)	121278	54.6937	54.69
7 Chloroethane	64	1.786	1.775	(0.364)	132209	46.7199	46.71
8 Trichlorofluoromethane	101	1.992	1.992	(0.406)	280700	43.4798	43.47
9 Acrolein	56	2.348	2.352	(0.478)	20388	95.3592	95.35(M)
10 Acetone	43	2.491	2.498	(0.507)	189777	86.8898	86.88
12 Isobutyl Alcohol	43	5.377	5.381	(1.095)	796871	965.451	965.45
13 Acetonitrile	39	2.779	2.775	(0.566)	308353	416.420	416.42
16 Acrylonitrile	53	3.143	3.150	(0.640)	161106	82.5194	82.51
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	137019	43.0065	43.00
15 Iodomethane	142	2.569	2.569	(0.523)	338259	82.2269	82.22(M)
17 Methylene Chloride	84	2.899	2.899	(0.590)	167395	48.4615	48.46
18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	629658	46.5615	46.56
19 Carbon Disulfide	76	2.633	2.633	(0.536)	799886	86.8783	86.87
20 trans-1,2-Dichloroethene	96	3.177	3.177	(0.647)	164196	40.5506	40.55
22 1,1-Dichloroethane	63	3.630	3.630	(0.739)	328653	44.5241	44.52
24 2-Butanone	43	4.354	4.357	(0.886)	262981	95.8034	95.80

27	cis-1,2-Dichloroethene	96	4.305	4.309 (0.876)	211257	43.8952	43.89
28	Chloroform	83	4.672	4.676 (0.951)	382328	43.9636	43.96

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111014.D Page 2
Report Date: 17-Nov-2022 14:03

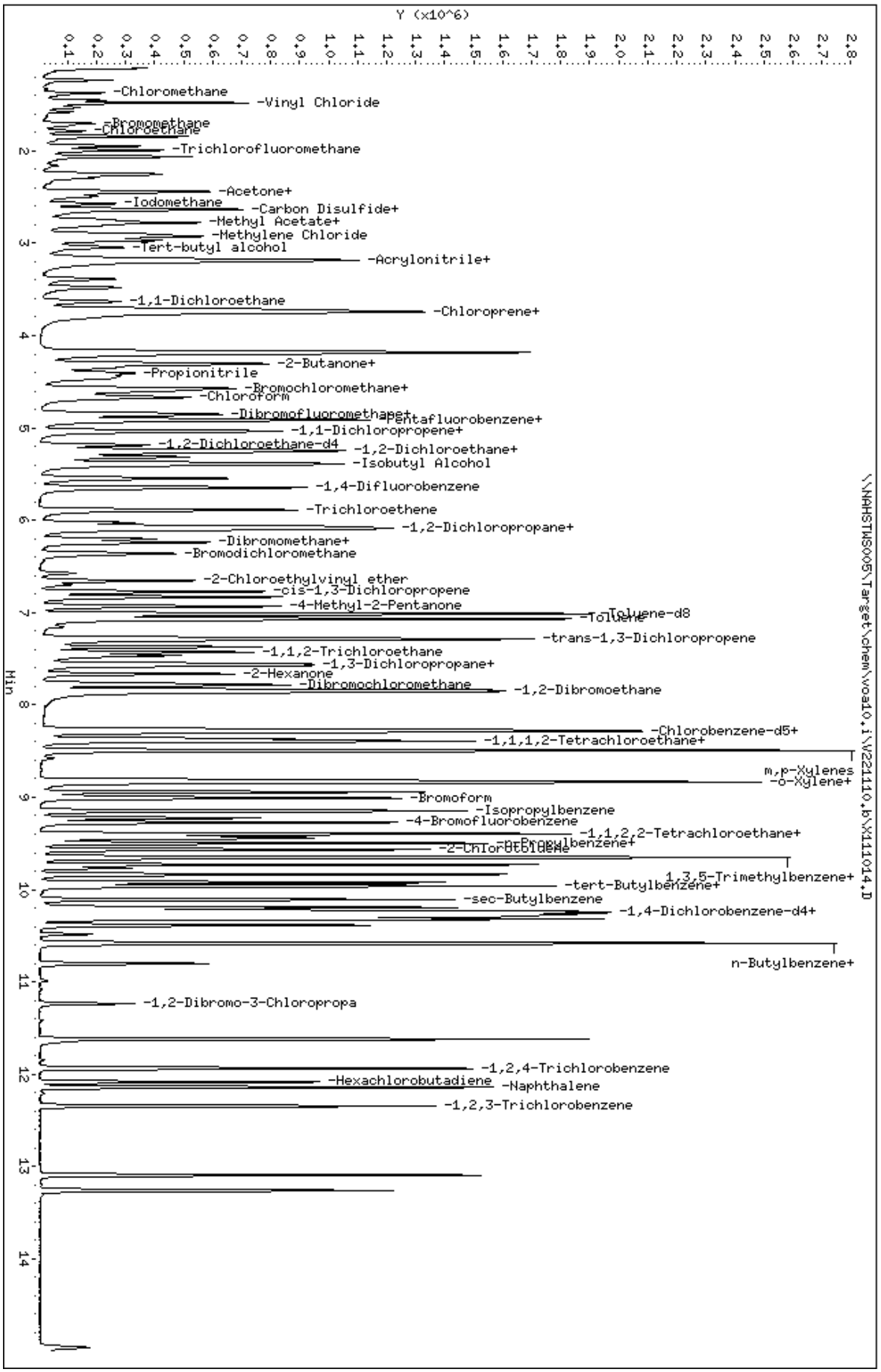
		QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	Compounds							
	29 Bromochloromethane	128	4.567	4.571	(0.930)	120403	50.0028	50.00
$	30 Dibromofluoromethane	113	4.841	4.845	(0.986)	233855	52.2865	52.28
	31 1,1,1-Trichloroethane	97	4.856	4.860	(0.989)	289133	41.3822	41.38
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	265203	43.0592	43.05
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	327419	44.3321	44.33
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	221531	41.5713	41.57
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	281203	49.5080	49.50
*	36 1,4-Difluorobenzene	114	5.643	5.647	(1.000)	799220	50.0000	
	37 Benzene	78	5.242	5.246	(0.929)	902527	44.3605	44.36
	38 Trichloroethene	130	5.887	5.891	(1.043)	228934	43.9699	43.96
	39 Bromodichloromethane	83	6.363	6.359	(1.128)	288935	45.5280	45.52
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	257978	45.3802	45.38
	45 4-Methyl-2-Pentanone	43	6.929	6.933	(0.838)	548189	92.1549	92.15
	46 cis-1,3-Dichloropropene	75	6.775	6.775	(1.201)	408810	48.1989	48.19
*	47 Chlorobenzene-d5	117	8.267	8.271	(1.000)	653475	50.0000	
$	48 Toluene-d8	98	7.011	7.015	(0.848)	909325	55.1838	55.18
	50 Toluene	91	7.071	7.071	(0.855)	915287	47.5216	47.52
	51 trans-1,3-Dichloropropene	75	7.270	7.274	(1.288)	352980	47.3586	47.35
	52 2-Hexanone	43	7.664	7.667	(0.927)	409058	96.8022	96.80
	53 1,1,2-Trichloroethane	83	7.428	7.431	(0.898)	182796	47.4256	47.42
	54 1,3-Dichloropropane	76	7.574	7.577	(0.916)	378618	47.8200	47.81
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	237737	47.2694	47.26
	56 Tetrachloroethene	164	7.555	7.555	(0.914)	178641	44.6854	44.68
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	219150	46.4424	46.44
	59 Chlorobenzene	112	8.294	8.293	(1.003)	571454	43.4724	43.47
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.368	(1.012)	215286	45.7094	45.70
	61 Ethylbenzene	106	8.395	8.395	(1.015)	286530	44.5017	44.50
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	712482	89.8829	89.88
	63 o-Xylene	106	8.833	8.833	(1.068)	352268	44.4944	44.49
	64 Styrene	104	8.845	8.845	(1.070)	653558	45.4509	45.45
	66 Bromoform	173	8.995	8.994	(1.088)	181382	47.6686	47.66
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	823640	41.9264	41.92
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.399	(0.917)	334734	49.2751	49.27
$	69 4-Bromofluorobenzene	95	9.272	9.276	(1.122)	331718	50.9995	50.99
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.254	(1.000)	413942	50.0000	
	75 1,3,5-Trimethylbenzene	105	9.647	9.650	(0.941)	757633	44.9327	44.93
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	599981	41.2550	41.25
	79 1,2,4-Trimethylbenzene	105	9.962	9.965	(0.972)	816045	44.5371	44.53
	81 sec-Butylbenzene	105	10.108	10.112	(0.986)	820714	40.1503	40.15
	87 n-Butylbenzene	91	10.576	10.580	(1.032)	721632	40.4748	40.47
	73 n-Propylbenzene	91	9.497	9.501	(0.926)	983493	43.5571	43.55
	71 1,2,3-Trichloropropane	75	9.433	9.437	(0.920)	393667	44.7387	44.73
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	543417	42.9840	42.98
	84 1,4-Dichlorobenzene	146	10.269	10.273	(1.002)	569343	47.4849	47.48
	88 1,2-Dichlorobenzene	146	10.584	10.588	(1.033)	551148	47.7546	47.75
	89 1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	59208	46.2680	46.26
	90 1,2,4-Trichlorobenzene	180	11.937	11.937	(1.165)	420462	47.9747	47.97
	92 Naphthalene	128	12.143	12.143	(1.185)	1078074	46.3050	46.30
	147 Methylcyclohexane	55	6.067	6.067	(1.075)	326616	44.5974	44.59
	141 Cyclohexane	56	4.912	4.912	(1.000)	263843	53.6499	53.64
	138 Freon TF	101	2.449	2.449	(0.499)	125711	45.5776	45.57
	146 Methyl Acetate	43	2.809	2.813	(0.572)	173870	40.0938	40.09

21 Vinyl Acetate	43	3.716	3.716 (0.757)	1046436	97.4677	97.46(M)
26 2,2-Dichloropropane	77	4.305	4.305 (0.876)	282754	44.1311	44.13

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	44 Dibromomethane	93	6.202	6.205	(1.099)	146069	44.8836	44.88
	91 Hexachlorobutadiene	225	12.083	12.087	(1.179)	167531	48.3446	48.34
	74 Bromobenzene	156	9.399	9.399	(0.917)	290235	45.9397	45.93
	76 2-Chlorotoluene	91	9.564	9.568	(0.933)	659387	45.5455	45.54
	77 4-Chlorotoluene	91	9.658	9.662	(0.942)	804419	45.6251	45.62
	82 p-Isopropyltoluene	119	10.232	10.235	(0.998)	781335	42.0216	42.02
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	383604	47.3996	47.39
	148 tert-Butyl Alcohol	59	3.045	3.049	(0.620)	396890	598.512	598.51
M	94 1,2-Dichloroethylene (total)	96				375453	84.4458	84.44(R)
M	95 Xylenes (total)	106				1064750	134.377	134.37

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.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Min
2 3 4 5 6 7 8 9 10 11 12 13 14
-Chloromethane
-Vinyl Chloride
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-Acetone+
-Iodomethane
-Carbon Disulfide+
-Methyl Acetate+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-1,1-Dichloroethane
-Chloroprene+
-2-Butanone+
-Propionitrile
-Bromochloromethane+
-Chloroform
-Dibromofluoromethane+
Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane-d4
-1,2-Dichloroethane+
-Isobutyl Alcohol
-1,4-Difluorobenzene
-Trichloroethene
-1,2-Dichloropropane+
-Dibromomethane+
-Bromodichloromethane
-2-Chloroethylvinyl ether
-cis-1,3-Dichloropropene
-4-Methyl-2-Pentanone
Toluene-d8
-Toluene
-trans-1,3-Dichloropropene
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
m,p-Xylenes
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene+
-2-Chlorotoluene
1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
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Date : 10-NOV-2022 17:39
Client ID: ICV
Sample Info: WSTD050;WSTD050;2;;ICV
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10,i
Operator: FT
Column diameter: 0.18
Page 1

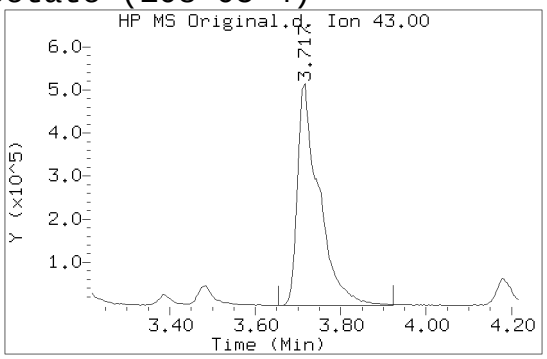
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111014.D
Inj Date : 10-NOV-2022 17:39
InstruID : voa10.i
LabSampID : ICV

Vinyl Acetate (108-05-4)

Reason Code:

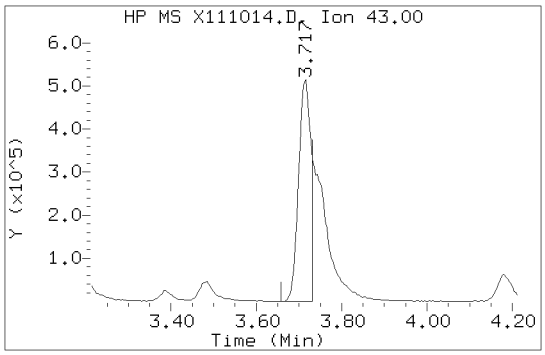
BEFORE

MASS
43
AREA
1819231
HEIGHT
514047
17-Nov-2022
13:58
linh
pham



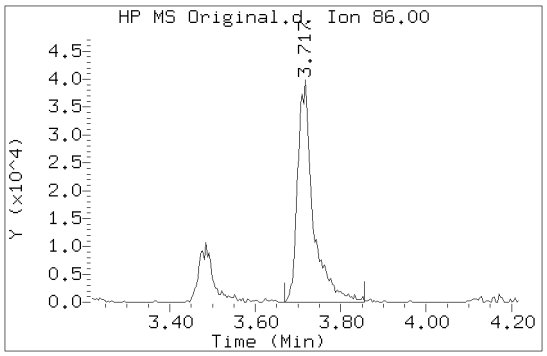
AFTER

MASS
43
AREA
1046436
HEIGHT
513899
17-Nov-2022
14:02
linh
pham



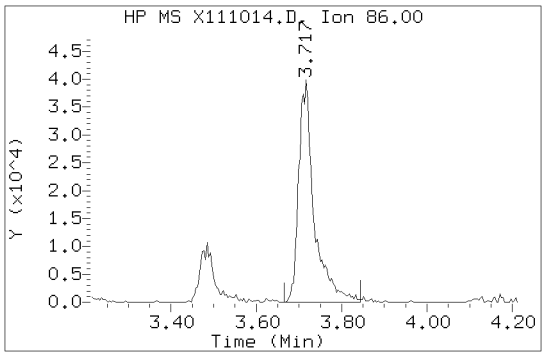
BEFORE

MASS
86
AREA
102334
HEIGHT
39872
17-Nov-2022
13:58
linh
pham



AFTER

MASS
86
AREA
101949
HEIGHT
39872
17-Nov-2022
14:02
linh
pham

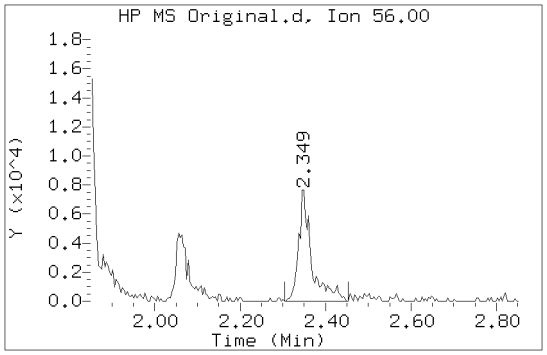


Acrolein (107-02-8)

Reason Code:

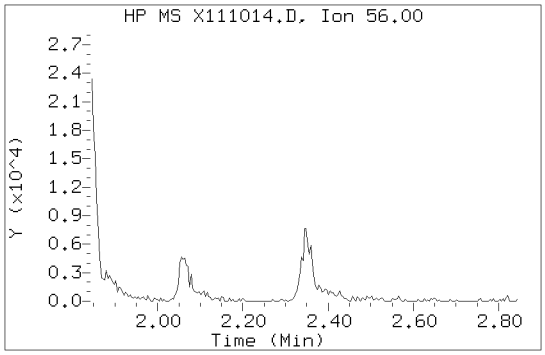
BEFORE

MASS
56
AREA
16449
HEIGHT
7668
17-Nov-2022
13:58
linh
pham



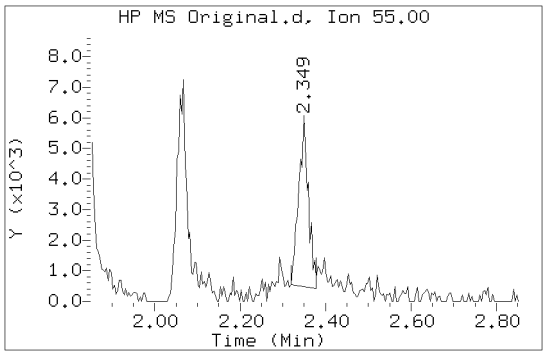
AFTER

MASS
56
AREA
20388
HEIGHT
7681
17-Nov-2022
14:02
linh
pham



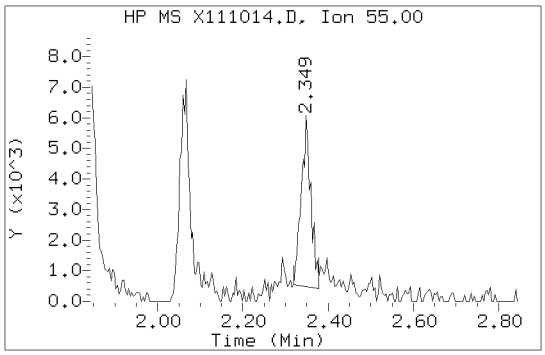
BEFORE

MASS
55
AREA
8877
HEIGHT
5594
17-Nov-2022
13:58
linh
pham



AFTER

MASS
55
AREA
8875
HEIGHT
5593
17-Nov-2022
14:02
linh
pham



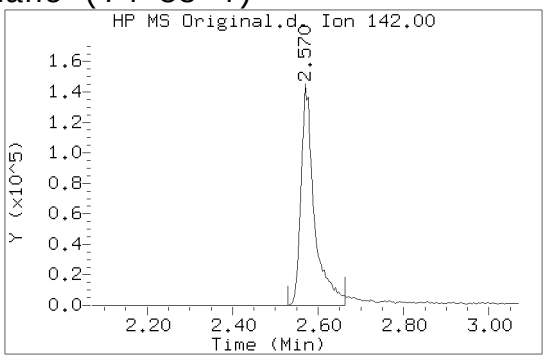
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221110.b\X111014.D
Inj Date : 10-NOV-2022 17:39
InstruID : voa10.i
LabSampID : ICV

Iodomethane (74-88-4)

Reason Code:

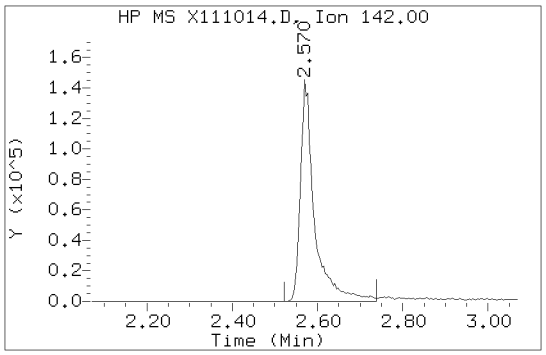
BEFORE

MASS
142
AREA
321652
HEIGHT
145408
17-Nov-2022
13:58
linh
pham



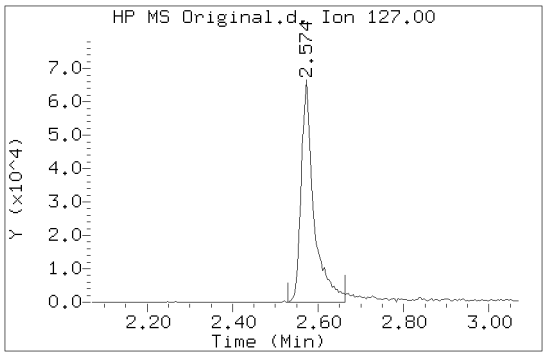
AFTER

MASS
142
AREA
338259
HEIGHT
145414
17-Nov-2022
14:02
linh
pham



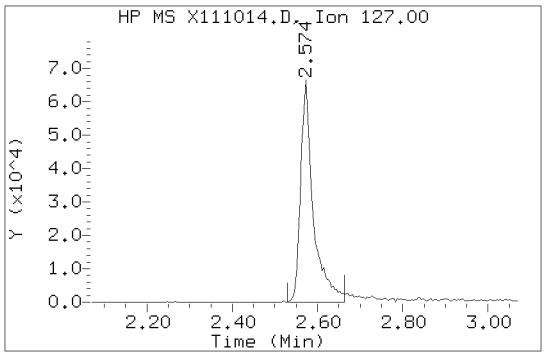
BEFORE

MASS
127
AREA
140170
HEIGHT
66552
17-Nov-2022
13:58
linh
pham



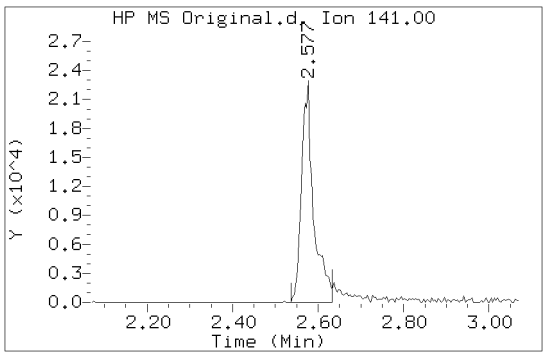
AFTER

MASS
127
AREA
140170
HEIGHT
66552
17-Nov-2022
14:02
linh
pham



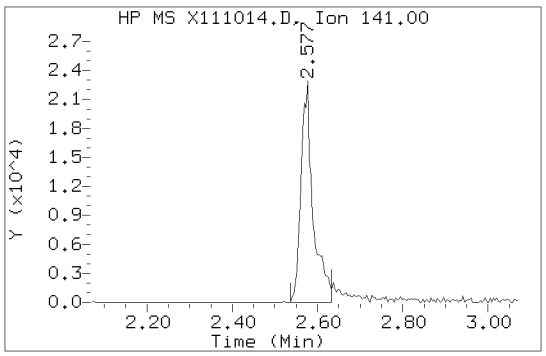
BEFORE

MASS
141
AREA
45862
HEIGHT
22944
17-Nov-2022
13:58
linh
pham



AFTER

MASS
141
AREA
45862
HEIGHT
22944
17-Nov-2022
14:02
linh
pham



right solutions.
right partner.

Raw Data VOA10 421680

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111301.D Page 1
Report Date: 13-Nov-2022 19:39

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111301.D
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 13-NOV-2022 11:15
Operator : PC Inst ID: voa10.i
Smp Info : BFB;BFB;3;;BFB
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\bfb.m
Meth Date : 27-Sep-2022 15:19 Linh.Pham Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 4.14 Sample Matrix: WATER
Processing Host: NAHSTW7051

Concentration Formula: Amt * DF * Uf * Vf * Vi * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	2.000	Injection Volume
Cpnd Variable		Local Compound Variable

					CONCENTRATIONS ON-COL (ug/L)	FINAL (ug/l)		
RT	EXP RT	REL RT	MASS	RESPONSE			TARGET RANGE	RATIO
1 bfb							CAS #: 460-00-4	
9.272	9.276	(0.000)	95	91432			0.00- 100.00	100.00
9.272	9.276	(0.000)	50	20688			15.00- 40.00	22.63
9.272	9.276	(0.000)	75	45672			30.00- 60.00	49.95
9.272	9.276	(0.000)	96	6197			5.00- 9.00	6.78
9.272	9.276	(0.000)	173	0	0.0	0.0	0.00- 2.00	0.00
9.272	9.276	(0.000)	174	86664			50.00- 0.00	94.79
9.272	9.276	(0.000)	175	7586			5.00- 9.00	8.75
9.272	9.276	(0.000)	176	84712			95.00- 101.00	97.75
9.272	9.276	(0.000)	177	5413			5.00- 9.00	6.39

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	22.63
75	30.00 - 60.00% of mass 95	49.95
96	5.00 - 9.00% of mass 95	6.78
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	94.79
175	5.00 - 9.00% of mass 174	8.30 (8.75)
176	95.00 - 101.00% of mass 174	92.65 (97.75)
177	5.00 - 9.00% of mass 176	5.92 (6.39)

Data File: V111301.D
Spectrum: Scan 2316 (9.27)
Location of Maximum: 95.10
Number of points: 87

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.90	1276	59.20	653	82.00	311	110.10	372
37.10	5968	60.10	1077	82.90	400	111.80	240
38.10	6820	61.00	5224	83.20	470	116.00	405
39.10	2913	62.00	4100	85.30	178	117.00	554
39.90	936	63.10	3203	86.10	388	117.90	612
41.10	2192	63.90	168	86.90	2921	118.80	858
42.20	1825	66.20	181	88.00	3745	122.90	156
43.00	2035	66.90	458	90.70	463	128.00	442
43.90	1094	68.10	10763	91.30	585	129.90	267
45.10	1368	69.10	10536	92.10	3428	134.90	167
46.00	199	70.10	1024	93.00	5655	140.80	954
47.10	2242	71.20	333	94.00	12021	141.10	828
48.00	825	72.00	1058	95.10	91432	143.00	1189
49.00	3333	73.00	4356	96.00	6197	147.90	183
50.10	20688	74.10	16346	96.90	447	154.30	185
51.10	5766	75.10	45672	97.20	556	155.00	260
52.10	229	76.10	4556	98.10	705	170.70	169
54.00	319	77.10	574	103.90	418	174.00	86664
55.10	3936	78.10	540	105.10	217	175.00	7586
56.10	2692	79.00	2463	105.90	676	176.00	84712
57.10	2911	80.00	1062	106.90	322	177.00	5413
57.90	201	80.90	3262	109.00	176		

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111301.D Page 1

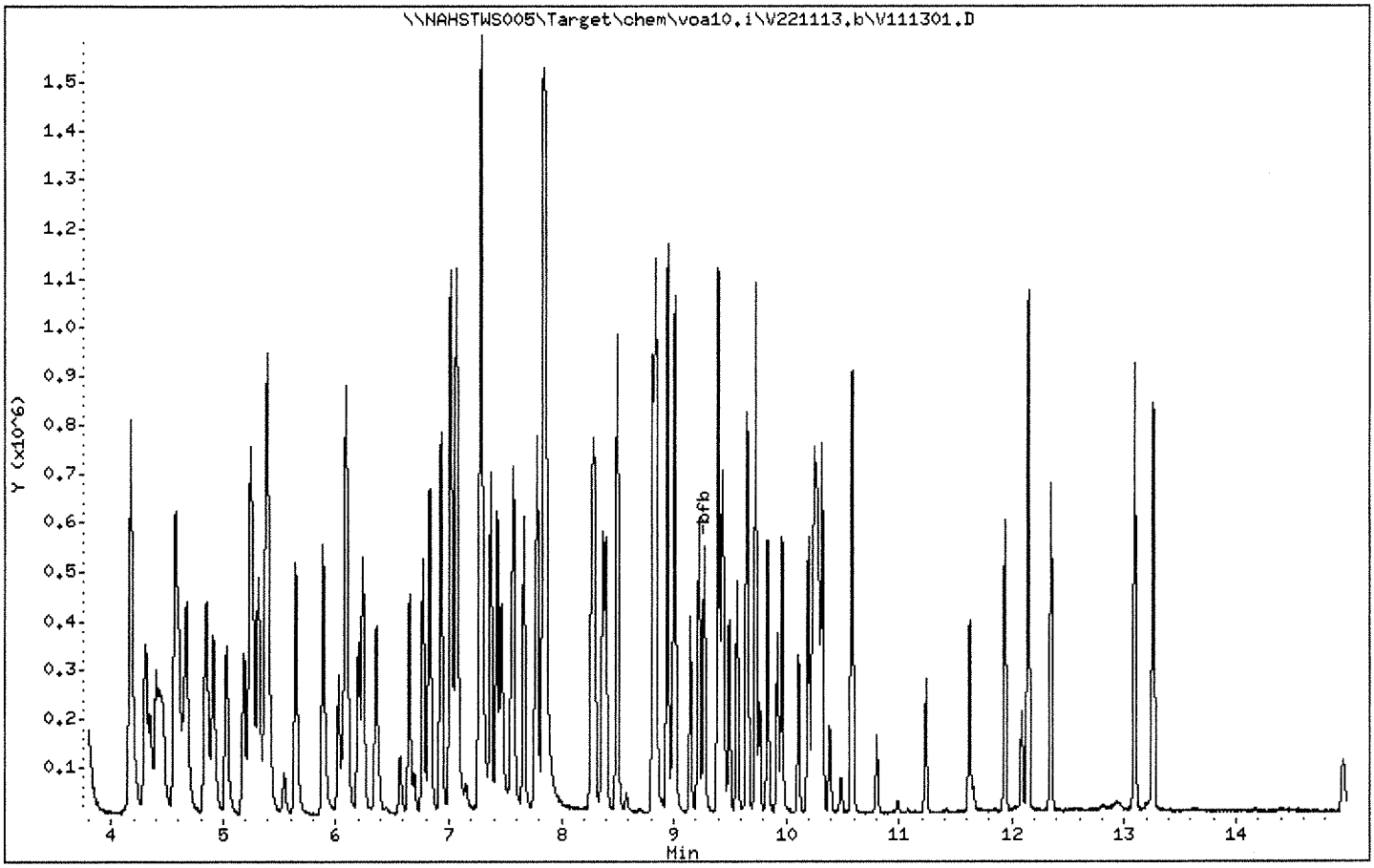
Date : 13-NOV-2022 11:15

Client ID: BFB Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111301.D Page 2

Date : 13-NOV-2022 11:15

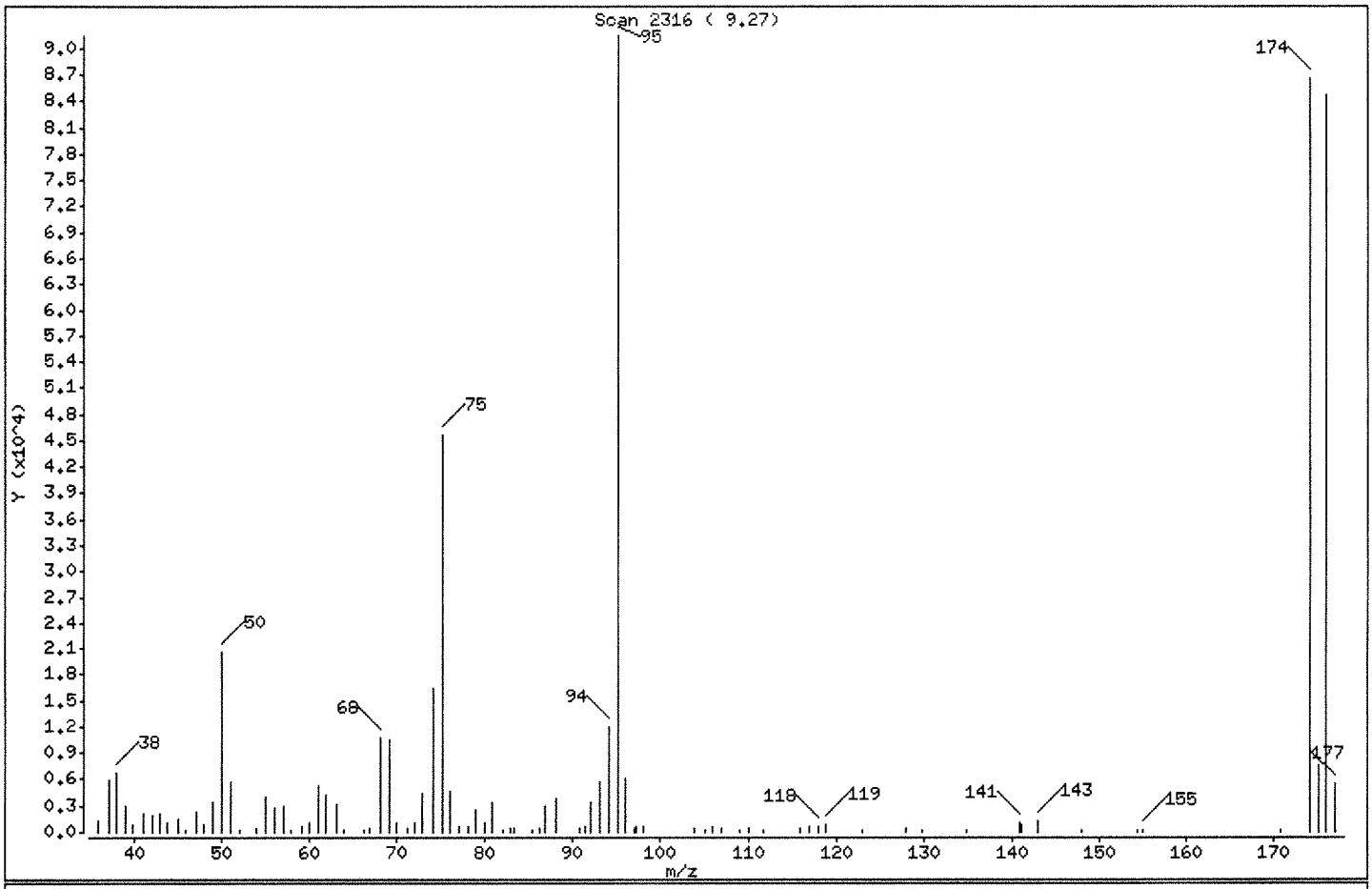
Client ID: BFB Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	22.63
75	30.00 - 60.00% of mass 95	49.95
96	5.00 - 9.00% of mass 95	6.78
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	94.79
175	5.00 - 9.00% of mass 174	8.30 (8.75)
176	95.00 - 101.00% of mass 174	92.65 (97.75)
177	5.00 - 9.00% of mass 176	5.92 (6.39)

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111301.D

Date : 13-NOV-2022 11:15

Client ID: BFB Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

Data File: V111301.D
Spectrum: Scan 2316 (9.27)
Location of Maximum: 95.10
Number of points: 87

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.90	1276	59.20	653	82.00	311	110.10	372
37.10	5968	60.10	1077	82.90	400	111.80	240
38.10	6820	61.00	5224	83.20	470	116.00	405
39.10	2913	62.00	4100	85.30	178	117.00	554
39.90	936	63.10	3203	86.10	388	117.90	612
41.10	2192	63.90	168	86.90	2921	118.80	858
42.20	1825	66.20	181	88.00	3745	122.90	156
43.00	2035	66.90	458	90.70	463	128.00	442
43.90	1094	68.10	10763	91.30	585	129.90	267
45.10	1368	69.10	10536	92.10	3428	134.90	167
46.00	199	70.10	1024	93.00	5655	140.80	954
47.10	2242	71.20	333	94.00	12021	141.10	828
48.00	825	72.00	1058	95.10	91432	143.00	1189
49.00	3333	73.00	4356	96.00	6197	147.90	183
50.10	20688	74.10	16346	96.90	447	154.30	185
51.10	5766	75.10	45672	97.20	556	155.00	260
52.10	229	76.10	4556	98.10	705	170.70	169
54.00	319	77.10	574	103.90	418	174.00	86664
55.10	3936	78.10	540	105.10	217	175.00	7586
56.10	2692	79.00	2463	105.90	676	176.00	84712
57.10	2911	80.00	1062	106.90	322	177.00	5413
57.90	201	80.90	3262	109.00	176		

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111301.D
Inj Date : 13-NOV-2022 11:15
InstruID : voa10.i
LabSampID : BFB

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111303.D Page 1
Report Date: 18-Nov-2022 14:05

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111303.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 13-NOV-2022 11:55
Operator : PC Inst ID: voa10.i
Smp Info : VSTD050;VSTD050;2;;
Misc Info : V10;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 14:05 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	504297	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	241663	50.0000	55.96
3	Chloromethane	50	1.370	1.370	(0.279)	246826	50.0000	52.37
5	Vinyl Chloride	62	1.452	1.452	(0.295)	247738	50.0000	52.93
6	Bromomethane	94	1.700	1.700	(0.346)	111761	50.0000	52.90
7	Chloroethane	64	1.786	1.786	(0.363)	145040	50.0000	53.80
8	Trichlorofluoromethane	101	1.996	1.996	(0.406)	281883	50.0000	45.83
9	Acrolein	56	2.344	2.344	(0.477)	21264	100.000	104.43(M)
10	Acetone	43	2.491	2.491	(0.507)	210454	100.000	102.03
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	185341	50.0000	58.73
15	Iodomethane	142	2.569	2.569	(0.523)	396720	100.000	99.63
16	Acrylonitrile	53	3.147	3.147	(0.640)	171659	100.000	92.29
17	Methylene Chloride	84	2.896	2.896	(0.589)	196409	50.0000	59.80(M)
18	Methyl tert-butyl ether	73	3.195	3.195	(0.650)	678030	50.0000	52.63
19	Carbon Disulfide	76	2.633	2.633	(0.536)	1061658	100.000	119.41
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	199392	50.0000	51.69
21	Vinyl Acetate	43	3.713	3.713	(0.755)	1088873	100.000	106.46(M)
22	1,1-Dichloroethane	63	3.630	3.630	(0.738)	395597	50.0000	55.72
24	2-Butanone	43	4.350	4.350	(0.885)	259514	100.000	99.23
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	320337	50.0000	52.48

27 cis-1,2-Dichloroethene	96	4.305	4.305 (0.876)	237709	50.0000	51.84
28 Chloroform	83	4.672	4.672 (0.950)	397590	50.0000	47.99

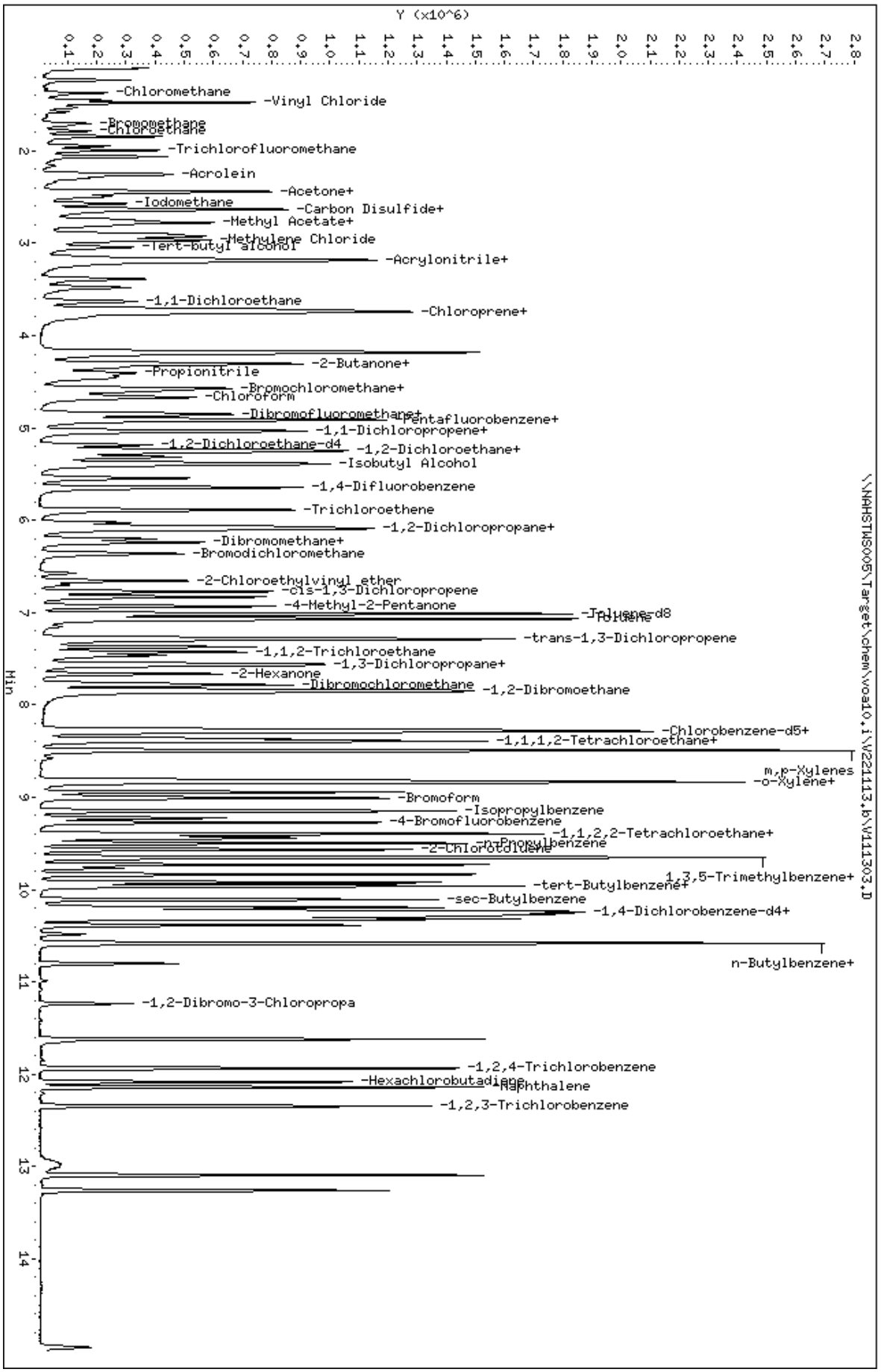
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.571	4.571	(0.930)	117000	50.0000	51.00
$	30 Dibromofluoromethane	113	4.845	4.845	(0.986)	226989	50.0000	53.27
	31 1,1,1-Trichloroethane	97	4.856	4.856	(0.988)	315600	50.0000	47.41
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	292595	50.0000	50.26
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	326752	50.0000	46.80
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	248753	50.0000	49.38
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	273680	50.0000	50.57
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	755397	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	934697	50.0000	48.60
	38 Trichloroethene	130	5.887	5.887	(1.043)	239187	50.0000	48.60
	39 Bromodichloromethane	83	6.359	6.359	(1.127)	292078	50.0000	48.69
	41 2-Chloroethylvinyl ether	63	6.652	6.652	(1.179)	207736	100.000	101.88
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	263954	50.0000	49.12
	44 Dibromomethane	93	6.198	6.198	(1.098)	141634	50.0000	46.04
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	537267	100.000	93.84
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.200)	404628	50.0000	50.47
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	628544	50.0000	
$	48 Toluene-d8	98	7.012	7.012	(0.848)	872340	50.0000	55.03
	50 Toluene	91	7.072	7.072	(0.855)	936160	50.0000	50.53
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	344187	50.0000	48.85
	52 2-Hexanone	43	7.664	7.664	(0.927)	376186	100.000	92.62
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	177653	50.0000	47.91
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	366138	50.0000	48.07
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	228486	50.0000	47.23
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	182417	50.0000	47.43
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	215992	50.0000	47.58
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	188020	50.0000	45.21
	59 Chlorobenzene	112	8.294	8.294	(1.003)	573558	50.0000	45.36
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	215925	50.0000	47.66
	61 Ethylbenzene	106	8.391	8.391	(1.015)	280517	50.0000	45.29
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	694716	100.000	91.11
	63 o-Xylene	106	8.833	8.833	(1.068)	348709	50.0000	45.79
	64 Styrene	104	8.841	8.841	(1.069)	627405	50.0000	45.36
	66 Bromoform	173	8.991	8.991	(1.088)	168393	50.0000	46.05
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	804777	50.0000	42.59
	68 1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	306423	50.0000	48.56
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	310121	50.0000	49.59
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	384414	50.0000	
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	368410	50.0000	45.08
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	965183	50.0000	46.02
	74 Bromobenzene	156	9.399	9.399	(0.917)	278080	50.0000	47.39
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	720471	50.0000	46.01
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	634958	50.0000	47.17
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	759320	50.0000	46.37
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	587826	50.0000	43.52
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	772208	50.0000	45.38
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	813596	50.0000	42.85
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	757821	50.0000	43.88
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	513890	50.0000	43.77
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	540588	50.0000	48.53
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	722027	50.0000	43.60
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	523748	50.0000	48.86

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	57077	50.0000	48.02
90	1,2,4-Trichlorobenzene	180	11.934	11.934 (1.164)	402841	50.0000	49.49

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	186090	50.0000	56.42
	92 Naphthalene	128	12.140	12.140	(1.184)	1021466	50.0000	47.24
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	380916	50.0000	50.70
M	94 1,2-Dichloroethylene (total)	96				437101	100.000	(a)
	135 1,4-Dioxane	88	6.247	6.247	(1.271)	48601	1000.00	802.62
	141 Cyclohexane	56	4.912	4.912	(0.999)	301010	50.0000	62.03
	138 Freon TF	101	2.449	2.449	(0.498)	163160	50.0000	59.18(M)
	147 Methylcyclohexane	55	6.067	6.067	(1.075)	277134	50.0000	40.03(M)
	146 Methyl Acetate	43	2.813	2.813	(0.572)	222011	50.0000	53.73
	148 Tert-Butyl alcohol	59	3.042	3.042	(0.619)	408005	1000.00	645.85
	149 Isopropyl Alcohol	45	2.637	2.637	(0.536)	318174	1000.00	714.05
	72 trans-1,4-Dichloro-2-butene	53	9.444	9.444	(1.142)	99434	50.0000	43.33
	12 Isobutyl Alcohol	43	5.377	5.377	(1.094)	752989	1000.00	957.62
	13 Acetonitrile	39	2.776	2.776	(0.565)	322428	500.000	457.06
	14 Allyl Chloride	41	2.776	2.776	(0.565)	729227	50.0000	67.65
	25 Methacrylonitrile	41	4.575	4.575	(0.931)	215479	50.0000	51.27
	40 Methyl Methacrylate	41	6.239	6.239	(1.269)	241834	50.0000	48.08
	4 Propionitrile	54	4.406	4.406	(0.896)	373374	500.000	509.12
	23 Chloroprene	53	3.735	3.735	(0.760)	346363	50.0000	55.64
	49 Ethyl Methacrylate	69	6.239	6.239	(1.106)	165033	50.0000	51.05

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Date : 13-NOV-2022 11:55
Client ID: VSTD050
Sample Info: VSTD050;VSTD050;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

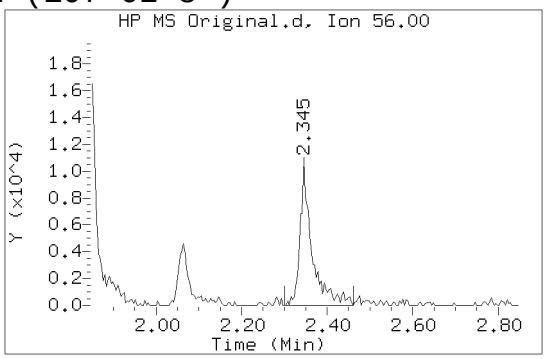
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111303.D
Inj Date : 13-NOV-2022 11:55
InstruID : voa10.i
LabSampID : VSTD050

Acrolein (107-02-8)

Reason Code:

BEFORE

MASS
56
AREA
21264
HEIGHT
11028
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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18-Nov-2022
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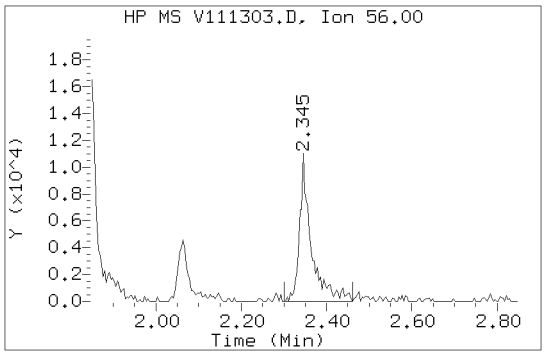

BEFORE

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13:52
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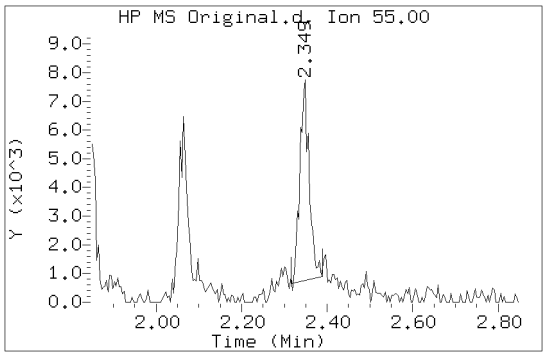

AFTER

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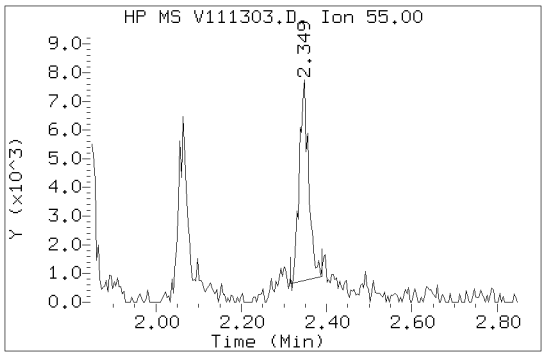

Methylene Chloride (75-09-2)

Reason Code:

BEFORE

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17-Nov-2022
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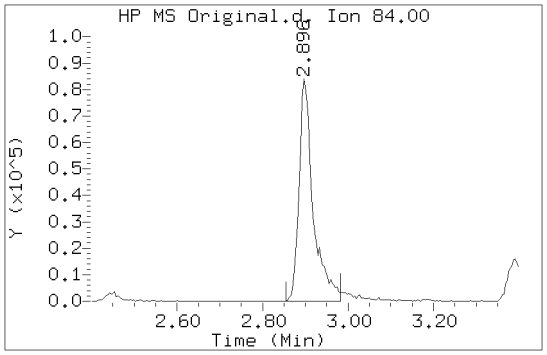

AFTER

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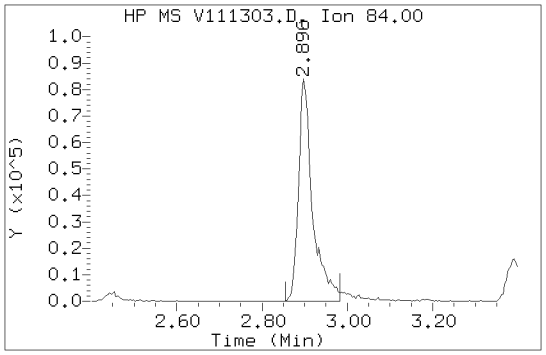

BEFORE

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HEIGHT
53816
17-Nov-2022
13:52
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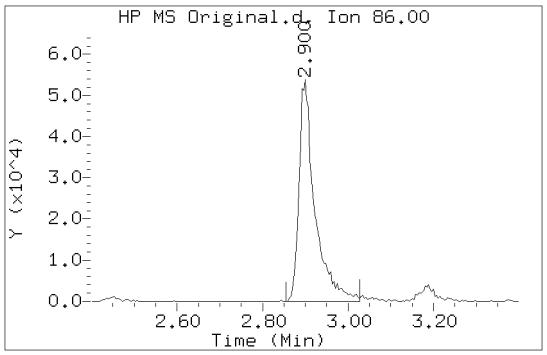
pham



AFTER

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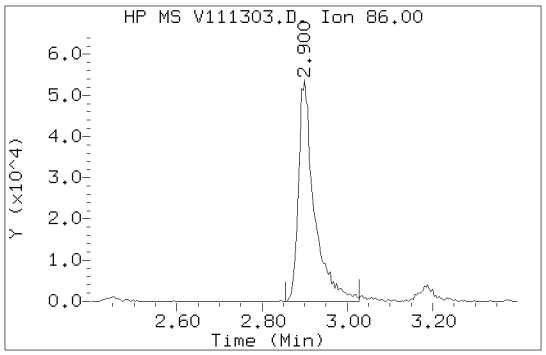

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Inj Date : 13-NOV-2022 11:55
InstruID : voa10.i
LabSampID : VSTD050

Methylene Chloride (75-09-2)

BEFORE

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HEIGHT
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17-Nov-2022
13:52
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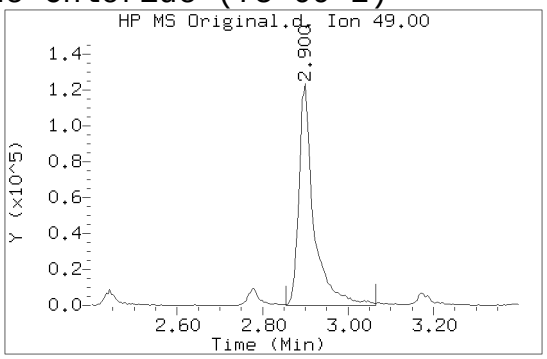
pham



AFTER

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18-Nov-2022
14:05
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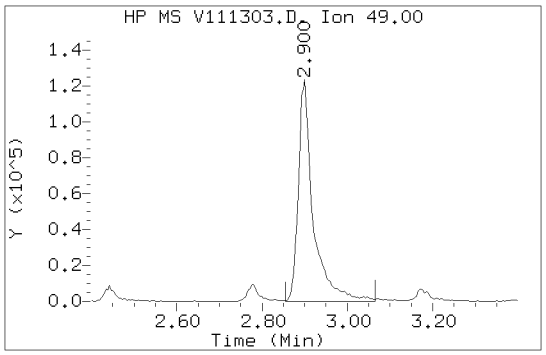

Reason Code:

Vinyl Acetate (108-05-4)

BEFORE

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AREA
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HEIGHT
547162
17-Nov-2022
13:52
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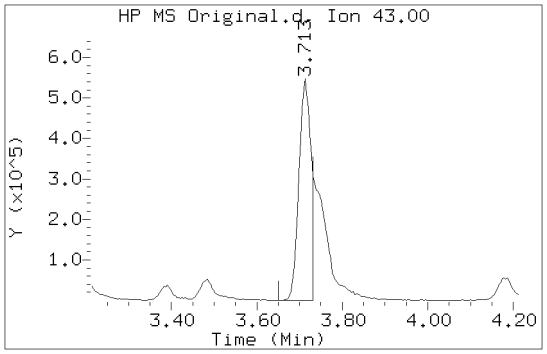

AFTER

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HEIGHT
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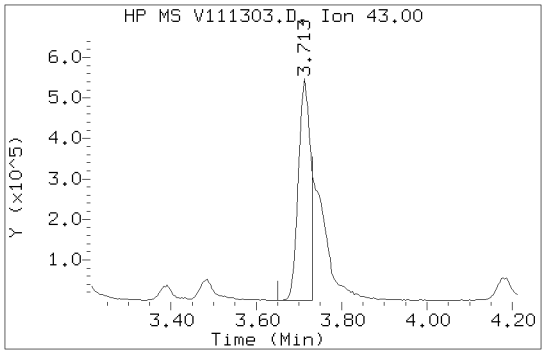
18-Nov-2022
14:05
linh
pham



Reason Code:

BEFORE

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HEIGHT
38872
17-Nov-2022
13:52
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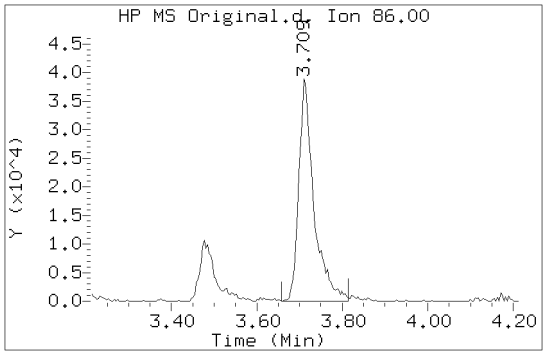

AFTER

MASS
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HEIGHT
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18-Nov-2022
14:05
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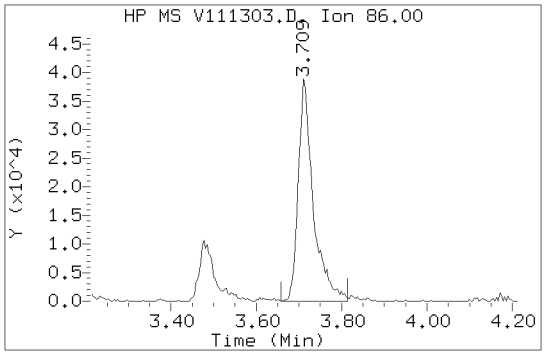

Reason Code:

Freon TF (76-13-1)

BEFORE

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AREA
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HEIGHT
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17-Nov-2022
13:52
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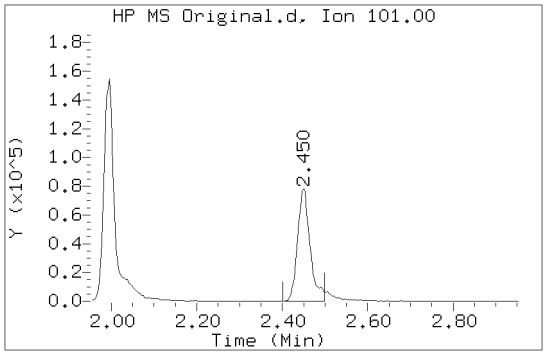

AFTER

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18-Nov-2022
14:05
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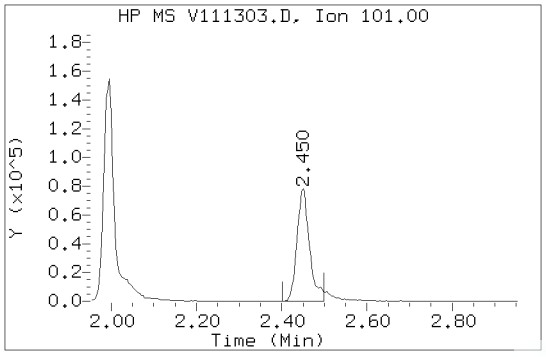

Reason Code:

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Inj Date : 13-NOV-2022 11:55
InstruID : voa10.i
LabSampID : VSTD050

Freon TF (76-13-1)

Reason Code:

BEFORE

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HEIGHT
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17-Nov-2022
13:52
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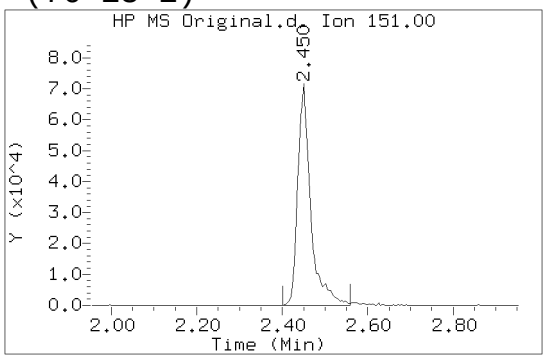

AFTER

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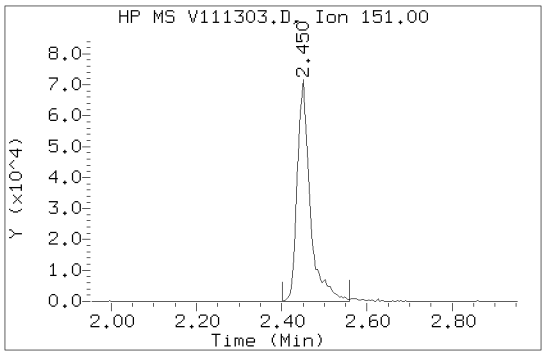

Methylcyclohexane (108-87-2)

Reason Code:

BEFORE

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17-Nov-2022
13:52
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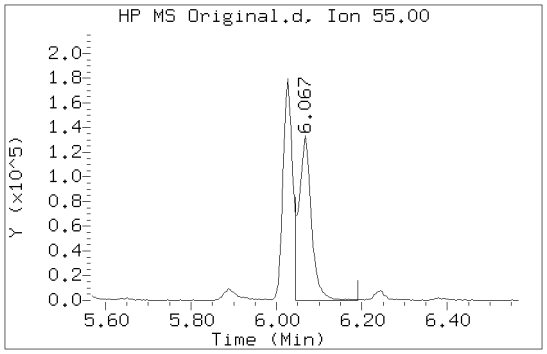

AFTER

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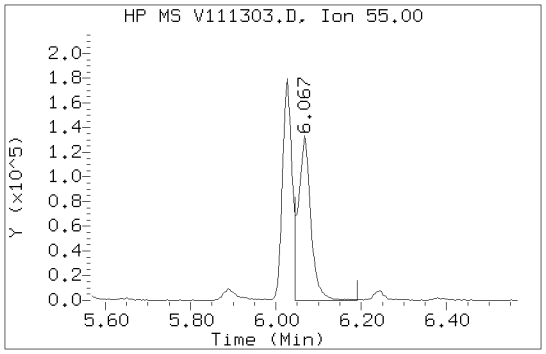

BEFORE

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HEIGHT
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17-Nov-2022
13:52
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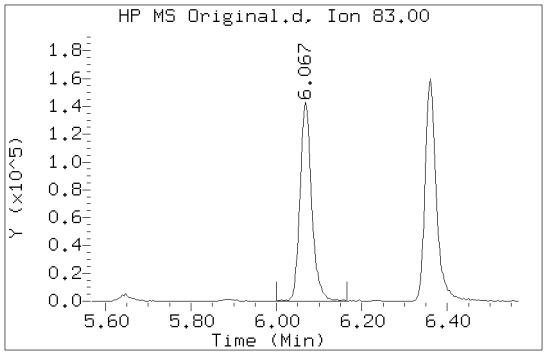

AFTER

MASS
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18-Nov-2022
14:05
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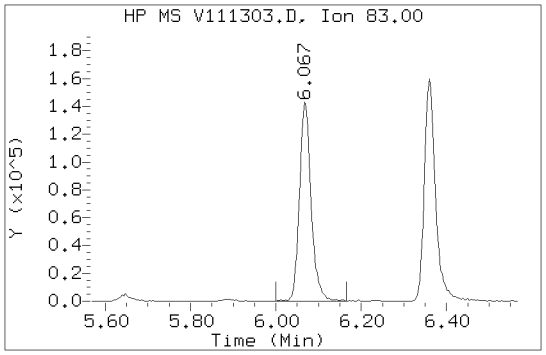


Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111304.D Page 1
Report Date: 13-Nov-2022 19:22

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111304.D
Lab Smp Id: CCB Client Smp ID: CCB
Inj Date : 13-NOV-2022 12:16
Operator : PC Inst ID: voa10.i
Smp Info : CCB;CCB
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\nahstws005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 13-Nov-2022 12:12 Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTWS005

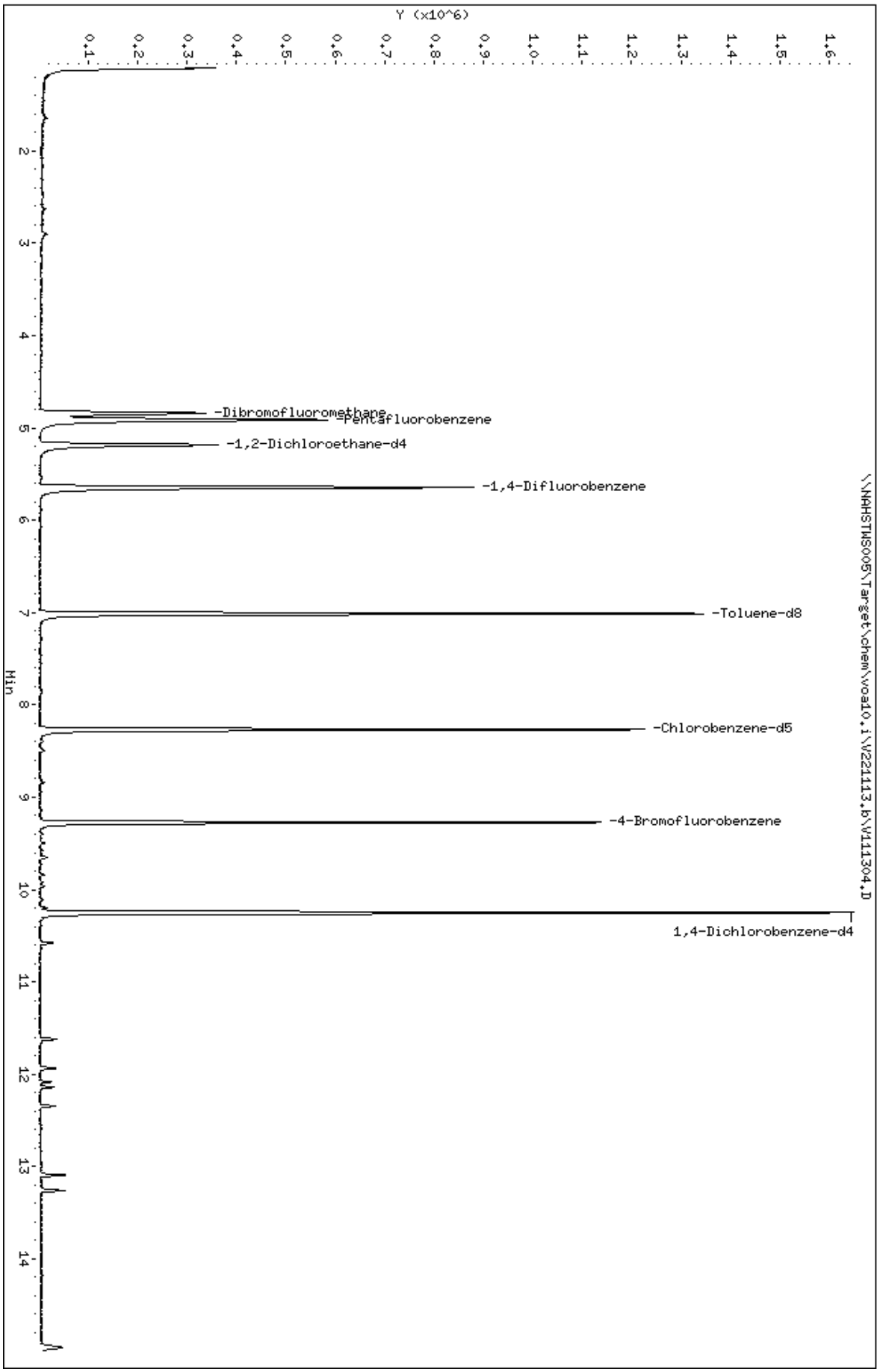
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	482087	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.985)	239332	58.7584	58.75
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	285062	55.1088	55.10
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	730334	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	626042	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	833420	52.8056	52.80
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	314183	50.4309	50.43
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	400143	50.0000	

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111304.D
Date : 13-NOV-2022 12:16
Client ID: CCB
Sample Info: CCB,CCB
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111305.D Page 1
Report Date: 18-Nov-2022 14:12

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111305.D
Lab Smp Id: VLCSW-221113 Client Smp ID: VLCSW-221113
Inj Date : 13-NOV-2022 12:36
Operator : PC Inst ID: voa10.i
Smp Info : VLCSW-221113;VLCSW-221113;3;;LCS
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 14:11 Linh.Pham Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	474019	50.0000	
2 Dichlorodifluoromethane	85	1.231	1.231	(0.250)	79548	19.5999	19.59
3 Chloromethane	50	1.370	1.370	(0.279)	92575	20.8985	20.89
5 Vinyl Chloride	62	1.452	1.452	(0.295)	81061	18.4261	18.42
6 Bromomethane	94	1.700	1.700	(0.346)	34796	17.5243	17.52
7 Chloroethane	64	1.782	1.786	(0.363)	49268	19.4430	19.44
8 Trichlorofluoromethane	101	1.992	1.996	(0.405)	107951	18.6736	18.67
9 Acrolein	56	2.352	2.344	(0.478)	4674	23.3219	23.32
10 Acetone	43	2.491	2.491	(0.507)	62320	28.4188	28.41
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	45600	16.3665	16.36(M)
15 Iodomethane	142	2.573	2.569	(0.523)	87103	27.1417	27.14
16 Acrylonitrile	53	3.143	3.147	(0.639)	80787	46.2107	46.21
17 Methylene Chloride	84	2.899	2.896	(0.590)	55941	16.3573	16.35
18 Methyl tert-butyl ether	73	3.195	3.195	(0.650)	273939	22.6221	22.62
19 Carbon Disulfide	76	2.629	2.633	(0.535)	265926	32.4822	32.48
20 trans-1,2-Dichloroethene	96	3.177	3.173	(0.646)	75717	20.8826	20.88
21 Vinyl Acetate	43	3.709	3.713	(0.754)	431534	44.8868	44.88(M)
22 1,1-Dichloroethane	63	3.630	3.630	(0.738)	160537	24.5316	24.53
24 2-Butanone	43	4.354	4.350	(0.886)	100869	41.0365	41.03
26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	125363	21.8505	21.85

27 cis-1,2-Dichloroethene	96	4.305	4.305 (0.876)	92432	21.4479	21.44
28 Chloroform	83	4.668	4.672 (0.950)	157820	20.2664	20.26

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111305.D Page 2
Report Date: 18-Nov-2022 14:12

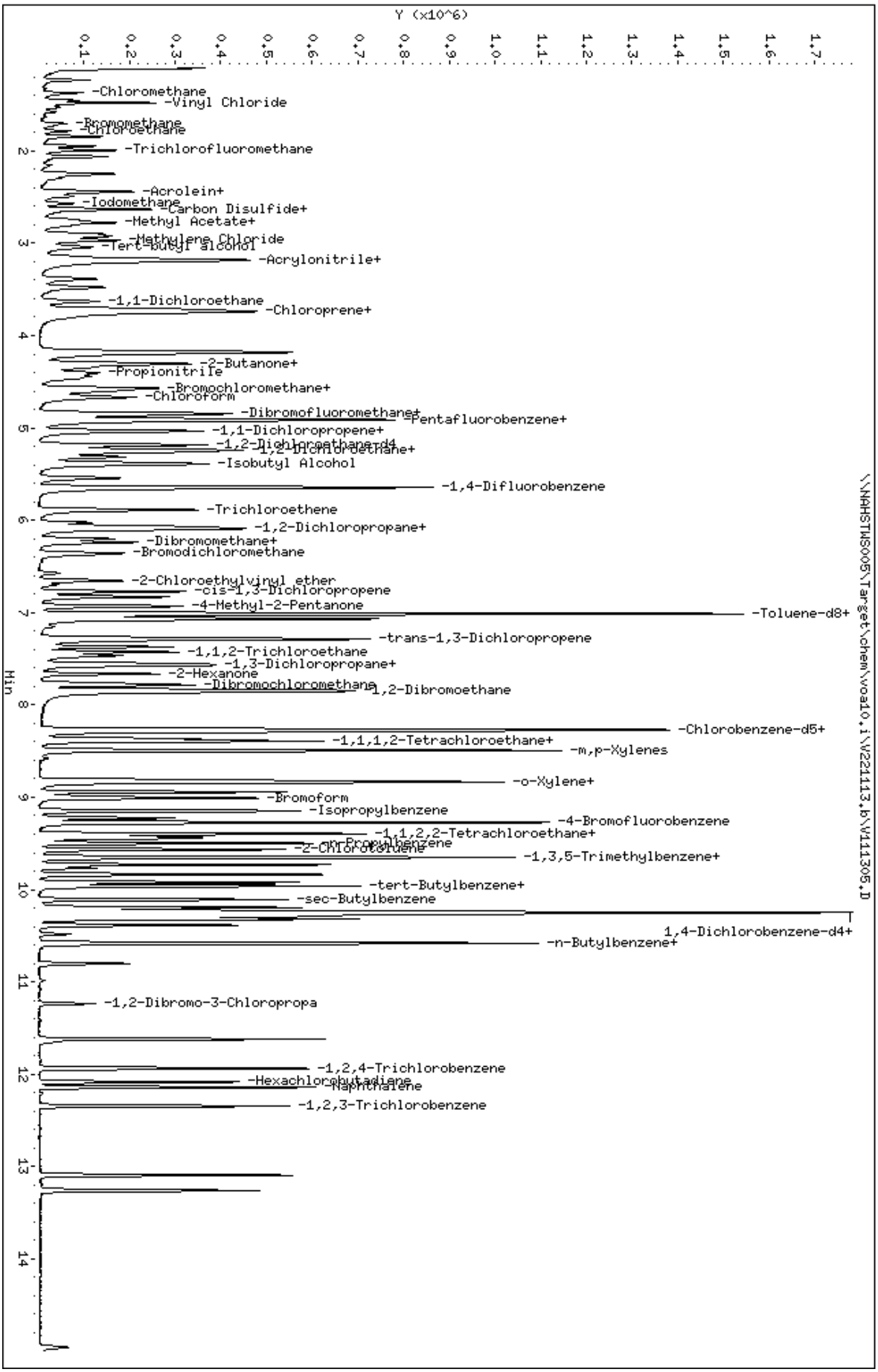
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	29 Bromochloromethane	128	4.567	4.571	(0.929)	49621	23.0133	23.01
$	30 Dibromofluoromethane	113	4.845	4.845	(0.986)	219693	54.8548	54.85
	31 1,1,1-Trichloroethane	97	4.860	4.856	(0.989)	125131	20.0003	20.00
	32 1,1-Dichloropropene	75	5.032	5.036	(0.892)	115841	20.5172	20.51
	33 1,2-Dichloroethane	62	5.261	5.265	(0.932)	137504	20.3094	20.30
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	94587	19.3624	19.36
$	35 1,2-Dichloroethane-d4	65	5.190	5.186	(1.056)	271904	53.4597	53.45
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	732654	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	372927	19.9953	19.99
	38 Trichloroethene	130	5.887	5.887	(1.043)	94224	19.7412	19.74
	39 Bromodichloromethane	83	6.359	6.359	(1.127)	114420	19.6674	19.66
	41 2-Chloroethylvinyl ether	63	6.655	6.652	(1.179)	76010	38.4385	38.43
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	106130	20.3652	20.36
	44 Dibromomethane	93	6.202	6.198	(1.099)	59441	19.9243	19.92
	45 4-Methyl-2-Pentanone	43	6.933	6.929	(0.839)	206210	37.8513	37.85
	46 cis-1,3-Dichloropropene	75	6.771	6.772	(1.200)	158614	20.3997	20.39
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	627550	50.0000	
$	48 Toluene-d8	98	7.011	7.012	(0.848)	825356	52.1724	52.17
	50 Toluene	91	7.071	7.072	(0.855)	361735	19.5571	19.55
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	134727	19.7184	19.71
	52 2-Hexanone	43	7.664	7.664	(0.927)	159567	40.3403	40.34
	53 1,1,2-Trichloroethane	83	7.427	7.428	(0.898)	72126	19.4858	19.48
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	151632	19.9425	19.94
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	90940	18.8286	18.82
	56 Tetrachloroethene	164	7.555	7.551	(0.914)	69804	18.1822	18.18
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	86036	18.9860	18.98
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	74299	18.4205	18.42
	59 Chlorobenzene	112	8.293	8.294	(1.003)	226123	17.9125	17.91
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	84005	18.5727	18.57
	61 Ethylbenzene	106	8.391	8.391	(1.015)	112022	18.1172	18.11
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	280903	36.9012	36.90
	63 o-Xylene	106	8.833	8.833	(1.068)	142944	18.8009	18.80
	64 Styrene	104	8.841	8.841	(1.069)	248183	17.9726	17.97
	66 Bromoform	173	8.994	8.991	(1.088)	69202	19.6377	19.63
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	323315	17.1379	17.13
	68 1,1,2,2-Tetrachloroethane	83	9.399	9.399	(0.917)	128183	19.7634	19.76
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	302312	48.4466	48.44
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	393141	50.0000	
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	138245	16.5423	16.54
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	395996	18.4659	18.46
	74 Bromobenzene	156	9.399	9.399	(0.917)	116889	19.4806	19.48
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	292227	18.2480	18.24
	76 2-Chlorotoluene	91	9.564	9.568	(0.933)	263558	19.9819	19.98
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	314292	18.7692	18.76
	78 tert-Butylbenzene	119	9.920	9.924	(0.968)	234657	16.9889	16.98
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	317607	18.2511	18.25
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	329517	16.9733	16.97
	82 p-Isopropyltoluene	119	10.231	10.232	(0.998)	307328	17.4032	17.40
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	212070	17.6622	17.66
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	226142	20.1950	20.19
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	292691	17.2850	17.28
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	218910	19.9655	19.96

89	1,2-Dibromo-3-Chloropropane	155	11.240	11.236 (1.097)	21953	18.0628	18.06
90	1,2,4-Trichlorobenzene	180	11.937	11.934 (1.165)	165099	19.8619	19.86

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	74026	23.4844	23.48
	92 Naphthalene	128	12.143	12.140	(1.185)	409167	18.5042	18.50
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	153048	19.7608	19.76
M	94 1,2-Dichloroethylene (total)	96				168149	42.3305	42.33
M	95 Xylenes (total)	106				423847	55.7021	55.70
	135 1,4-Dioxane	88	6.247	6.247	(1.271)	20397	366.038	366.03
	141 Cyclohexane	56	4.912	4.912	(0.999)	113945	27.9107	27.91
	138 Freon TF	101	2.446	2.449	(0.498)	40461	17.1604	17.16
	147 Methylcyclohexane	55	6.067	6.067	(1.075)	94266	14.0409	14.04
	146 Methyl Acetate	43	2.809	2.813	(0.571)	58014	14.9397	14.93
	148 Tert-Butyl alcohol	59	3.042	3.042	(0.619)	161526	272.020	272.02
	149 Isopropyl Alcohol	45	2.633	2.637	(0.536)	82781	197.646	197.64
	72 trans-1,4-Dichloro-2-butene	53	9.444	9.444	(1.142)	41488	18.1111	18.11
	12 Isobutyl Alcohol	43	5.377	5.377	(1.094)	274784	371.783	371.78
	13 Acetonitrile	39	2.775	2.776	(0.565)	98103	147.952	147.95
	14 Allyl Chloride	41	2.779	2.776	(0.565)	125907	12.4270	12.42
	25 Methacrylonitrile	41	4.571	4.575	(0.930)	92226	23.3499	23.34
	40 Methyl Methacrylate	41	6.239	6.239	(1.269)	92859	19.6409	19.64
	4 Propionitrile	54	4.406	4.406	(0.896)	157940	229.121	229.12(a)
	23 Chloroprene	53	3.735	3.735	(0.760)	132782	22.6967	22.69
	49 Ethyl Methacrylate	69	6.235	6.239	(1.105)	60705	19.3644	19.36

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Client ID: VLCSW-221113
Sample Info: VLCSW-221113;VLCSW-221113;3;;LCS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Page 1

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111305.D
Inj Date : 13-NOV-2022 12:36
InstruID : voa10.i
LabSampID : VLCSW-221113

1,1-Dichloroethene (75-35-4)

Reason Code:

BEFORE

MASS
96
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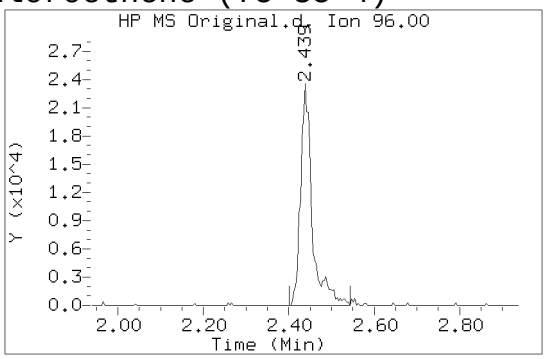
45600
HEIGHT
23552
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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HEIGHT
23552
18-Nov-2022
14:12
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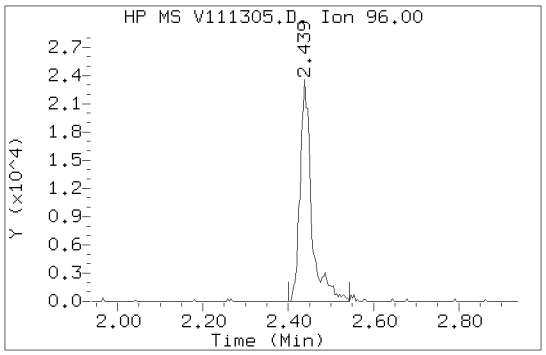

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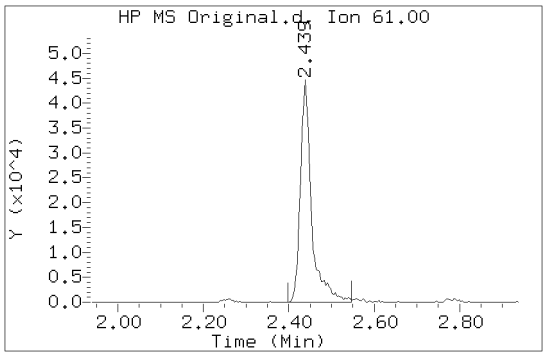

AFTER

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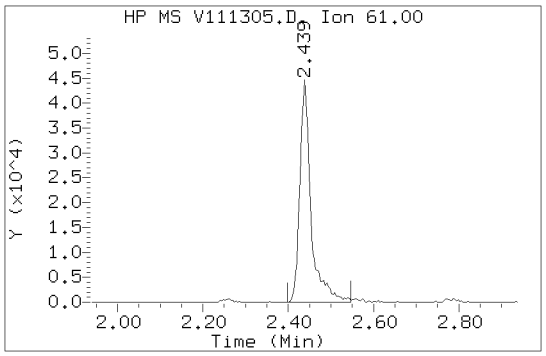

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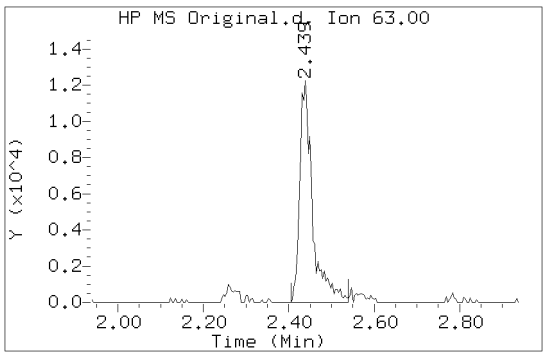

AFTER

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14:12
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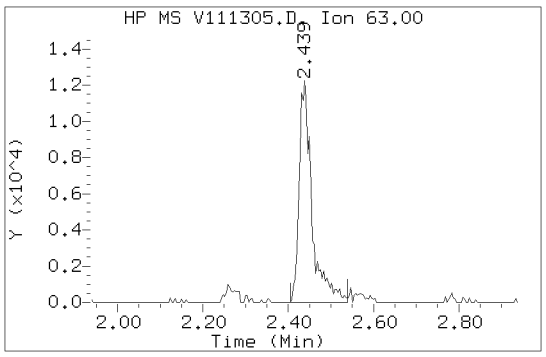

Vinyl Acetate (108-05-4)

Reason Code:

BEFORE

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17-Nov-2022
13:52
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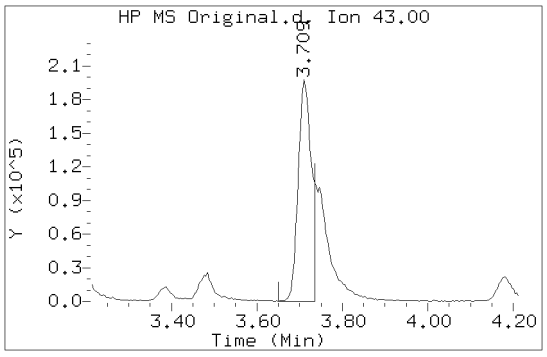

AFTER

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HEIGHT
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18-Nov-2022
14:12
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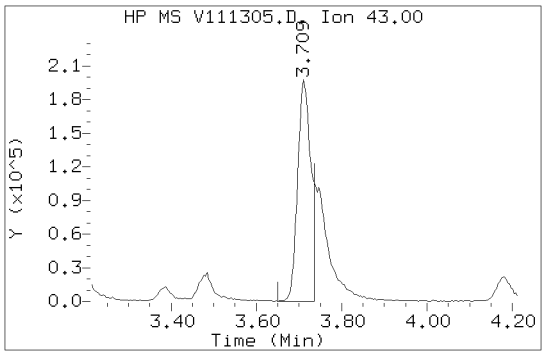
pham



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Inj Date : 13-NOV-2022 12:36
InstruID : voa10.i
LabSampID : VLCSW-221113

Vinyl Acetate (108-05-4)

Reason Code:

BEFORE

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HEIGHT
13391
17-Nov-2022
13:52
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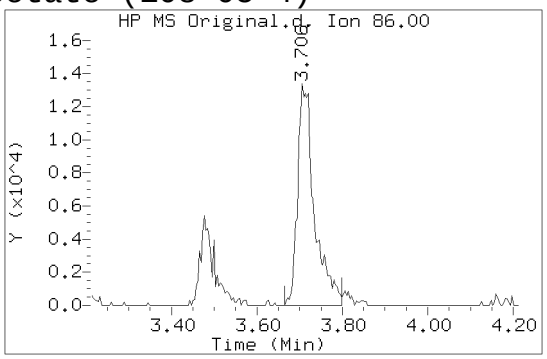
pham



AFTER

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18-Nov-2022
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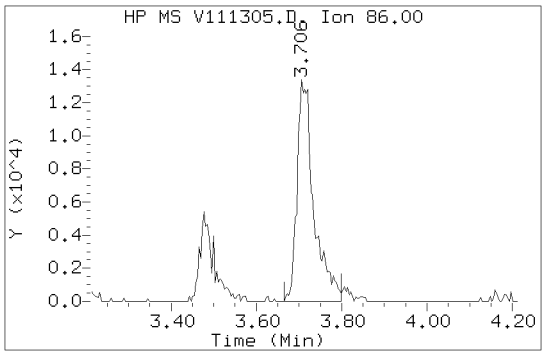


Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111307.D Page 1
Report Date: 18-Nov-2022 12:49

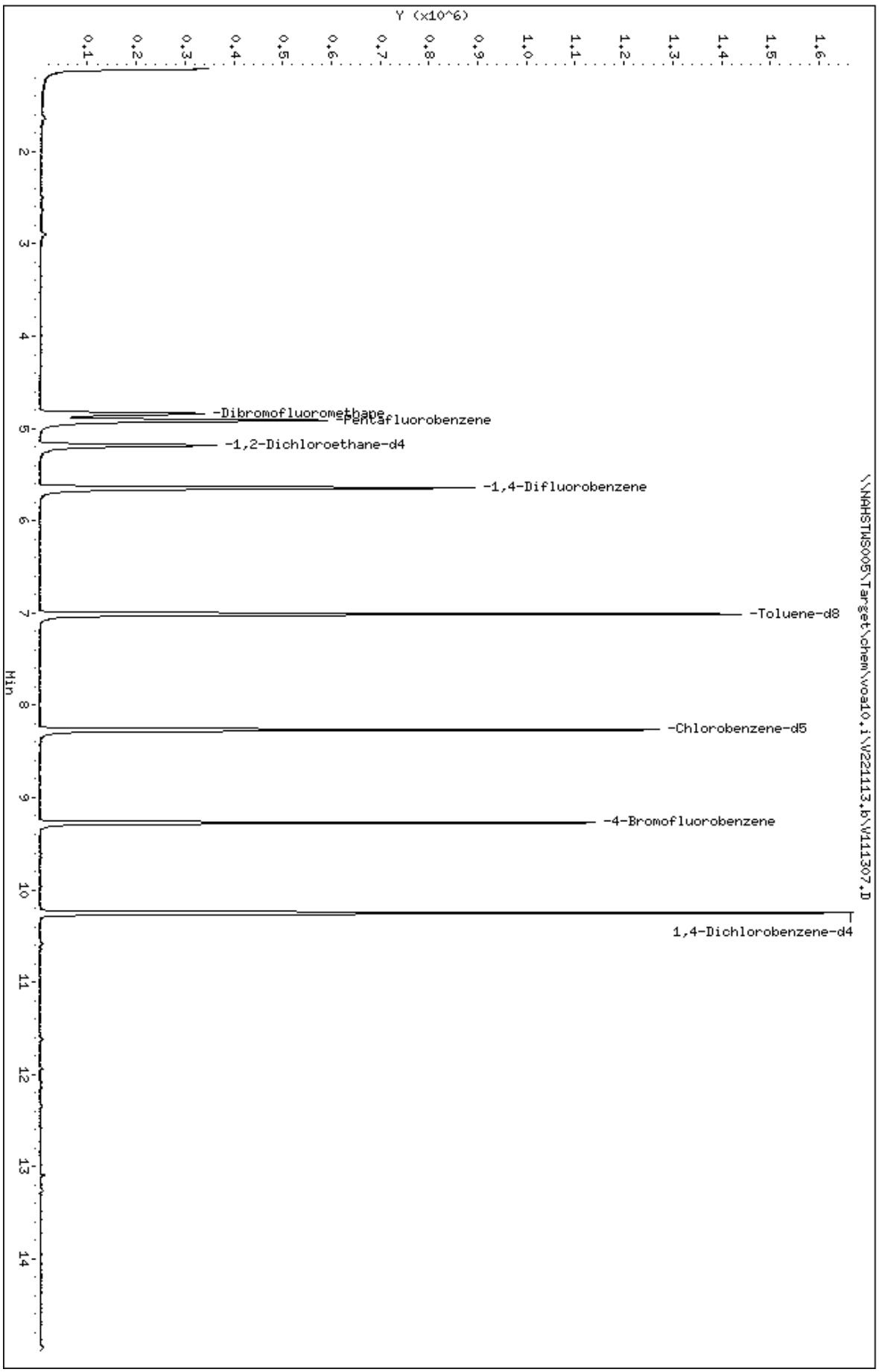
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111307.D
Lab Smp Id: VBLKW-221113 Client Smp ID: VBLKW-221113
Inj Date : 13-NOV-2022 13:17
Operator : PC Inst ID: voa10.i
Smp Info : VBLKW-221113;VBLKW-221113;3;;BLANK
Misc Info : V10;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	495557	50.0000	
$ 30 Dibromofluoromethane	113	4.837	4.845	(0.985)	236709	56.5348	56.53
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	291634	54.8468	54.84
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	757916	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	647379	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	850422	52.1106	52.11
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	315524	49.0041	49.00
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	406221	50.0000	



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Date : 13-NOV-2022 13:17
Client ID: VBLKW-221113
Sample Info: VBLKW-221113;VBLKW-221113;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10,i
Operator: PC
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111307.D
Inj Date : 13-NOV-2022 13:17
InstruID : voa10.i
LabSampID : VBLKW-221113

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111309.D Page 1
Report Date: 18-Nov-2022 14:12

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111309.D
Lab Smp Id: HS22110430-06MS Client Smp ID: HS22110430-06MS
Inj Date : 13-NOV-2022 13:58
Operator : PC Inst ID: voa10.i
Smp Info : HS22110430-06MS;HS22110430-06MS;3;;MS
Misc Info : V10;WATER;0;5;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 14:11 Linh.Pham Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 9 QC Sample: MS
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	5.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	513101	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	90370	20.5704	102.85
3	Chloromethane	50	1.370	1.370	(0.279)	100552	20.9704	104.85
5	Vinyl Chloride	62	1.449	1.452	(0.295)	103949	21.8290	109.14
6	Bromomethane	94	1.696	1.700	(0.345)	37376	17.3899	86.94
7	Chloroethane	64	1.782	1.786	(0.363)	65147	23.7512	118.75
8	Trichlorofluoromethane	101	1.992	1.996	(0.405)	132772	21.2178	106.08
9	Acrolein	56	2.352	2.344	(0.478)	6190	28.9137	144.56
10	Acetone	43	2.494	2.491	(0.507)	107877	48.7067	243.53
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	93297	30.8566	154.28
15	Iodomethane	142	2.569	2.569	(0.523)	138404	37.7125	188.56
16	Acrylonitrile	53	3.143	3.147	(0.639)	65658	34.6961	173.48
17	Methylene Chloride	84	2.896	2.896	(0.589)	94347	27.2541	136.27
18	Methyl tert-butyl ether	73	3.192	3.195	(0.649)	241417	18.4179	92.08
19	Carbon Disulfide	76	2.629	2.633	(0.535)	525686	59.3867	296.93
20	trans-1,2-Dichloroethene	96	3.177	3.173	(0.646)	90432	23.0412	115.20
21	Vinyl Acetate	43	3.709	3.713	(0.754)	301334	28.9564	144.78(M)
22	1,1-Dichloroethane	63	3.630	3.630	(0.738)	122039	17.1786	85.89
24	2-Butanone	43	4.358	4.350	(0.886)	101653	38.2055	191.02
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	160317	25.8145	129.07

27 cis-1,2-Dichloroethene	96	4.309	4.305 (0.876)	109674	23.5103	117.55
28 Chloroform	83	4.672	4.672 (0.950)	181945	21.5847	107.92

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	29 Bromochloromethane	128	4.567	4.571	(0.929)	54149	23.2004	116.00
$	30 Dibromofluoromethane	113	4.837	4.845	(0.984)	228119	52.6203	52.62
	31 1,1,1-Trichloroethane	97	4.860	4.856	(0.989)	165270	24.4039	122.01
	32 1,1-Dichloropropene	75	5.029	5.036	(0.891)	156900	26.5017	132.50
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	145877	20.5477	102.73
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	134420	26.2413	131.20
$	35 1,2-Dichloroethane-d4	65	5.190	5.186	(1.056)	281476	51.1264	51.12
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	768253	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	438894	22.4418	112.20
	38 Trichloroethene	130	5.887	5.887	(1.043)	442637	88.4413	442.20
	39 Bromodichloromethane	83	6.359	6.359	(1.127)	130737	21.4308	107.15
	41 2-Chloroethylvinyl ether	63	6.652	6.652	(1.179)	75518	36.4201	182.10
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	115116	21.0660	105.32
	44 Dibromomethane	93	6.202	6.198	(1.099)	63902	20.4271	102.13
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	210668	37.9663	189.83
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.200)	175678	21.5474	107.73
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	639016	50.0000	
$	48 Toluene-d8	98	7.012	7.012	(0.848)	875300	54.3252	54.32
	50 Toluene	91	7.068	7.072	(0.855)	441225	23.4267	117.13
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	146497	20.4475	102.23
	52 2-Hexanone	43	7.664	7.664	(0.927)	160824	39.9461	199.73
	53 1,1,2-Trichloroethane	83	7.431	7.428	(0.899)	77690	20.6124	103.06
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	163212	21.0803	105.40
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	98789	20.0867	100.43
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	100637	25.7430	128.71
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	92691	20.0876	100.43
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	111551	26.3747	131.87
	59 Chlorobenzene	112	8.290	8.294	(1.003)	271178	21.0962	105.48
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	93740	20.3532	101.76
	61 Ethylbenzene	106	8.391	8.391	(1.015)	144712	22.9841	114.92
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	361897	46.6880	233.43
	63 o-Xylene	106	8.830	8.833	(1.068)	173068	22.3546	111.77
	64 Styrene	104	8.841	8.841	(1.069)	301061	21.4107	107.05
	66 Bromoform	173	8.991	8.991	(1.088)	72450	20.1578	100.78
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	445107	23.1703	115.85
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.399	(0.917)	134171	19.6079	98.03
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	322137	50.6536	50.65
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	414741	50.0000	
	71 1,2,3-Trichloropropane	75	9.437	9.433	(0.921)	154612	17.5372	87.68
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	548908	24.2633	121.31
	74 Bromobenzene	156	9.399	9.399	(0.917)	131308	20.7440	103.71
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	389890	23.0786	115.39
	76 2-Chlorotoluene	91	9.564	9.568	(0.933)	323830	23.0413	115.20
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	386505	21.8796	109.39
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	334270	22.9403	114.70
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	396119	21.5772	107.88
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	481349	23.5028	117.51
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	437320	23.4746	117.37
	83 1,3-Dichlorobenzene	146	10.194	10.198	(0.995)	255807	20.1952	100.97
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	263362	22.2339	111.16
	87 n-Butylbenzene	91	10.577	10.576	(1.032)	412036	23.0657	115.32
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	246190	21.2848	106.42

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	23040	17.9699	89.84
90	1,2,4-Trichlorobenzene	180	11.937	11.934 (1.165)	188988	21.5478	107.73

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111309.D Page 3
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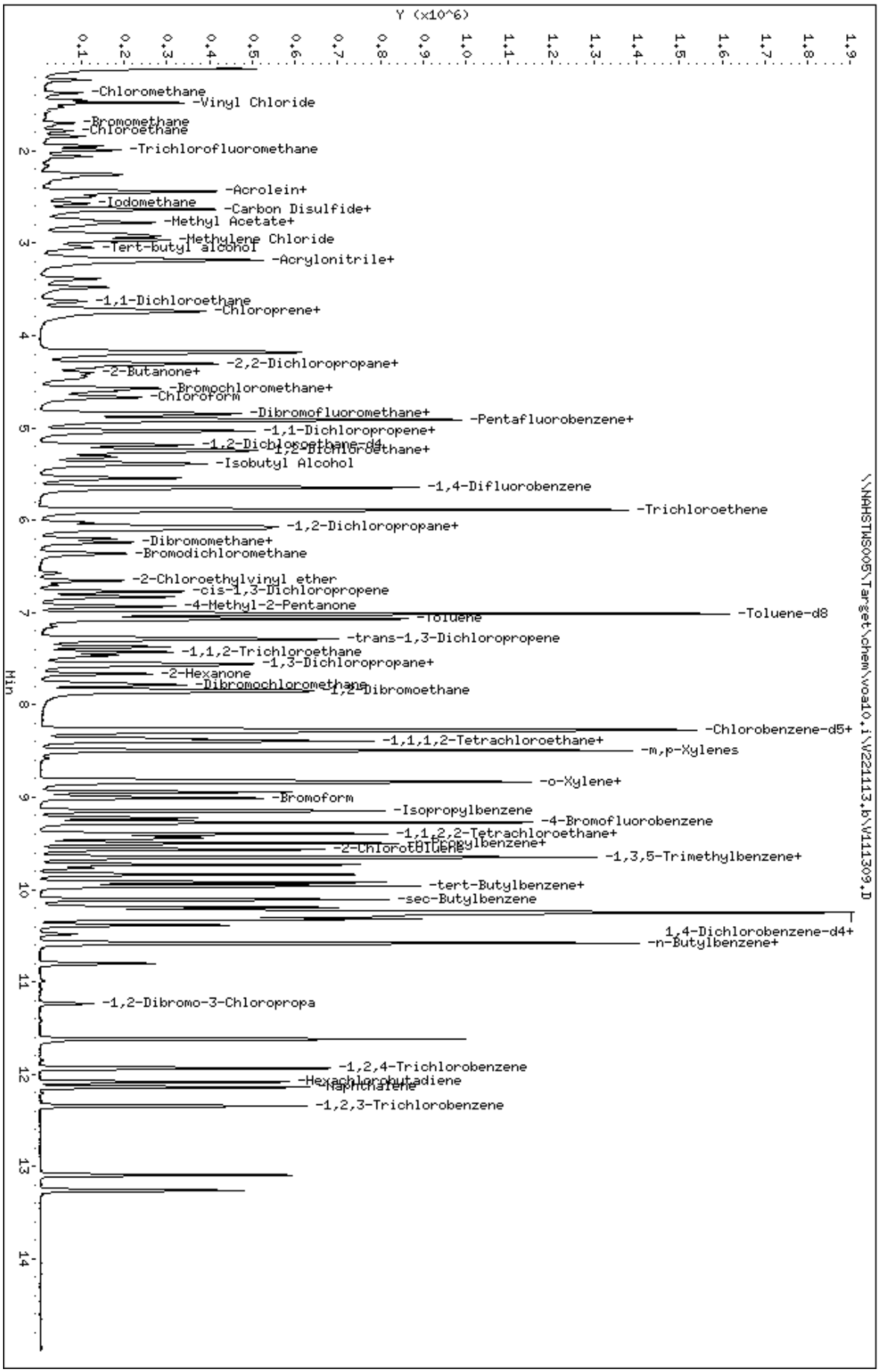
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	99596	29.8147	149.07
	92 Naphthalene	128	12.143	12.140	(1.185)	424530	18.1991	90.99
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	171572	21.0151	105.07
M	94 1,2-Dichloroethylene (total)	96				200106	46.5516	232.75
M	95 Xylenes (total)	106				534965	69.0426	345.21
	135 1,4-Dioxane	88	6.251	6.247	(1.271)	19730	328.575	1642.87
	141 Cyclohexane	56	4.912	4.912	(0.999)	189971	41.5475	207.73
	138 Freon TF	101	2.449	2.449	(0.498)	101039	38.5467	192.73
	147 Methylcyclohexane	55	6.063	6.067	(1.074)	182940	25.9862	129.93
	146 Methyl Acetate	43	2.809	2.813	(0.572)	94093	22.3851	111.92
	148 Tert-Butyl alcohol	59	3.045	3.042	(0.620)	151789	236.152	1180.76
	149 Isopropyl Alcohol	45	2.637	2.637	(0.536)	119773	264.186	1320.92
	72 trans-1,4-Dichloro-2-butene	53	9.448	9.444	(1.143)	42605	18.2650	91.32
	12 Isobutyl Alcohol	43	5.377	5.377	(1.094)	287290	359.097	1795.48
	13 Acetonitrile	39	2.776	2.776	(0.565)	149495	208.286	1041.42
	14 Allyl Chloride	41	2.776	2.776	(0.565)	312771	28.5192	142.59
	25 Methacrylonitrile	41	4.575	4.575	(0.931)	83804	19.6015	98.00
	40 Methyl Methacrylate	41	6.239	6.239	(1.269)	98358	19.2194	96.09
	4 Propionitrile	54	4.403	4.406	(0.896)	139997	187.623	938.11(a)
	23 Chloroprene	53	3.739	3.735	(0.761)	122814	19.3939	96.96
	49 Ethyl Methacrylate	69	6.239	6.239	(1.106)	62050	18.8762	94.38

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Sample Info: HS22110430-06MS;HS22110430-06MS;3;;MS
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

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Inj Date : 13-NOV-2022 13:58
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LabSampID : HS22110430-06MS

Vinyl Acetate (108-05-4)

Reason Code:

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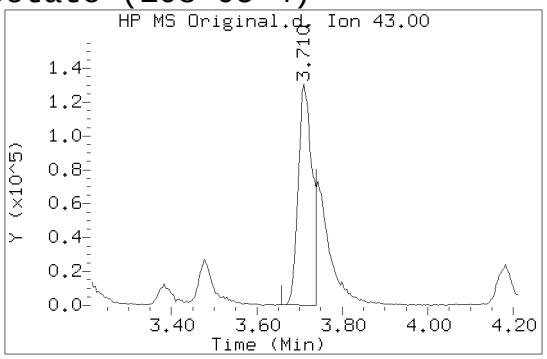

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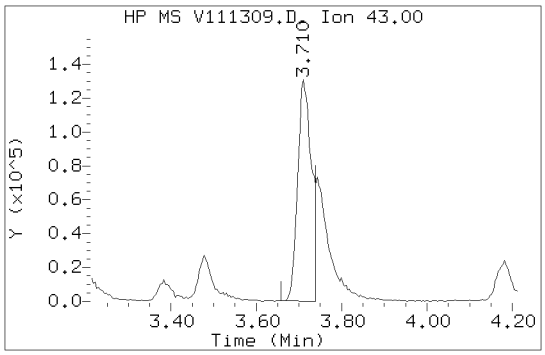

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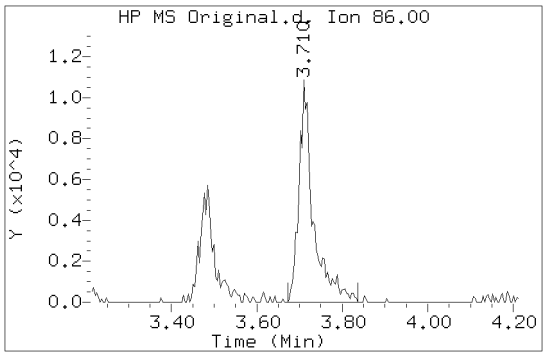

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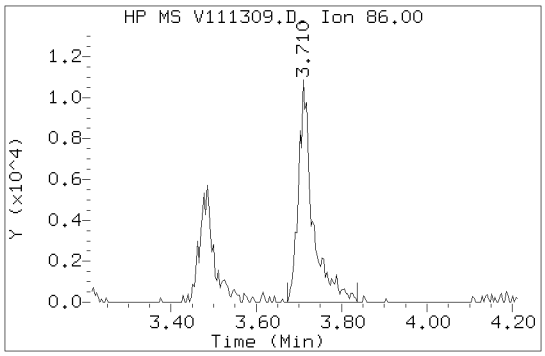

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Report Date: 18-Nov-2022 14:12

ALS Laboratory Group

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Inj Date : 13-NOV-2022 14:18
Operator : PC Inst ID: voa10.i
Smp Info : HS22110430-06MSD;HS22110430-06MSD;3;;MSD
Misc Info : V10;WATER;0;5;
Comment   :
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Meth Date : 18-Nov-2022 14:11 Linh.Pham Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 9 QC Sample: MSD
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	5.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1	Pentafluorobenzene	168	4.912	4.916	(1.000)	505260	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	86398	19.9714	99.85
3	Chloromethane	50	1.370	1.370	(0.279)	103321	21.8822	109.41
5	Vinyl Chloride	62	1.448	1.452	(0.295)	102743	21.9106	109.55
6	Bromomethane	94	1.696	1.700	(0.345)	37861	17.8889	89.44
7	Chloroethane	64	1.782	1.786	(0.363)	59924	22.1860	110.93
8	Trichlorofluoromethane	101	1.988	1.996	(0.405)	147361	23.9147	119.57
9	Acrolein	56	2.344	2.344	(0.477)	7871	37.8137	189.06
10	Acetone	43	2.487	2.491	(0.506)	112755	52.0335	260.16
11	1,1-Dichloroethene	96	2.434	2.438	(0.496)	86989	29.2732	146.36
15	Iodomethane	142	2.569	2.569	(0.523)	147841	40.5103	202.55
16	Acrylonitrile	53	3.143	3.147	(0.640)	75227	40.3697	201.84
17	Methylene Chloride	84	2.895	2.896	(0.589)	93046	27.2997	136.49
18	Methyl tert-butyl ether	73	3.195	3.195	(0.651)	246171	19.0720	95.36
19	Carbon Disulfide	76	2.633	2.633	(0.536)	469534	53.9156	269.57
20	trans-1,2-Dichloroethene	96	3.165	3.173	(0.644)	86797	22.4583	112.29
21	Vinyl Acetate	43	3.709	3.713	(0.755)	444372	43.3642	216.82(M)
22	1,1-Dichloroethane	63	3.626	3.630	(0.738)	130296	18.6484	93.24
24	2-Butanone	43	4.350	4.350	(0.886)	110732	42.2636	211.31
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	151682	24.8032	124.01

27 cis-1,2-Dichloroethene	96	4.305	4.305 (0.876)	107028	23.2992	116.49
28 Chloroform	83	4.669	4.672 (0.950)	175555	21.1499	105.74

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111310.D Page 2
Report Date: 18-Nov-2022 14:12

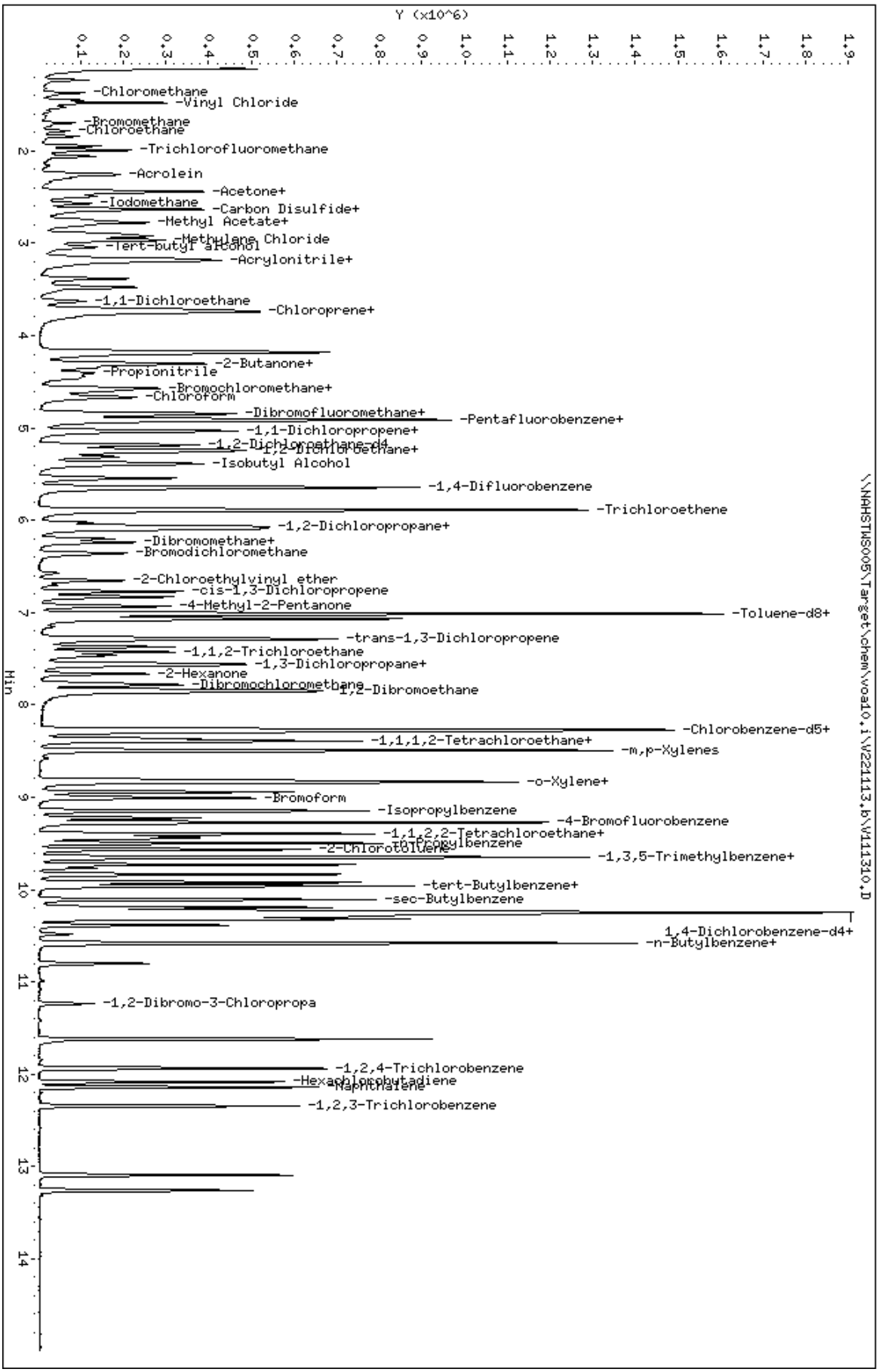
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	29 Bromochloromethane	128	4.567	4.571	(0.930)	55105	23.9764	119.88
$	30 Dibromofluoromethane	113	4.841	4.845	(0.986)	224532	52.5966	52.59
	31 1,1,1-Trichloroethane	97	4.860	4.856	(0.989)	157840	23.6684	118.34
	32 1,1-Dichloropropene	75	5.032	5.036	(0.892)	148859	25.4207	127.10
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	149675	21.3151	106.57
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	123497	24.3747	121.87
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	288763	53.2640	53.26
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	759875	50.0000	
	37 Benzene	78	5.238	5.242	(0.928)	427783	22.1149	110.57
	38 Trichloroethene	130	5.887	5.887	(1.043)	424689	85.7907	428.95
	39 Bromodichloromethane	83	6.355	6.359	(1.126)	126455	20.9574	104.78
	41 2-Chloroethylvinyl ether	63	6.652	6.652	(1.179)	75568	36.8460	184.23
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	118618	21.9462	109.73
	44 Dibromomethane	93	6.202	6.198	(1.099)	61044	19.7286	98.64
	45 4-Methyl-2-Pentanone	43	6.933	6.929	(0.839)	207482	37.1147	185.57
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.200)	176525	21.8900	109.44
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	645008	50.0000	
$	48 Toluene-d8	98	7.011	7.012	(0.848)	876226	53.8797	53.87
	50 Toluene	91	7.068	7.072	(0.855)	421989	22.1972	110.98
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	142391	20.0935	100.46
	52 2-Hexanone	43	7.664	7.664	(0.927)	159077	39.1795	195.89
	53 1,1,2-Trichloroethane	83	7.431	7.428	(0.899)	78225	20.5615	102.80
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	159522	20.4123	102.06
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	97372	19.6147	98.07
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	93309	23.6468	118.23
	57 1,2-Dibromoethane	107	7.859	7.862	(0.951)	94181	20.2209	101.10
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	103303	24.6939	123.46
	59 Chlorobenzene	112	8.293	8.294	(1.003)	259150	19.9732	99.86
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	92758	19.9529	99.76
	61 Ethylbenzene	106	8.391	8.391	(1.015)	137848	21.6905	108.45
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	339301	43.3663	216.83
	63 o-Xylene	106	8.830	8.833	(1.068)	167734	21.4643	107.32
	64 Styrene	104	8.841	8.841	(1.069)	290894	20.4954	102.47
	66 Bromoform	173	8.991	8.991	(1.088)	69924	19.3251	96.62
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	425587	21.9484	109.74
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.399	(0.917)	137297	20.0375	100.18
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	320388	49.9244	49.92
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	415382	50.0000	
	71 1,2,3-Trichloropropane	75	9.429	9.433	(0.920)	161811	18.3254	91.62
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	520222	22.9598	114.79
	74 Bromobenzene	156	9.399	9.399	(0.917)	128787	20.3143	101.57
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	371571	21.9603	109.80
	76 2-Chlorotoluene	91	9.564	9.568	(0.933)	312375	22.2438	111.21
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	373326	21.1009	105.50
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	320790	21.9812	109.90
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	390468	21.2366	106.18
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	464699	22.6548	113.27
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	417785	22.3913	111.95
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	246509	19.4311	97.15
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	256558	21.6418	108.20
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	401345	22.4326	112.16
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	244207	21.0807	105.40

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	24480	19.0636	95.31
90	1,2,4-Trichlorobenzene	180	11.937	11.934 (1.165)	186864	21.2733	106.36

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	98021	29.3152	146.57
	92 Naphthalene	128	12.143	12.140	(1.185)	431331	18.4621	92.31
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	169150	20.6824	103.41
M	94 1,2-Dichloroethylene (total)	96				193825	45.7574	228.78
M	95 Xylenes (total)	106				507035	64.8306	324.15
	135 1,4-Dioxane	88	6.247	6.247	(1.272)	20525	346.336	1731.68
	141 Cyclohexane	56	4.916	4.912	(1.001)	184599	41.0594	205.29
	138 Freon TF	101	2.449	2.449	(0.499)	95201	37.0232	185.11
	147 Methylcyclohexane	55	6.063	6.067	(1.074)	177038	25.4251	127.12
	146 Methyl Acetate	43	2.805	2.813	(0.571)	91441	22.0918	110.45
	148 Tert-Butyl alcohol	59	3.042	3.042	(0.619)	170888	269.992	1349.96
	149 Isopropyl Alcohol	45	2.637	2.637	(0.537)	122395	274.159	1370.79
	72 trans-1,4-Dichloro-2-butene	53	9.444	9.444	(1.142)	42612	18.0983	90.49
	12 Isobutyl Alcohol	43	5.377	5.377	(1.095)	278049	352.940	1764.69
	13 Acetonitrile	39	2.775	2.776	(0.565)	144117	203.909	1019.54
	14 Allyl Chloride	41	2.772	2.776	(0.564)	308721	28.5868	142.93
	25 Methacrylonitrile	41	4.571	4.575	(0.931)	88013	20.9054	104.52
	40 Methyl Methacrylate	41	6.239	6.239	(1.270)	93347	18.5233	92.61
	4 Propionitrile	54	4.402	4.406	(0.896)	149273	203.159	1015.79(a)
	23 Chloroprene	53	3.731	3.735	(0.760)	168378	27.0016	135.00
	49 Ethyl Methacrylate	69	6.235	6.239	(1.105)	63219	19.4439	97.21

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Date : 13-NOV-2022 14:18
Client ID: HS2211043O-06HSD
Sample Info: HS2211043O-06HSD;HS2211043O-06HSD;3;;HSD
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10,i
Operator: PC
Column diameter: 0.18

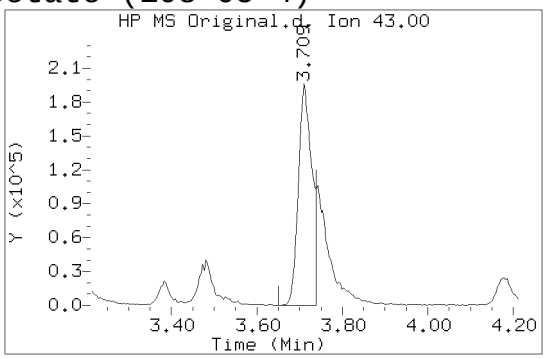
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111310.D
Inj Date : 13-NOV-2022 14:18
InstruID : voa10.i
LabSampID : HS22110430-06MSD

Vinyl Acetate (108-05-4)

Reason Code:

BEFORE

MASS
43
AREA
444372
HEIGHT
196288
17-Nov-2022
13:52
linh
pham



AFTER

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HEIGHT
196288
18-Nov-2022
14:12
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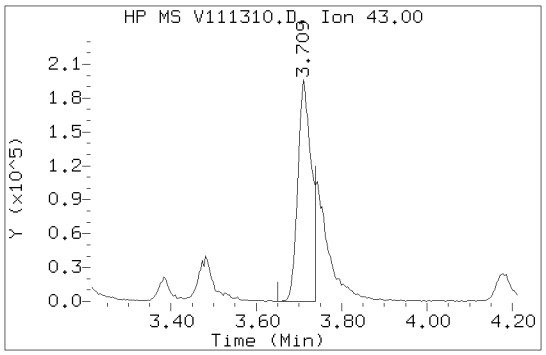
pham



BEFORE

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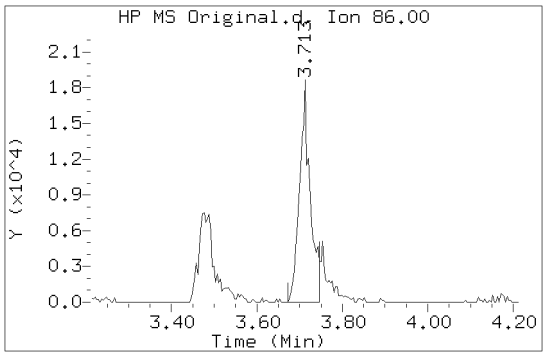
AREA
32884
HEIGHT
18656
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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HEIGHT
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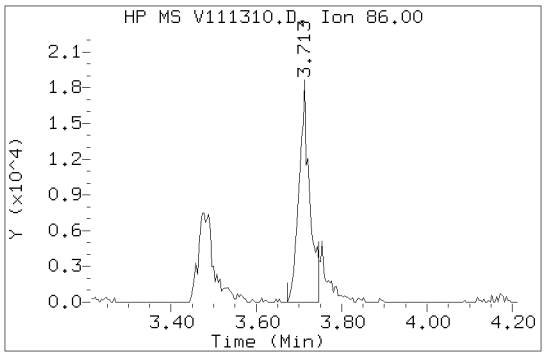
18-Nov-2022
14:12
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111315.D Page 1
Report Date: 18-Nov-2022 12:50

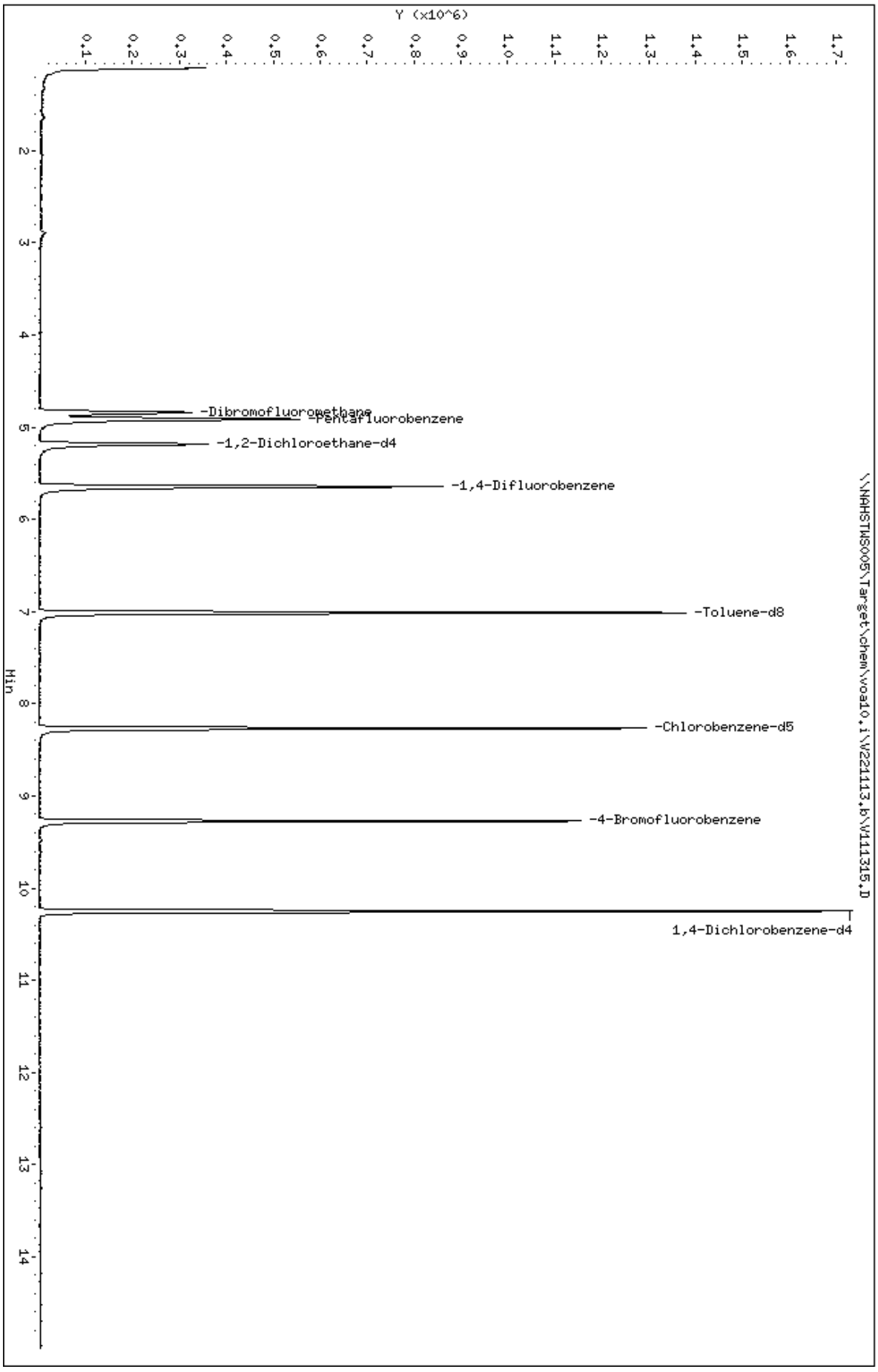
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111315.D
Lab Smp Id: HS22110553-14 Client Smp ID: HS22110553-14
Inj Date : 13-NOV-2022 16:01
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-14;HS22110553-14;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 14
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	467386	50.0000	
$ 30 Dibromofluoromethane	113	4.837	4.845	(0.984)	232846	58.9641	58.96
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	284504	56.7309	56.73
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	717865	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	636976	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	824237	51.3351	51.33
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	313066	49.4085	49.40
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	400173	50.0000	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Date : 13-NOV-2022 16:01
Client ID: HS22110553-14
Sample Info: HS22110553-14;HS22110553-14;;;
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10.i
Operator: PC
Column diameter: 0.18
Page 1
Y (x10^6)
Min
-Dibromofluoromethane
-Pentafluorobenzene
-1,2-Dichloroethane-d4
-1,4-Difluorobenzene
-Toluene-d8
-Chlorobenzene-d5
-4-Bromofluorobenzene
1,4-Dichlorobenzene-d4
\\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111315.D

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111315.D
Inj Date : 13-NOV-2022 16:01
InstruID : voa10.i
LabSampID : HS22110553-14

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111317.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111317.D
Lab Smp Id: HS22110553-01 Client Smp ID: HS22110553-01
Inj Date : 13-NOV-2022 16:42
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-01;HS22110553-01;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

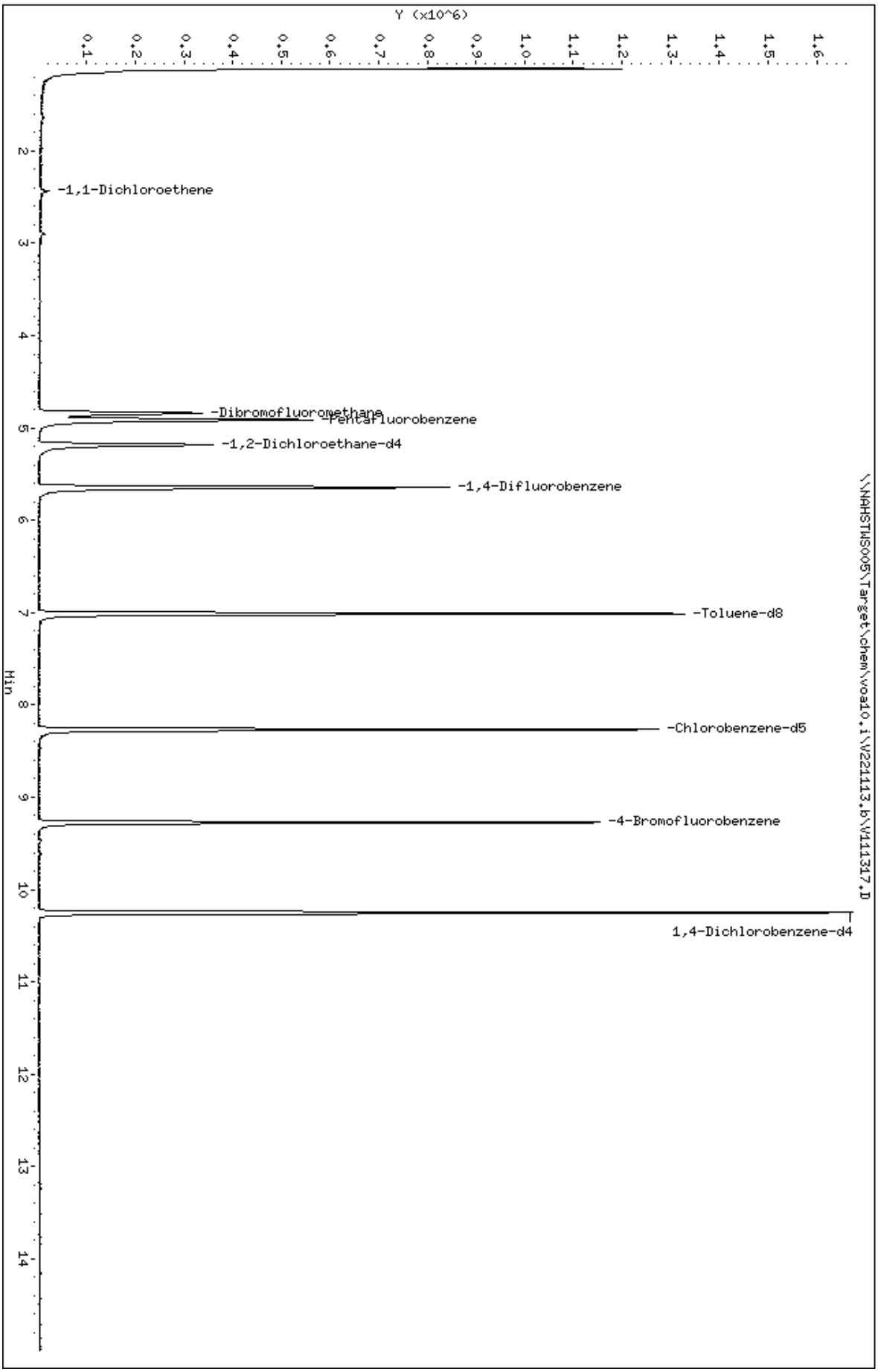
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	456203	50.0000	
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	5633	1.17770	1.17(a)
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.986)	226642	58.7999	58.79(M)
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	281273	57.4615	57.46
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	701483	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	636455	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	817660	50.9692	50.96
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	315997	49.9023	49.90
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	406522	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111317.D
Date : 13-NOV-2022 16:42
Client ID: HS22110553-01
Sample Info: HS22110553-01;HS22110553-01;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111317.D Page 2

Date : 13-NOV-2022 16:42

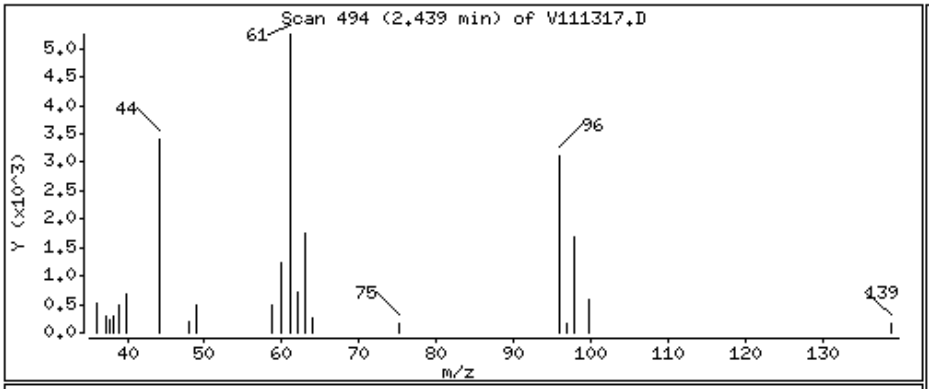
Client ID: HS22110553-01 Instrument: voa10.i

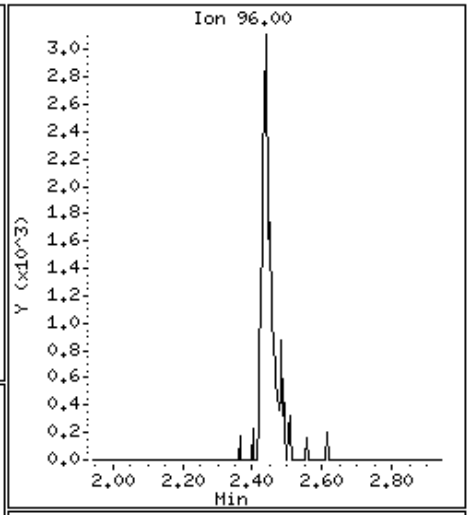
Sample Info: HS22110553-01;HS22110553-01;;;

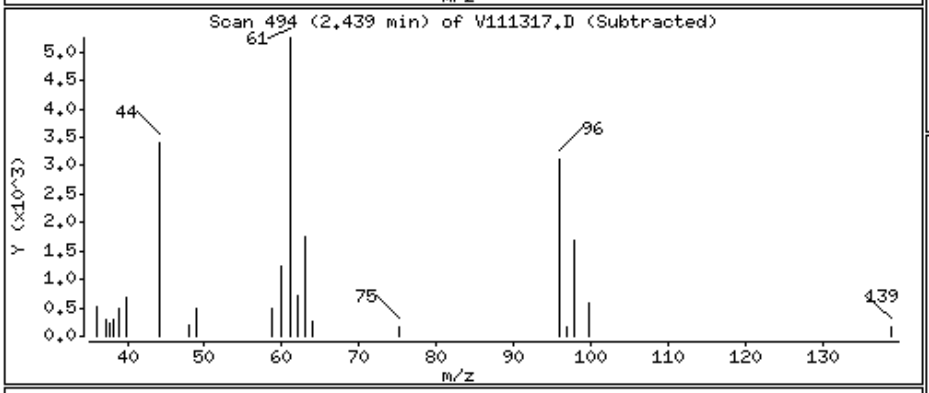
Purge Volume: 5.0 Operator: PC

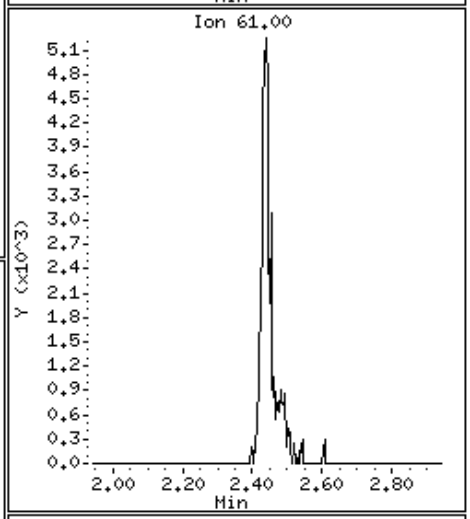
Column phase: DB624 Column diameter: 0.18

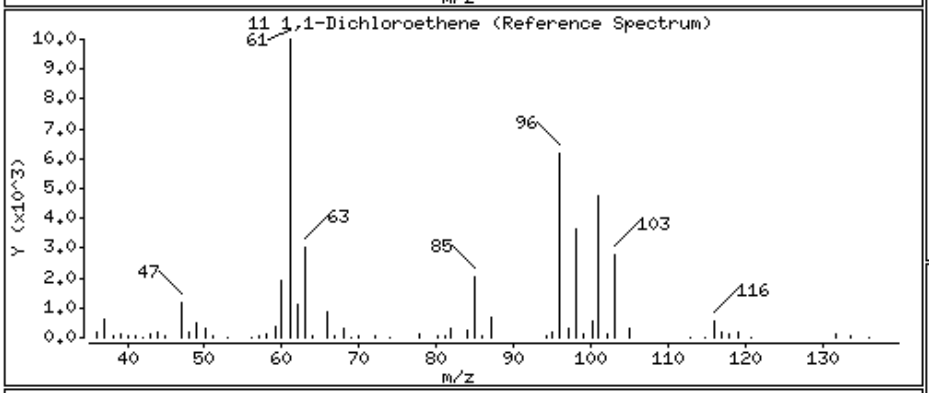
11 1,1-Dichloroethene Concentration: 1.17 ug/l

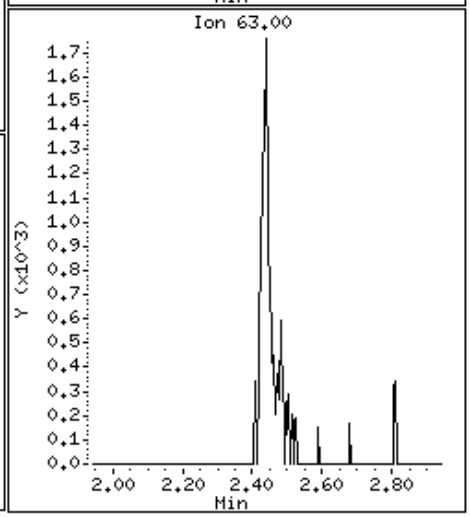


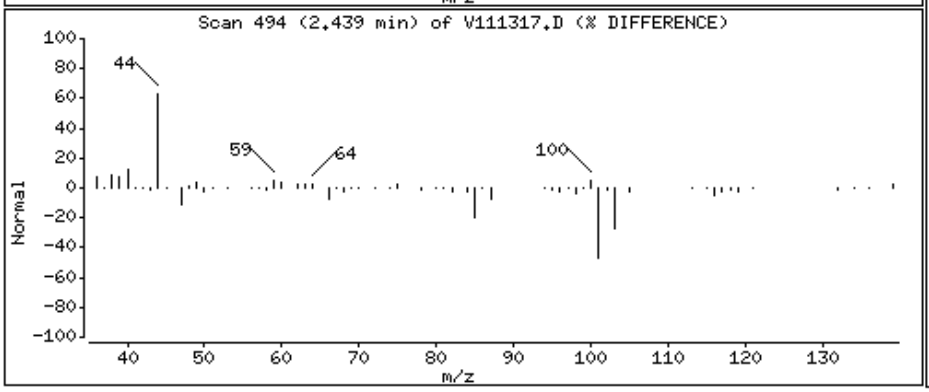












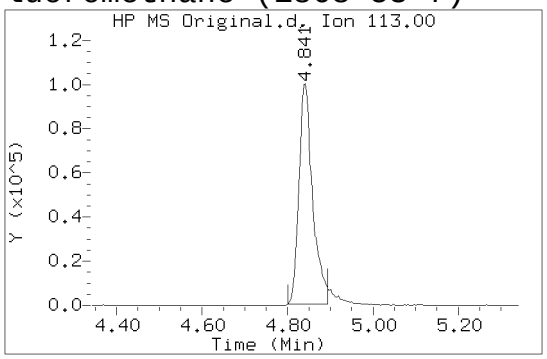
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111317.D
Inj Date : 13-NOV-2022 16:42
InstruID : voa10.i
LabSampID : HS22110553-01

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

MASS
113
AREA
226642
HEIGHT
99915
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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HEIGHT
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18-Nov-2022
12:49
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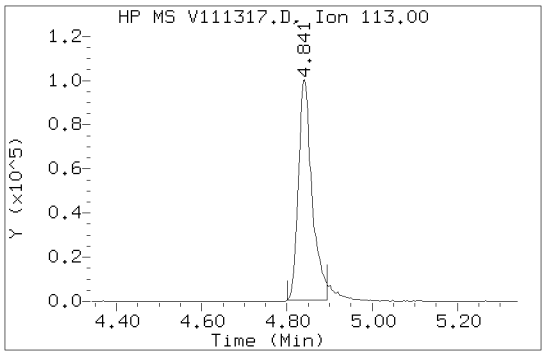
pham



BEFORE

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HEIGHT
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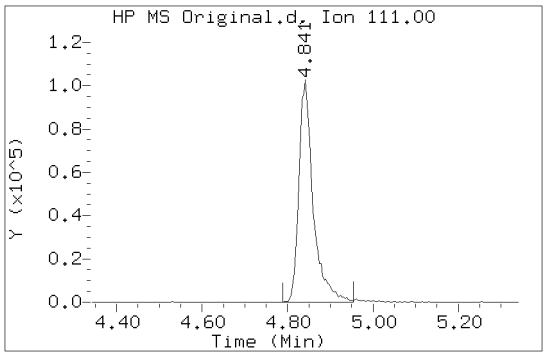
17-Nov-2022
13:52
linh
pham



AFTER

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HEIGHT
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18-Nov-2022
12:49
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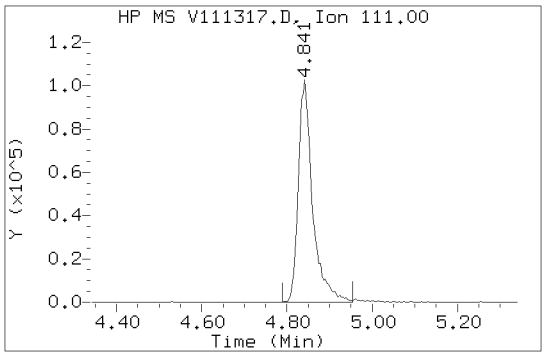
pham



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Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111318.D
Lab Smp Id: HS22110553-02 Client Smp ID: HS22110553-02
Inj Date : 13-NOV-2022 17:02
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-02;HS22110553-02;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 17
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

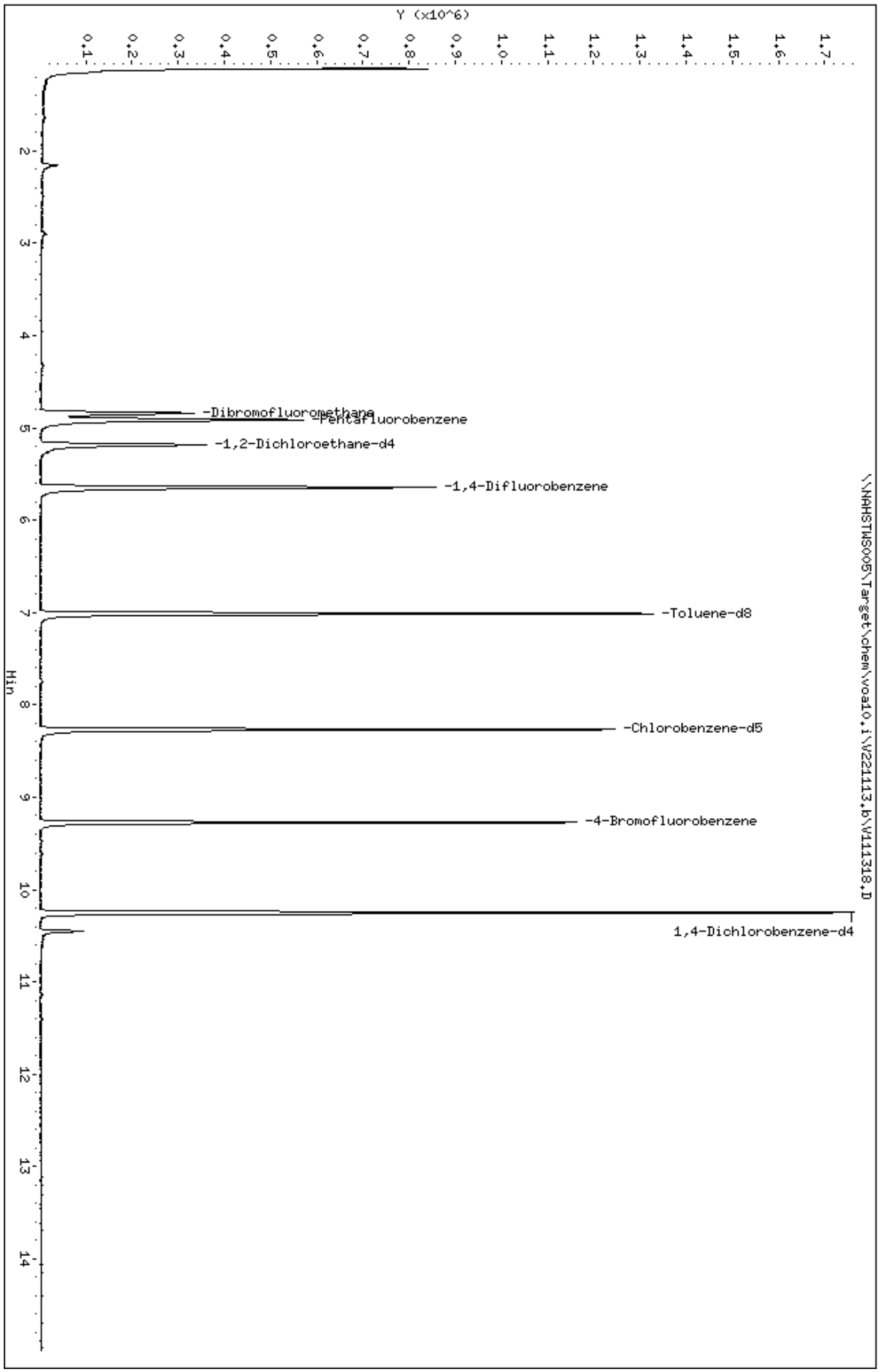
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	459932	50.0000	
$ 30 Dibromofluoromethane	113	4.837	4.845	(0.985)	231888	59.6732	59.67(M)
$ 35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.055)	282367	57.2173	57.21
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	715815	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	637256	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	822025	51.1757	51.17
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	312771	49.3415	49.34
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	418599	50.0000	

QC Flag Legend

M - Compound response manually integrated.

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111318.D
Date : 13-NOV-2022 17:02
Client ID: HS22110553-02
Sample Info: HS22110553-02;HS22110553-02;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18



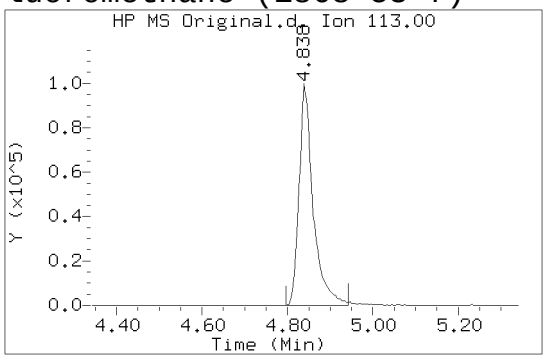
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111318.D
Inj Date : 13-NOV-2022 17:02
InstruID : voa10.i
LabSampID : HS22110553-02

Dibromofluoromethane (1868-53-7)

Reason Code:

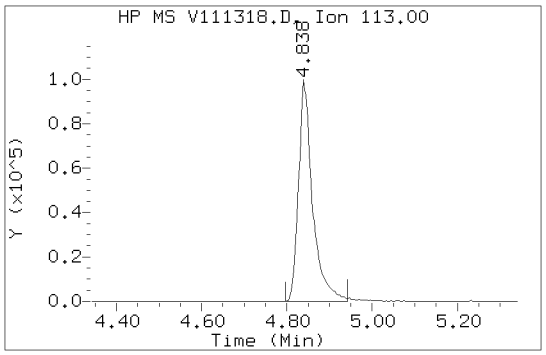
BEFORE

MASS
113
AREA
231888
HEIGHT
99872
17-Nov-2022
13:52
linh
pham



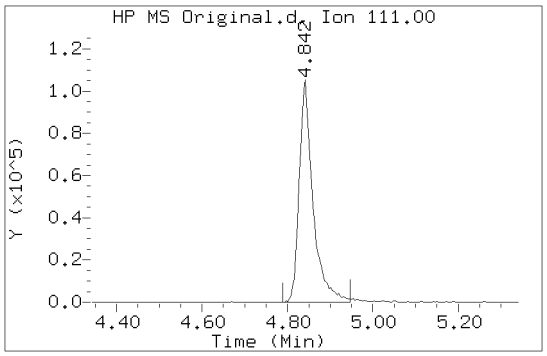
AFTER

MASS
113
AREA
231888
HEIGHT
99872
18-Nov-2022
12:49
linh
pham



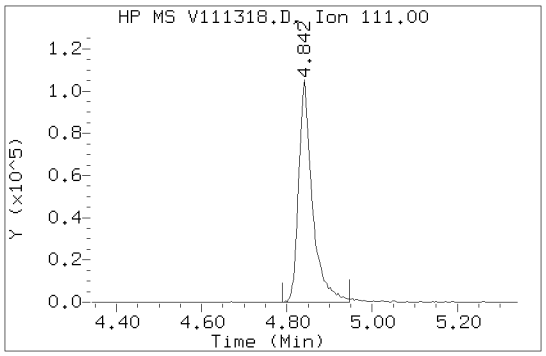
BEFORE

MASS
111
AREA
240155
HEIGHT
105304
17-Nov-2022
13:52
linh
pham



AFTER

MASS
111
AREA
240155
HEIGHT
105304
18-Nov-2022
12:49
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111319.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111319.D
Lab Smp Id: HS22110553-03 Client Smp ID: HS22110553-03
Inj Date : 13-NOV-2022 17:23
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-03;HS22110553-03;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 18
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

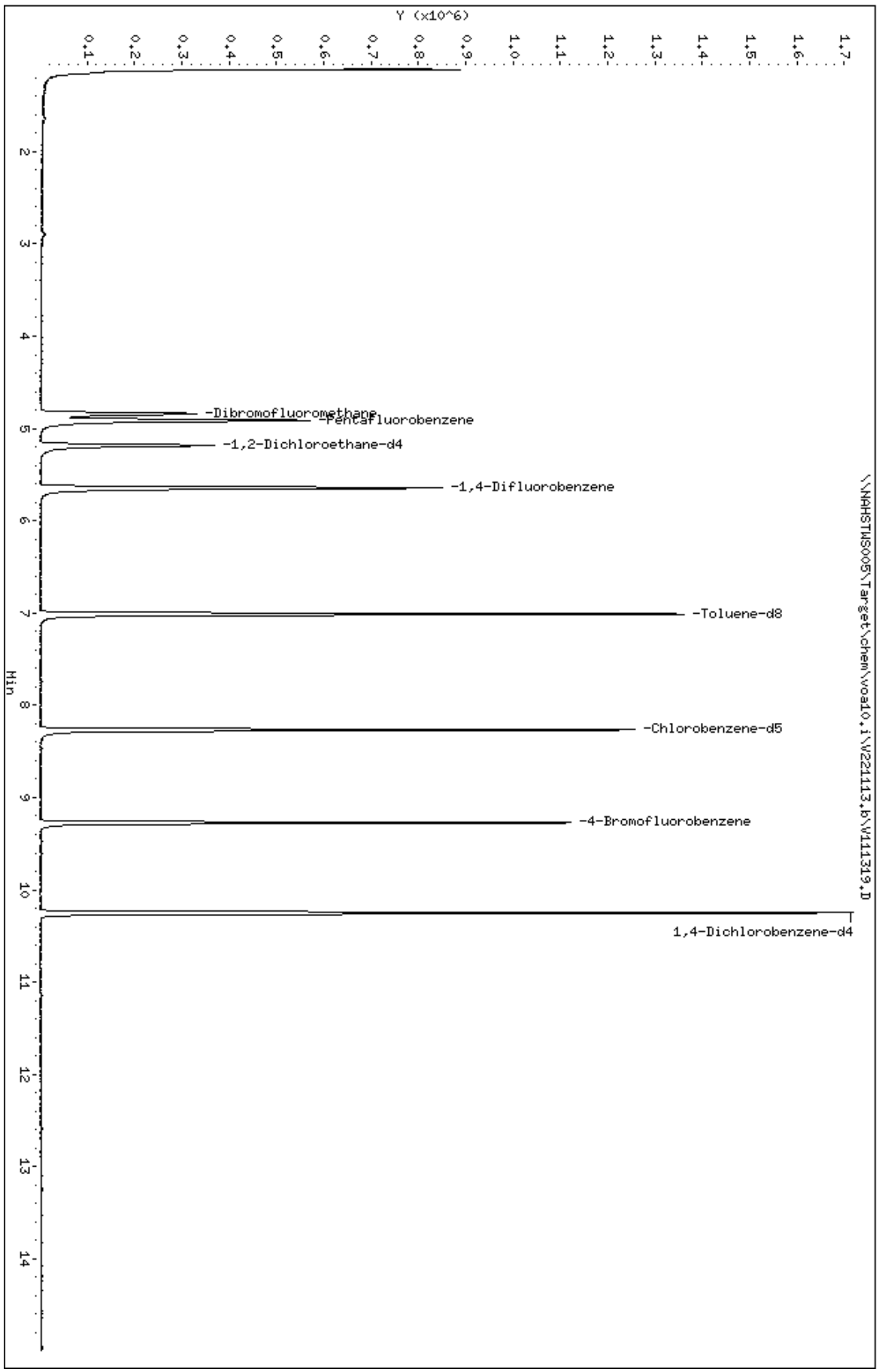
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	478672	50.0000	
$ 30 Dibromofluoromethane	113	4.837	4.845	(0.984)	235888	58.3260	58.32
$ 35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.054)	285912	55.6675	55.66
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	703529	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	636362	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	827562	51.5905	51.59
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	314056	49.6087	49.60
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	404827	50.0000	

Data File: \\NAHSTWS005\Target\chem\voa10,i\V221113,b\V111319,D
Date : 13-NOV-2022 17:23
Client ID: HS22110553-03
Sample Info: HS22110553-03;HS22110553-03;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10,i
Operator: PC
Column diameter: 0.18



Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111319.D
Inj Date : 13-NOV-2022 17:23
InstruID : voa10.i
LabSampID : HS22110553-03

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111320.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111320.D
Lab Smp Id: HS22110553-04 Client Smp ID: HS22110553-04
Inj Date : 13-NOV-2022 17:43
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-04;HS22110553-04;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 19
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

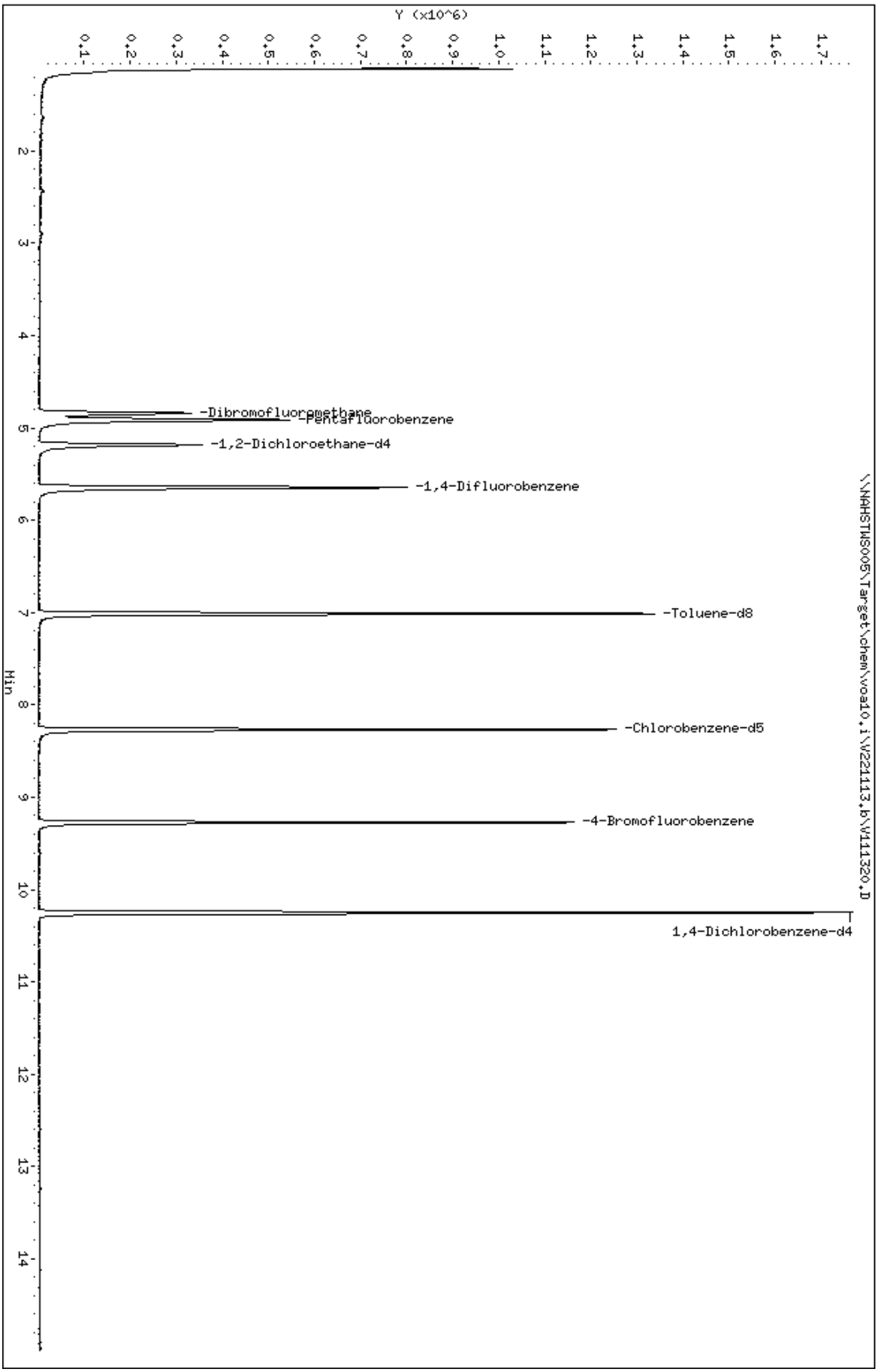
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	462925	50.0000	
$ 30 Dibromofluoromethane	113	4.837	4.845	(0.985)	232532	59.4520	59.45(M)
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	281780	56.7292	56.72
* 36 1,4-Difluorobenzene	114	5.647	5.643	(1.000)	688468	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	643334	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	821567	50.6668	50.66
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	319136	49.8599	49.85
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	412281	50.0000	

QC Flag Legend

M - Compound response manually integrated.

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111320.D
Date : 13-NOV-2022 17:43
Client ID: HS22110553-04
Sample Info: HS22110553-04;HS22110553-04;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18



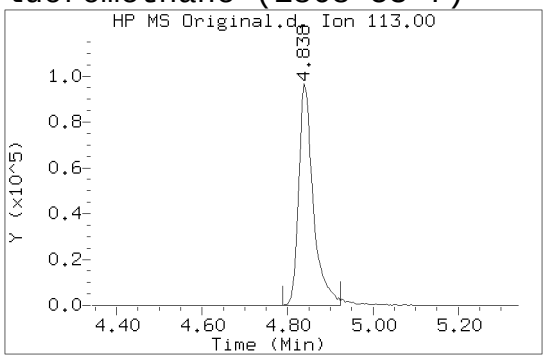
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111320.D
Inj Date : 13-NOV-2022 17:43
InstruID : voa10.i
LabSampID : HS22110553-04

Dibromofluoromethane (1868-53-7)

Reason Code:

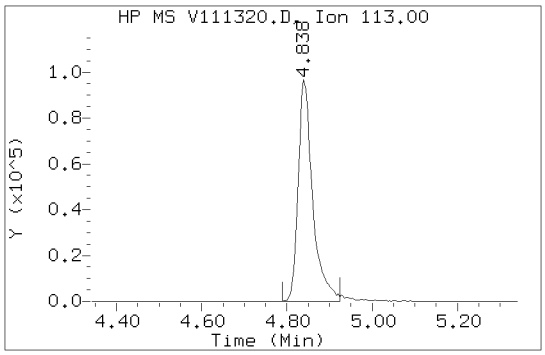
BEFORE

MASS
113
AREA
232532
HEIGHT
96760
17-Nov-2022
13:52
linh
pham



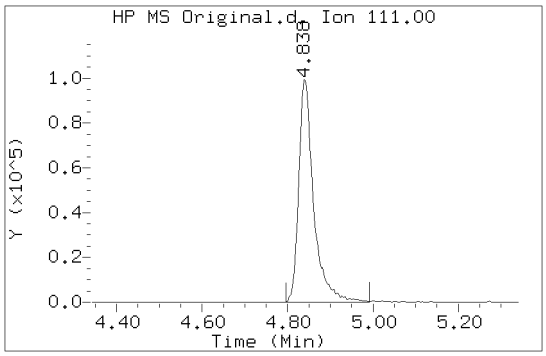
AFTER

MASS
113
AREA
232532
HEIGHT
96760
18-Nov-2022
12:49
linh
pham



BEFORE

MASS
111
AREA
245674
HEIGHT
99272
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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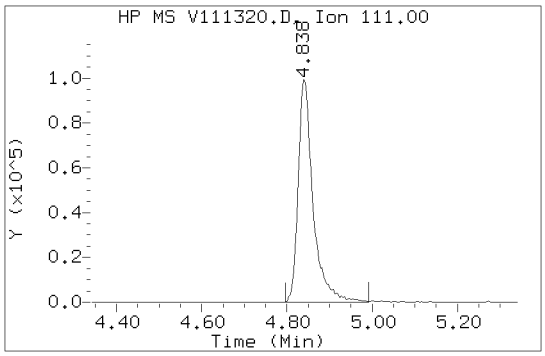
AREA
245674
HEIGHT
99272
18-Nov-2022
12:49
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111321.D Page 1
Report Date: 18-Nov-2022 12:50

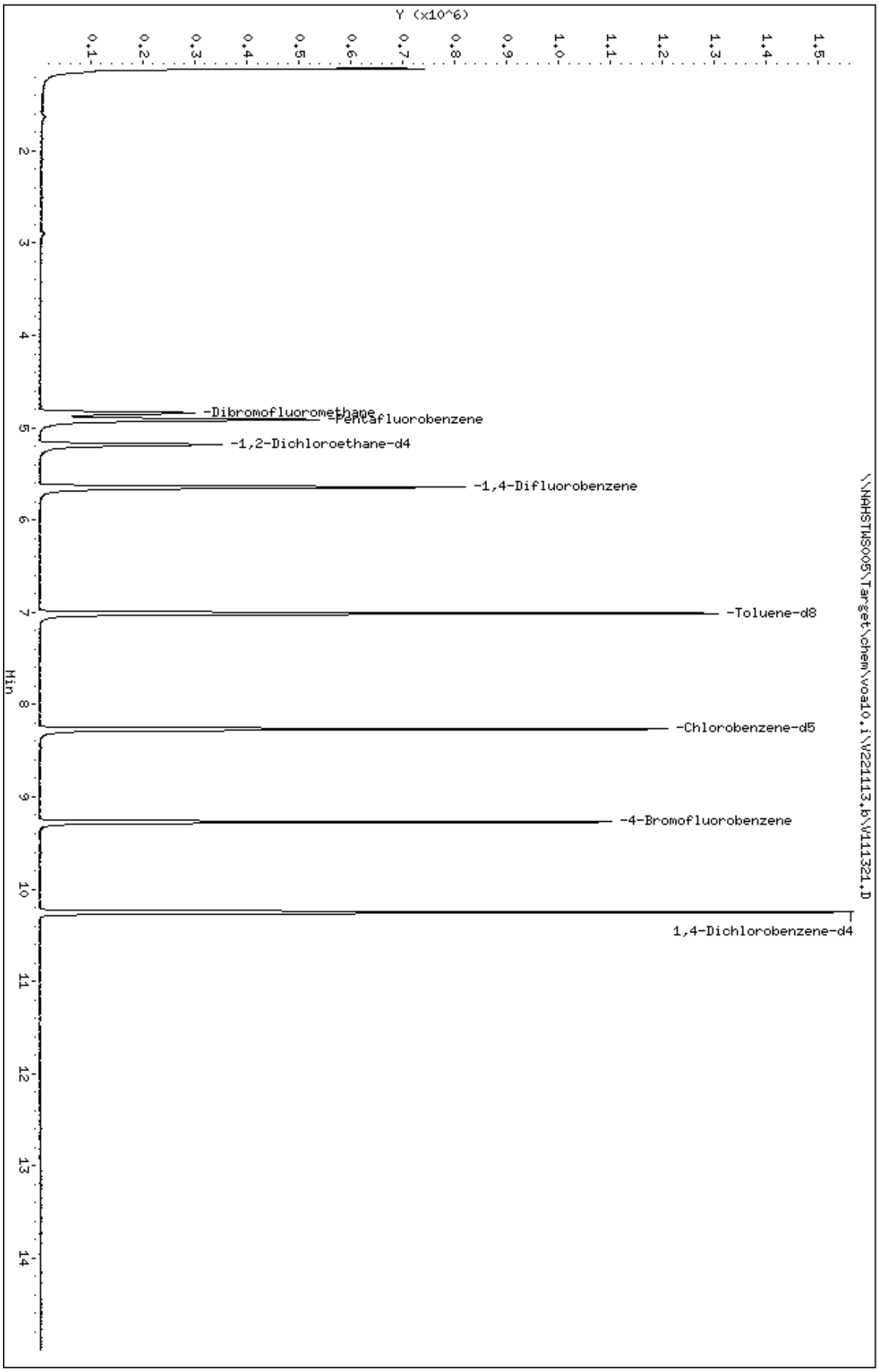
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111321.D
Lab Smp Id: HS22110553-07 Client Smp ID: HS22110553-07
Inj Date : 13-NOV-2022 18:04
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-07;HS22110553-07;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 20
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	441431	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.986)	210314	56.3897	56.38
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	273075	57.6536	57.65
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	675050	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	616796	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	789818	50.8037	50.80
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	299259	48.7868	48.78
* 70 1,4-Dichlorobenzene-d4	152	10.254	10.250	(1.000)	373251	50.0000	



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111321.D
Date : 13-NOV-2022 18:04
Client ID: HS22110553-07
Sample Info: HS22110553-07;HS22110553-07;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111321.D
Inj Date : 13-NOV-2022 18:04
InstruID : voa10.i
LabSampID : HS22110553-07

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111322.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111322.D
Lab Smp Id: HS22110553-08 Client Smp ID: HS22110553-08
Inj Date : 13-NOV-2022 18:24
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-08;HS22110553-08;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 21
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

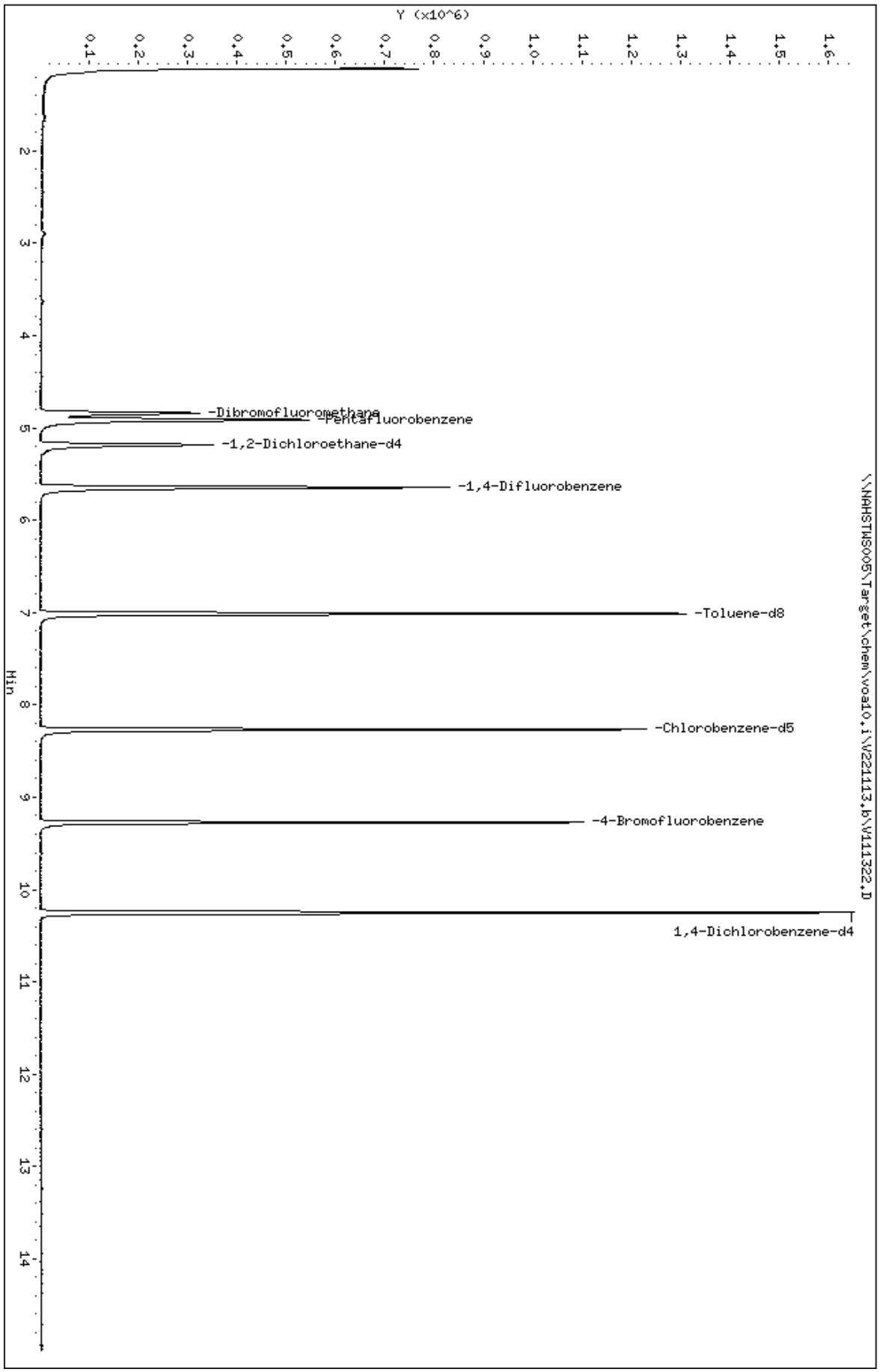
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	460226	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.985)	223786	57.5514	57.55
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	270027	54.6818	54.68
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	685050	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	605995	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	792299	51.8658	51.86
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	302130	50.1067	50.10
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	386593	50.0000	

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111322.D
Date : 13-NOV-2022 18:24
Client ID: HS22110553-08
Sample Info: HS22110553-08;HS22110553-08;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18



Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111322.D
Inj Date : 13-NOV-2022 18:24
InstruID : voa10.i
LabSampID : HS22110553-08

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111323.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111323.D
Lab Smp Id: HS22110553-09 Client Smp ID: HS22110553-09
Inj Date : 13-NOV-2022 18:45
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-09;HS22110553-09;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 22
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

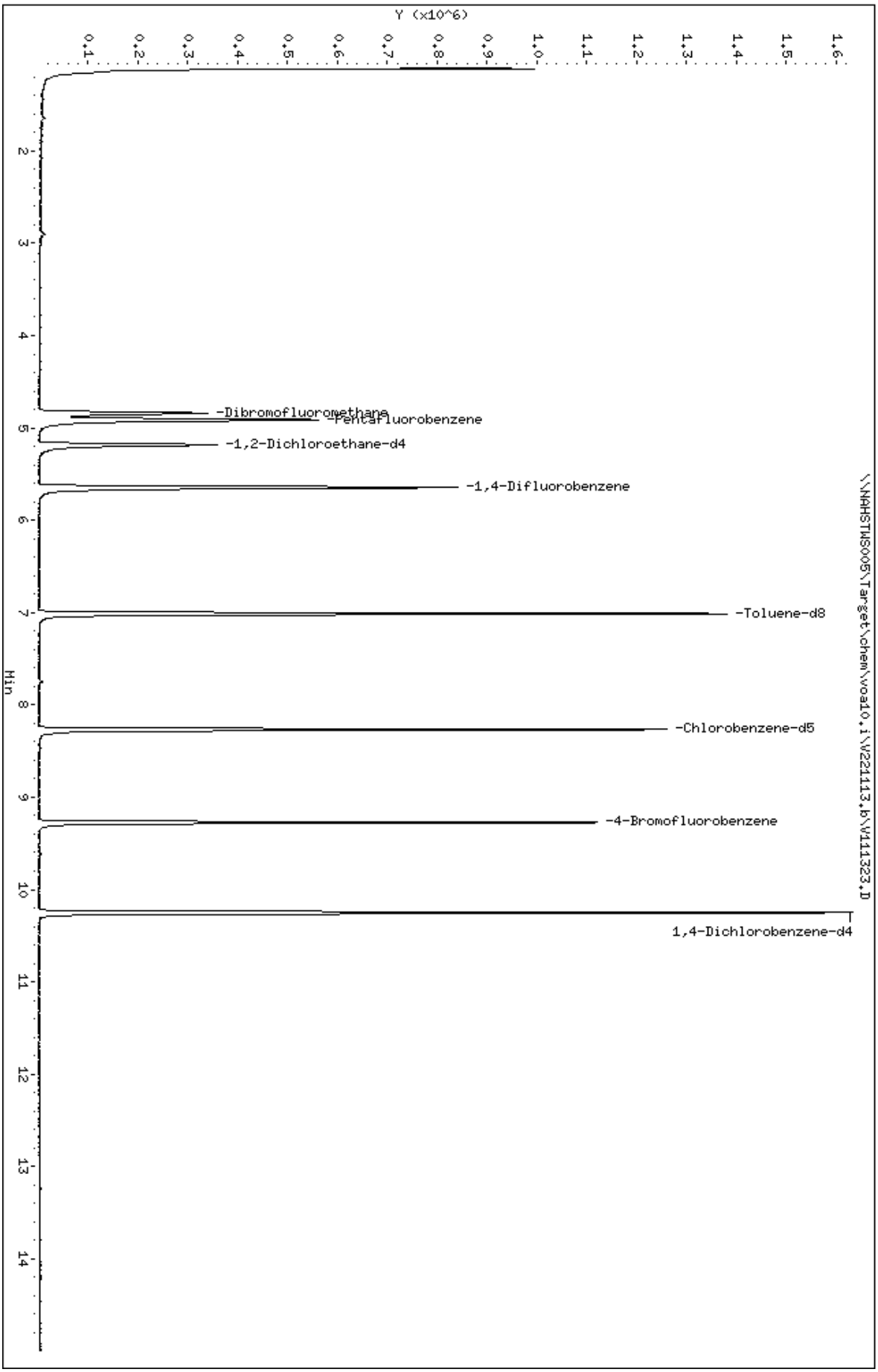
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	470829	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.986)	236646	59.4881	59.48(M)
$ 35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.055)	280380	55.4997	55.49
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	711616	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	625245	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	815017	51.7112	51.71
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	304914	49.0321	49.03
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	399819	50.0000	

QC Flag Legend

M - Compound response manually integrated.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Date : 13-NOV-2022 18:45
Client ID: HS22110553-09
Sample Info: HS22110553-09;HS22110553-09;;;
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10.i
Operator: PC
Column diameter: 0.18
Page 1
Y (x10^6)
Min
-Dibromofluoromethane
-Pentafluorobenzene
-1,2-Dichloroethane-d4
-1,4-Difluorobenzene
-Toluene-d8
-Chlorobenzene-d5
-4-Bromofluorobenzene
1,4-Dichlorobenzene-d4
\\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111323.D

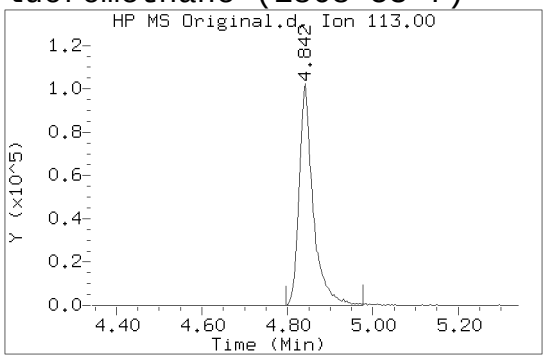
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111323.D
Inj Date : 13-NOV-2022 18:45
InstruID : voa10.i
LabSampID : HS22110553-09

Dibromofluoromethane (1868-53-7)

Reason Code:

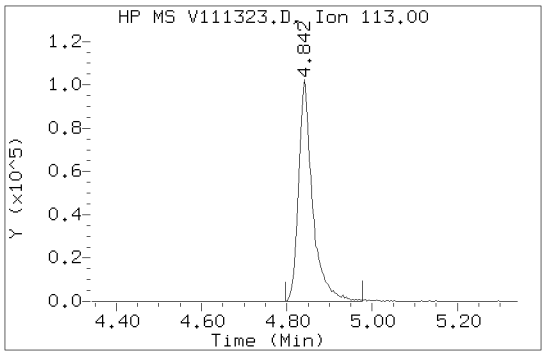
BEFORE

MASS
113
AREA
236646
HEIGHT
102400
17-Nov-2022
13:52
linh
pham



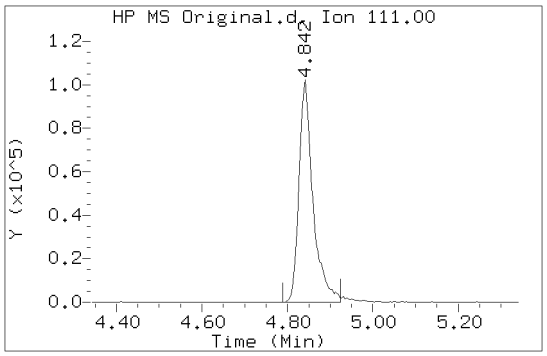
AFTER

MASS
113
AREA
236646
HEIGHT
102400
18-Nov-2022
12:49
linh
pham



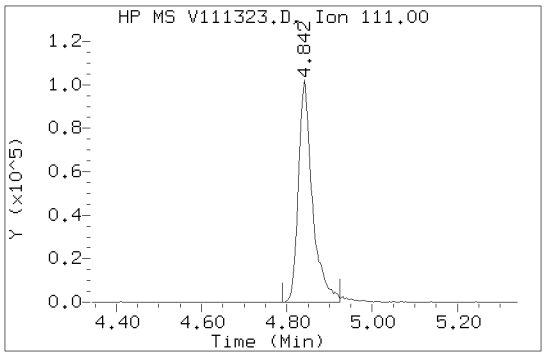
BEFORE

MASS
111
AREA
236806
HEIGHT
102232
17-Nov-2022
13:52
linh
pham



AFTER

MASS
111
AREA
236806
HEIGHT
102232
18-Nov-2022
12:49
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111324.D Page 1
Report Date: 18-Nov-2022 12:50

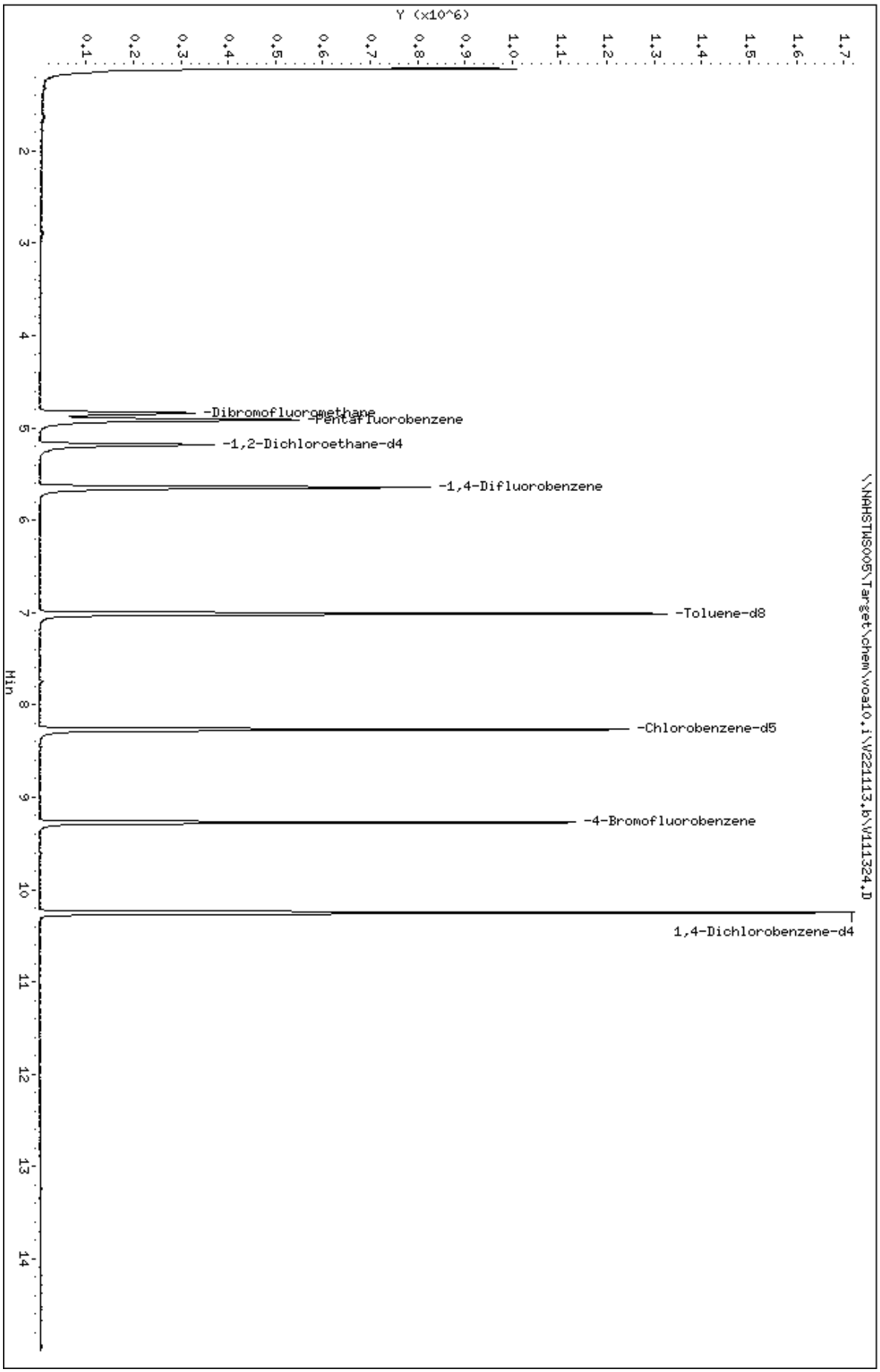
ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111324.D
Lab Smp Id: HS22110553-10 Client Smp ID: HS22110553-10
Inj Date : 13-NOV-2022 19:05
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-10;HS22110553-10;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 23
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	458787	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.985)	237122	61.1724	61.17
$ 35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.054)	277226	56.3158	56.31
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	691917	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	615161	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	807375	52.0642	52.06
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	306750	50.1148	50.11
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	402691	50.0000	



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111324.D
Date : 13-NOV-2022 19:05
Client ID: HS22110553-10
Sample Info: HS22110553-10;HS22110553-10;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111324.D
Inj Date : 13-NOV-2022 19:05
InstruID : voa10.i
LabSampID : HS22110553-10

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111325.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111325.D
Lab Smp Id: HS22110553-11 Client Smp ID: HS22110553-11
Inj Date : 13-NOV-2022 19:26
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-11;HS22110553-11;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 24
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

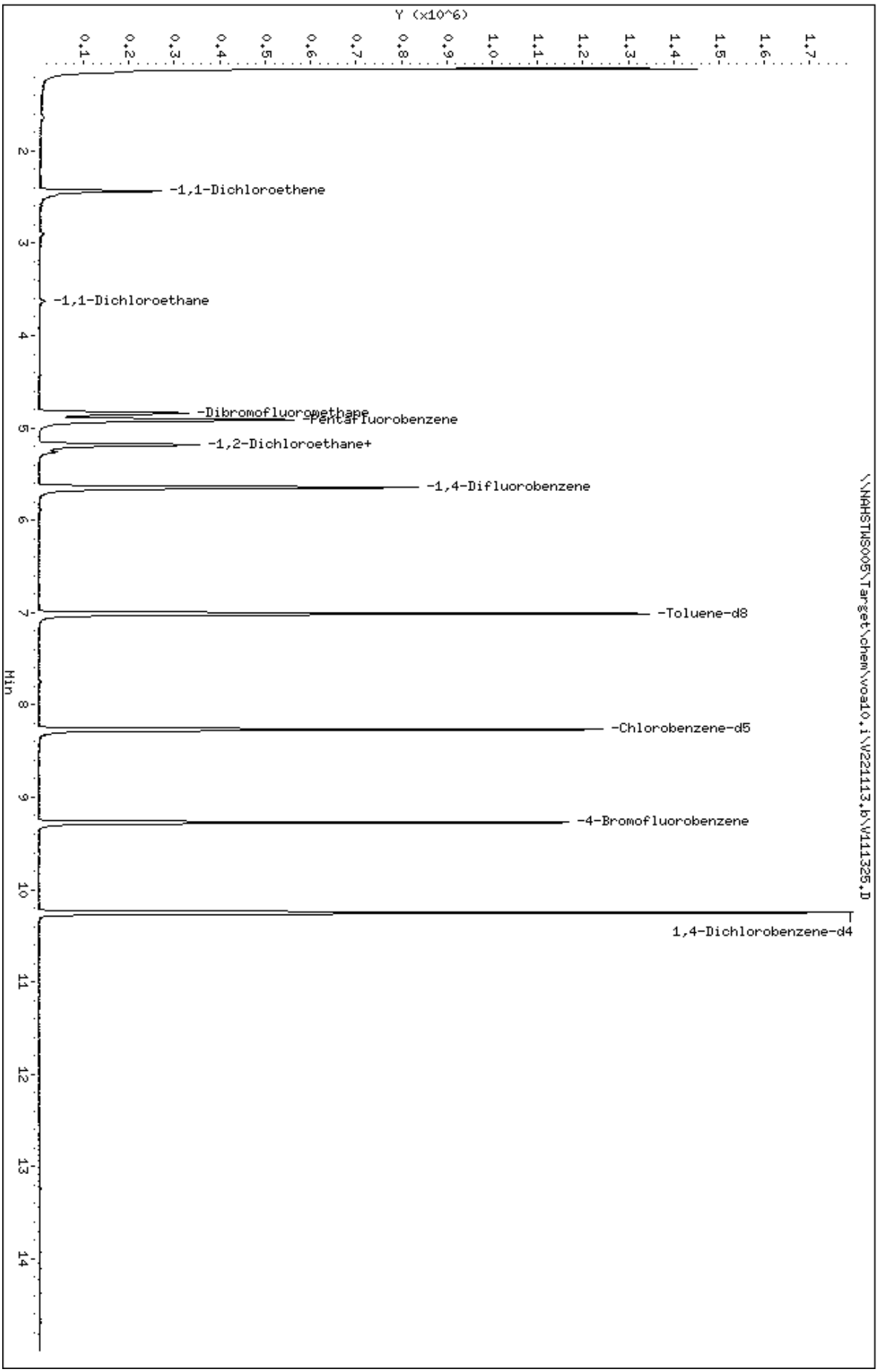
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
*	1 Pentafluorobenzene	168	4.916	4.916	(1.000)	468865	50.0000	
	11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	101315	36.3643	36.36
	22 1,1-Dichloroethane	63	3.634	3.630	(0.739)	11574	1.27045	1.27(a)
$	30 Dibromofluoromethane	113	4.841	4.845	(0.985)	235602	59.4738	59.47(M)
	33 1,2-Dichloroethane	62	5.261	5.265	(0.932)	23500	3.58283	3.58(a)
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	283165	56.2858	56.28
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	709778	50.0000	
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	633593	50.0000	
$	48 Toluene-d8	98	7.011	7.012	(0.848)	817974	51.2177	51.21
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	312437	49.5694	49.56
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	423848	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



Data File: \\NAHSTMS005\Target\chem\voa10.i\V221113.b\V111325.D
Date : 13-NOV-2022 19:26
Client ID: HS22110553-11
Sample Info: HS22110553-11;HS22110553-11;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111325.D

Date : 13-NOV-2022 19:26

Client ID: HS22110553-11

Instrument: voa10.i

Sample Info: HS22110553-11;HS22110553-11;;;

Purge Volume: 5.0

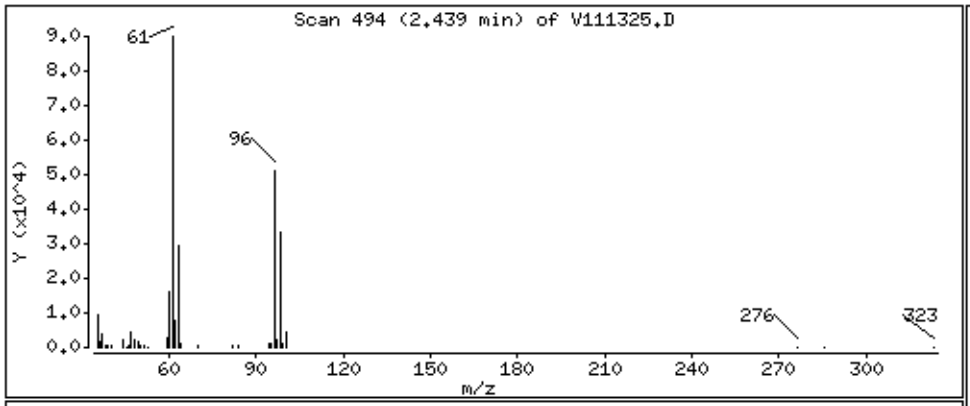
Operator: PC

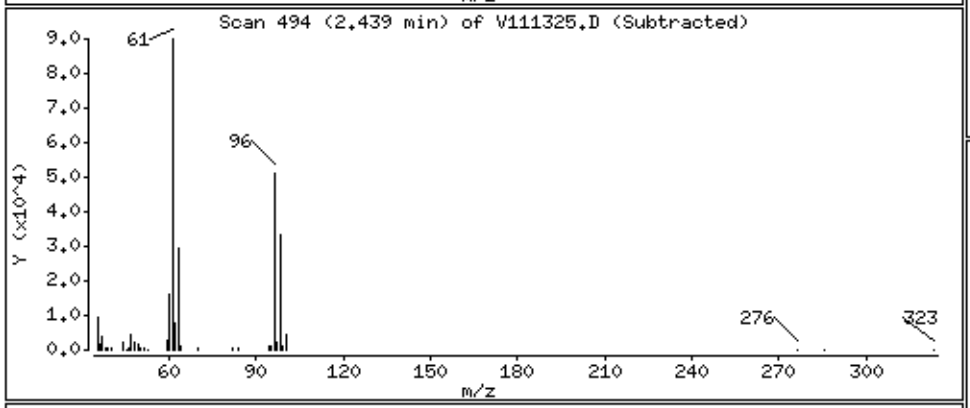
Column phase: DB624

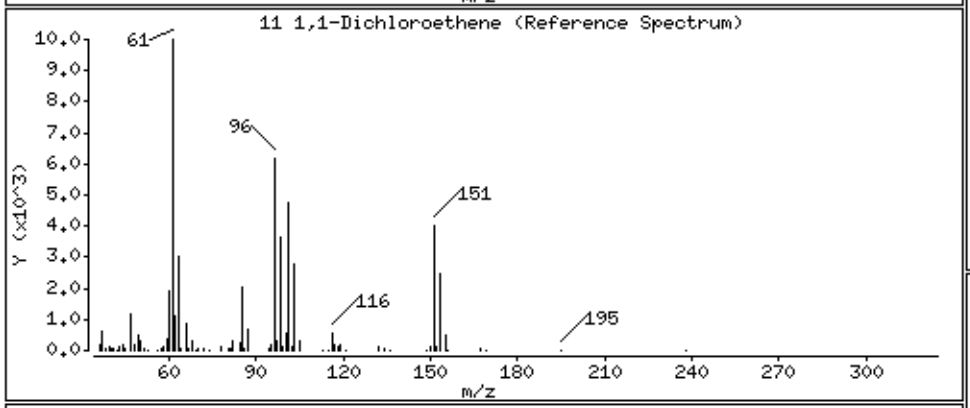
Column diameter: 0.18

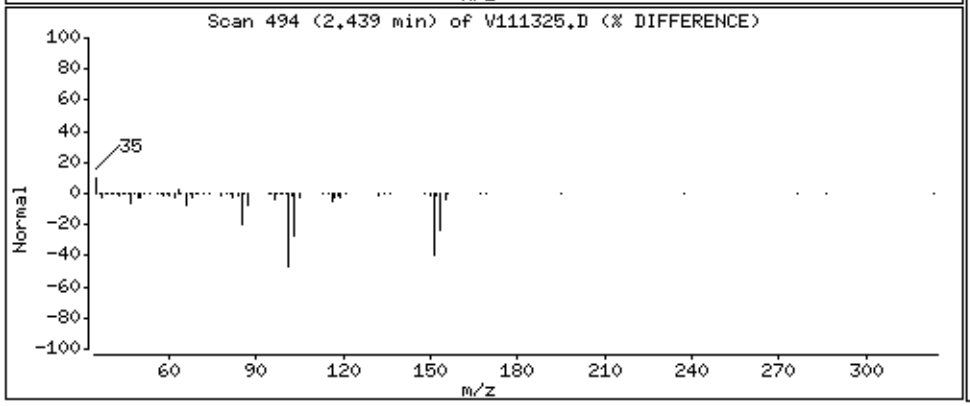
11 1,1-Dichloroethene

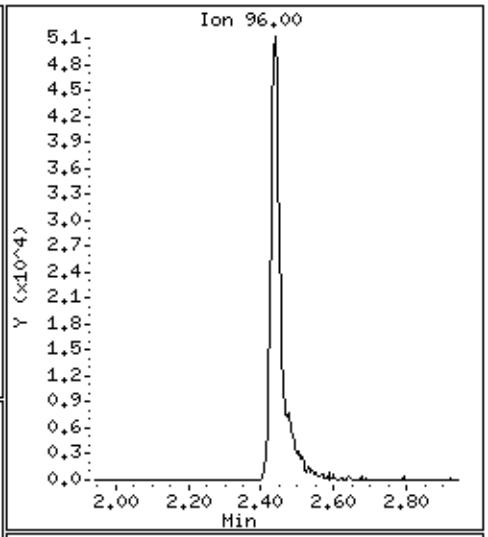
Concentration: 36.36 ug/l

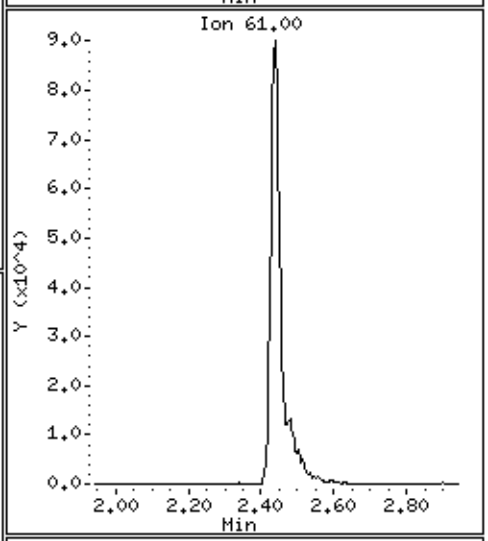


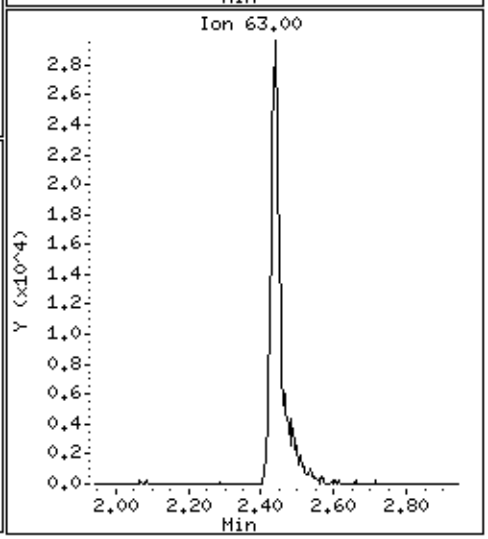












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111325.D Page 3

Date : 13-NOV-2022 19:26

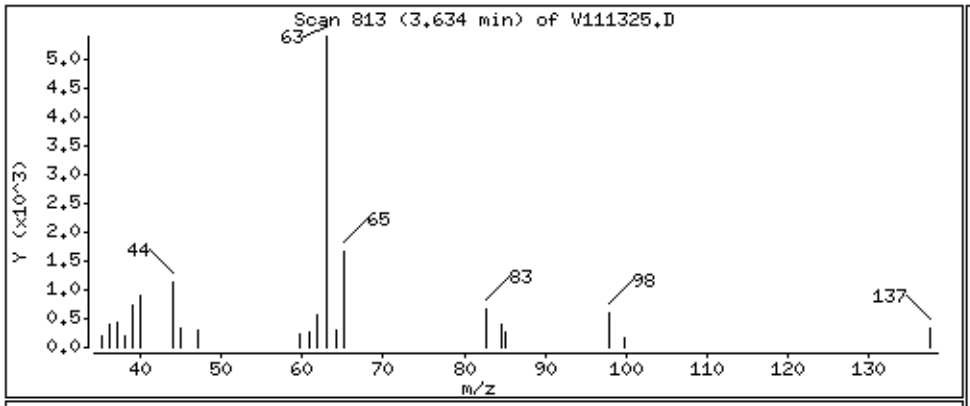
Client ID: HS22110553-11 Instrument: voa10.i

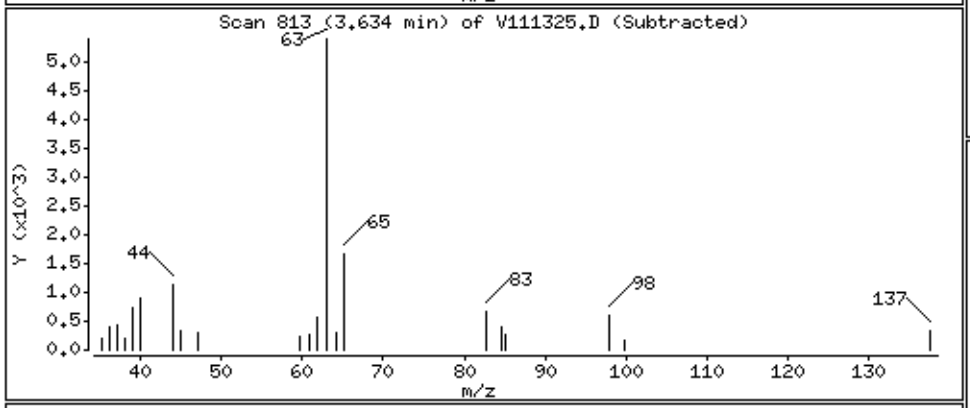
Sample Info: HS22110553-11;HS22110553-11;;;

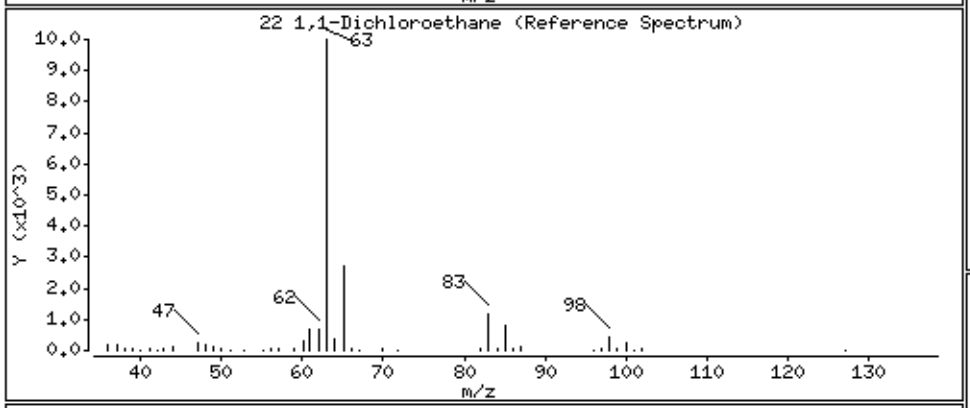
Purge Volume: 5.0 Operator: PC

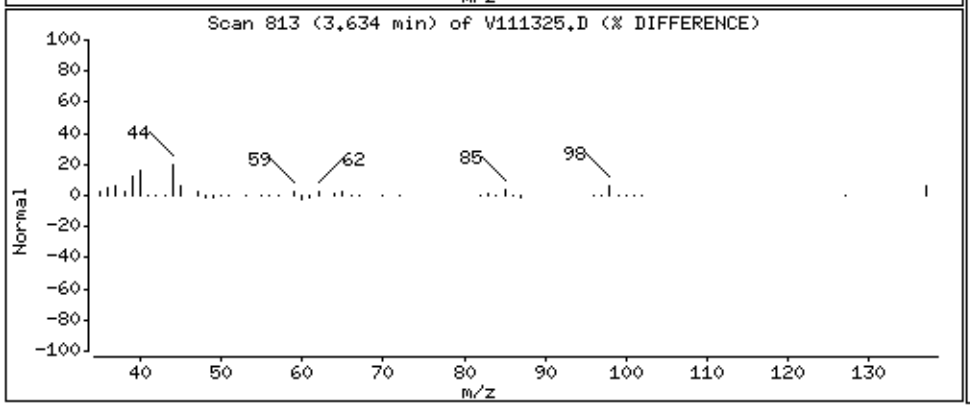
Column phase: DB624 Column diameter: 0.18

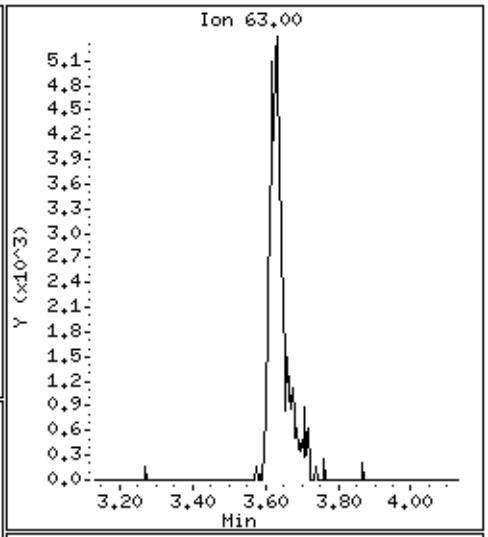
22 1,1-Dichloroethane Concentration: 1.27 ug/l

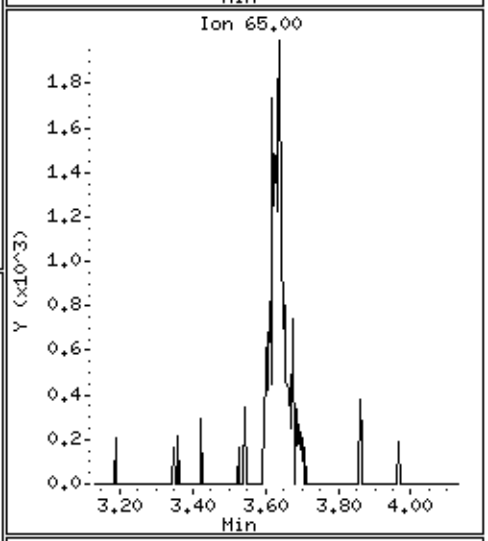


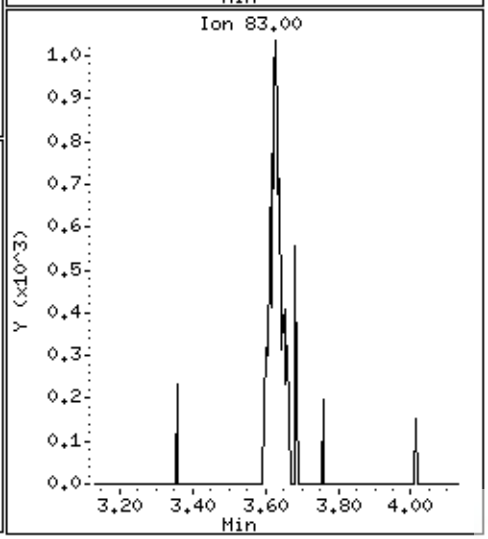












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111325.D Page 4

Date : 13-NOV-2022 19:26

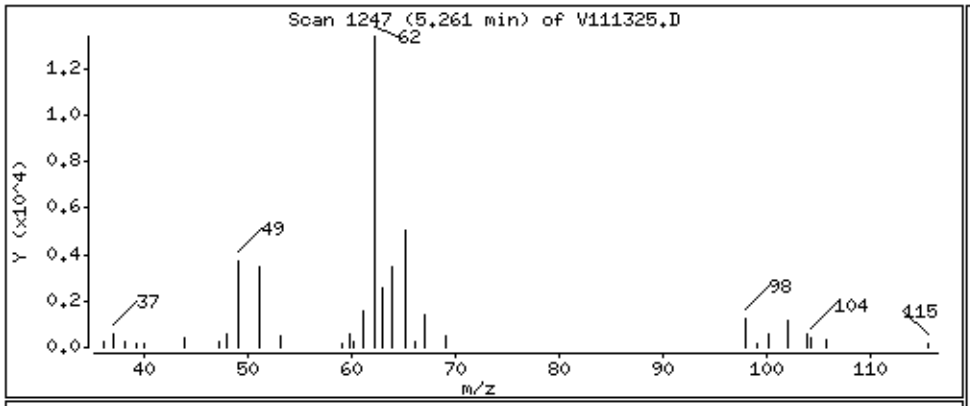
Client ID: HS22110553-11 Instrument: voa10.i

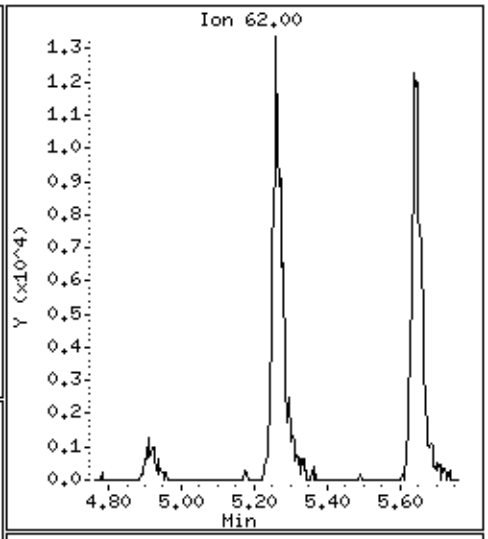
Sample Info: HS22110553-11;HS22110553-11;;;

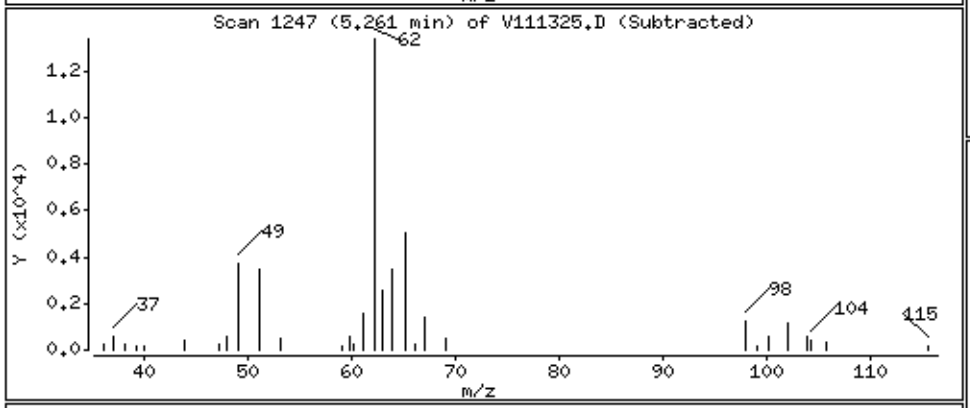
Purge Volume: 5.0 Operator: PC

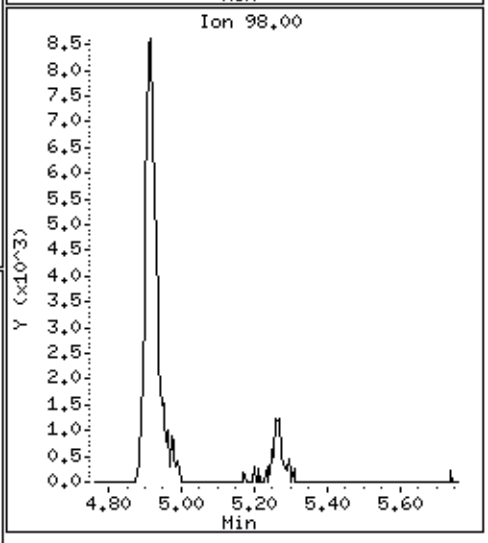
Column phase: DB624 Column diameter: 0.18

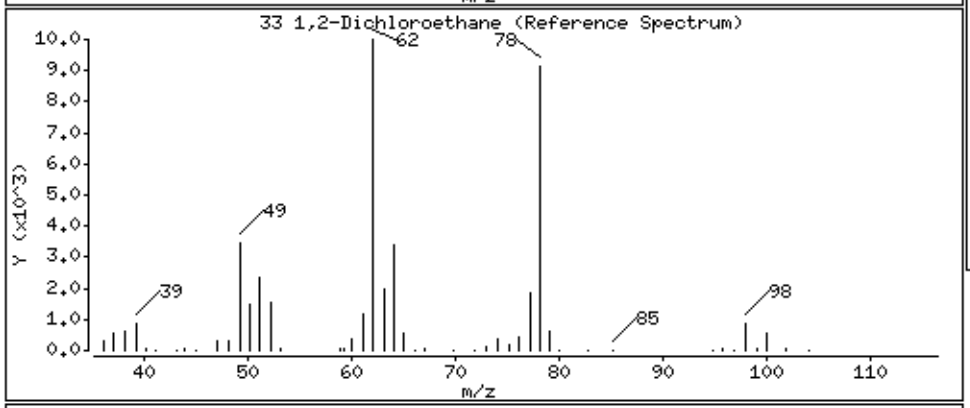
33 1,2-Dichloroethane Concentration: 3.58 ug/l

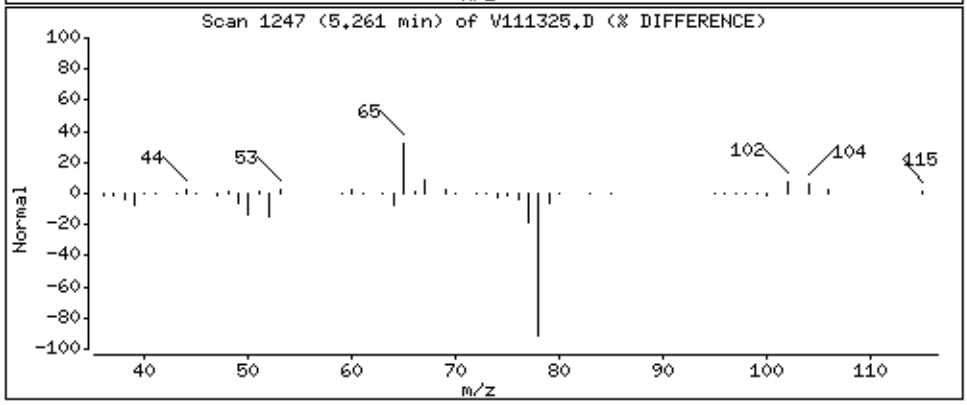












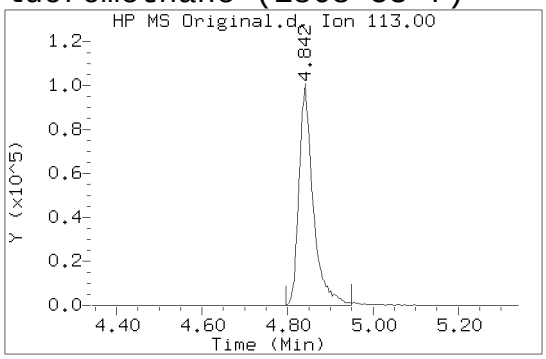
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111325.D
Inj Date : 13-NOV-2022 19:26
InstruID : voa10.i
LabSampID : HS22110553-11

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

MASS
113
AREA
235602
HEIGHT
100840
17-Nov-2022
13:52
linh
pham



AFTER

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HEIGHT
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18-Nov-2022
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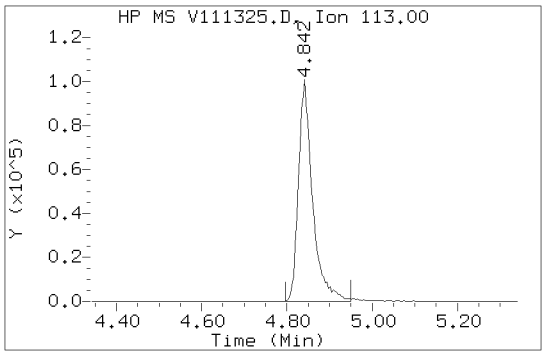

BEFORE

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HEIGHT
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17-Nov-2022
13:52
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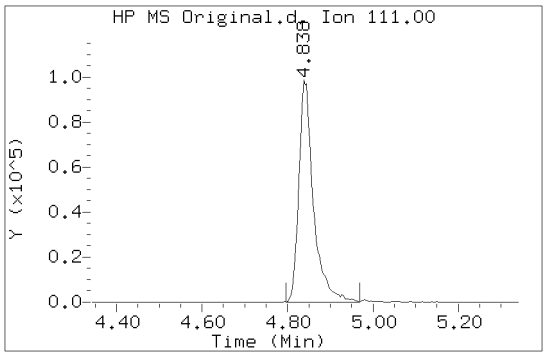

AFTER

MASS
111
AREA
238218
HEIGHT
98712
18-Nov-2022
12:49
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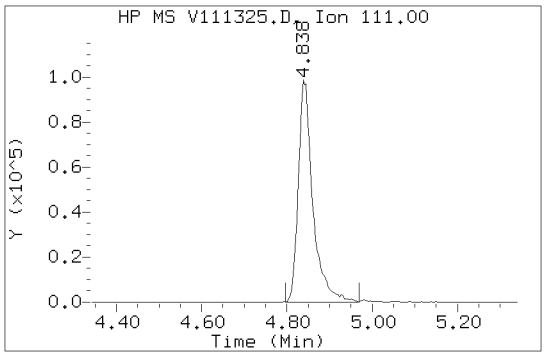
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111326.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111326.D
Lab Smp Id: HS22110553-13 Client Smp ID: HS22110553-13
Inj Date : 13-NOV-2022 19:46
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-13;HS22110553-13;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 25
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

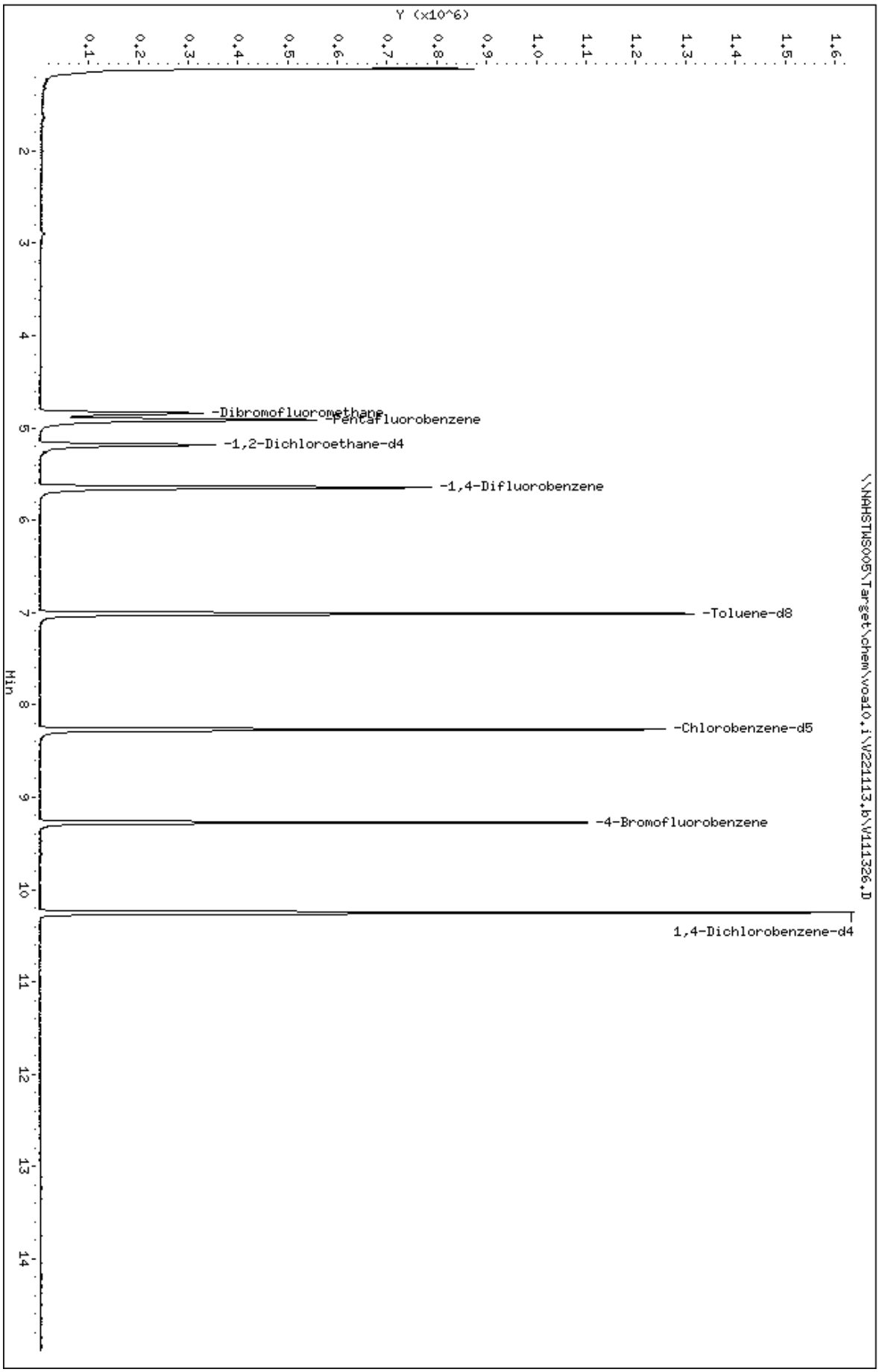
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	462950	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.985)	232520	59.4457	59.44
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	279053	56.1771	56.17
* 36 1,4-Difluorobenzene	114	5.647	5.643	(1.000)	682124	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	621676	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	807672	51.5403	51.54
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	301389	48.7491	48.74
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	389207	50.0000	

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111326.D
Date : 13-NOV-2022 19:46
Client ID: HS22110553-13
Sample Info: HS22110553-13;HS22110553-13;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18



Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111326.D
Inj Date : 13-NOV-2022 19:46
InstruID : voa10.i
LabSampID : HS22110553-13

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111327.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111327.D
Lab Smp Id: HS22110553-05 Client Smp ID: HS22110553-05
Inj Date : 13-NOV-2022 20:07
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-05;HS22110553-05;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 26
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

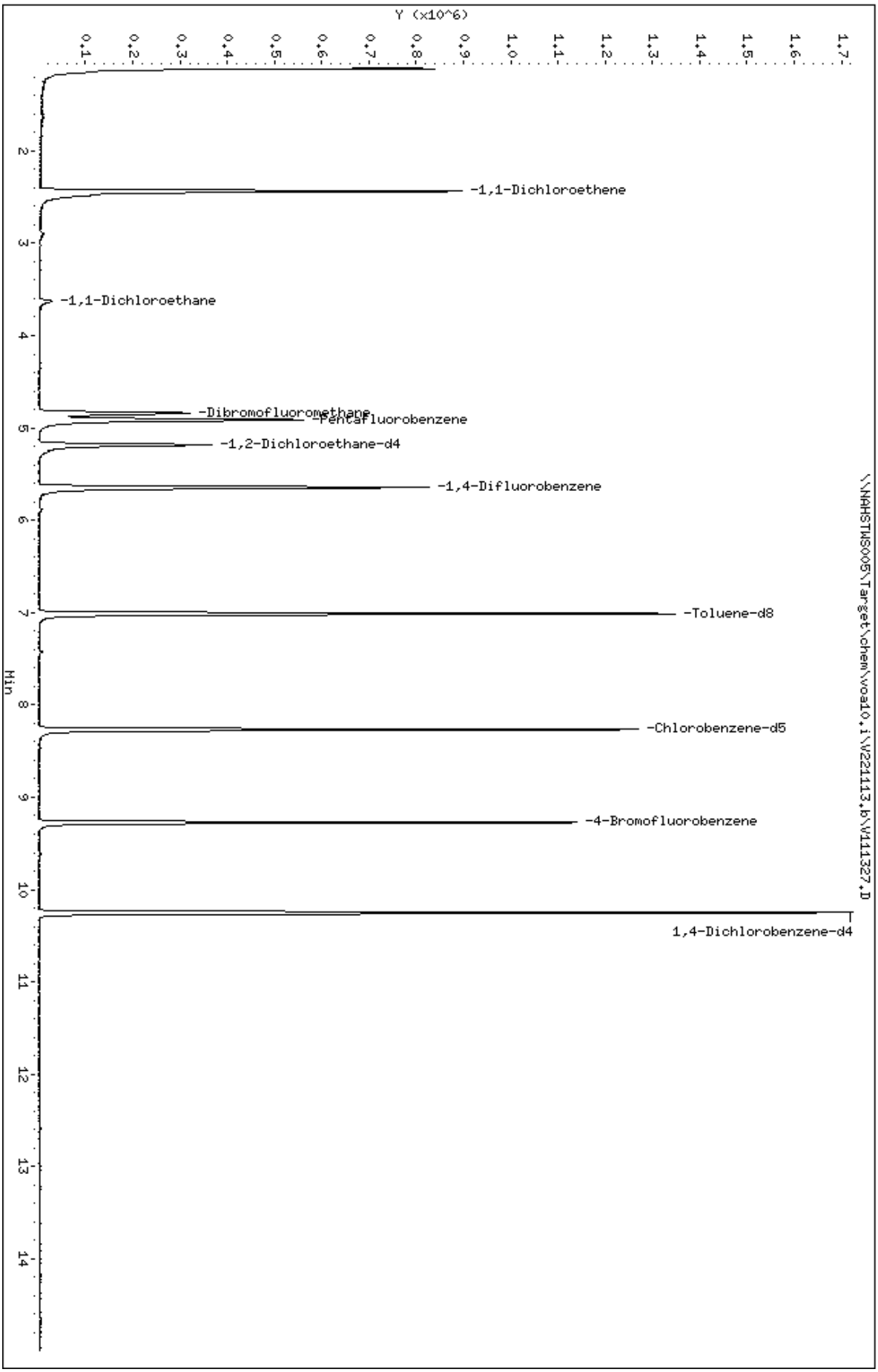
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	471637	50.0000	
11 1,1-Dichloroethene	96	2.438	2.438	(0.496)	349069	100.035	100.03
22 1,1-Dichloroethane	63	3.634	3.630	(0.739)	31644	4.47468	4.47(a)
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.985)	227351	57.0537	57.05
$ 35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.054)	282433	55.8103	55.81
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	707166	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	627202	50.0000	
$ 48 Toluene-d8	98	7.011	7.012	(0.848)	816652	51.6536	51.65
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	309114	49.5424	49.54
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	405860	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTMS005\Target\chem\voa10.i\V221113.b\V111327.D
Date : 13-NOV-2022 20:07
Client ID: HS22110553-05
Sample Info: HS22110553-05;HS22110553-05;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111327.D Page 2

Date : 13-NOV-2022 20:07

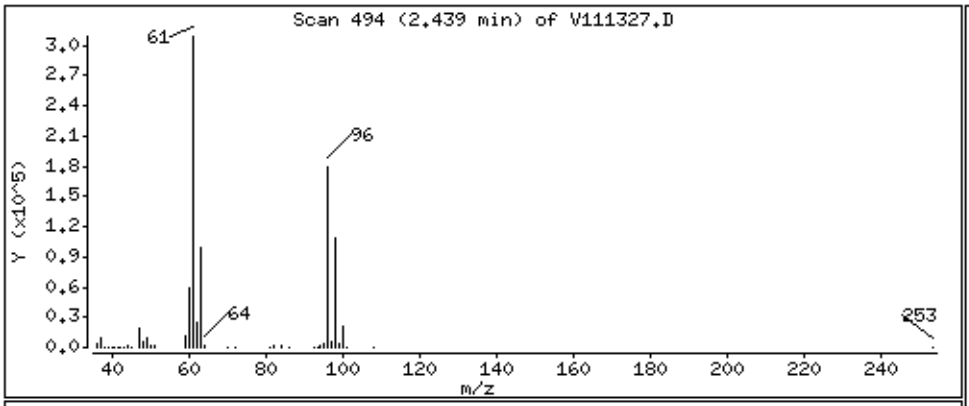
Client ID: HS22110553-05 Instrument: voa10.i

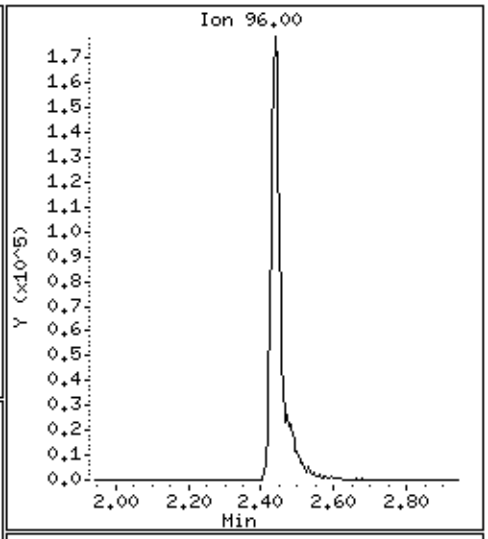
Sample Info: HS22110553-05;HS22110553-05;;;

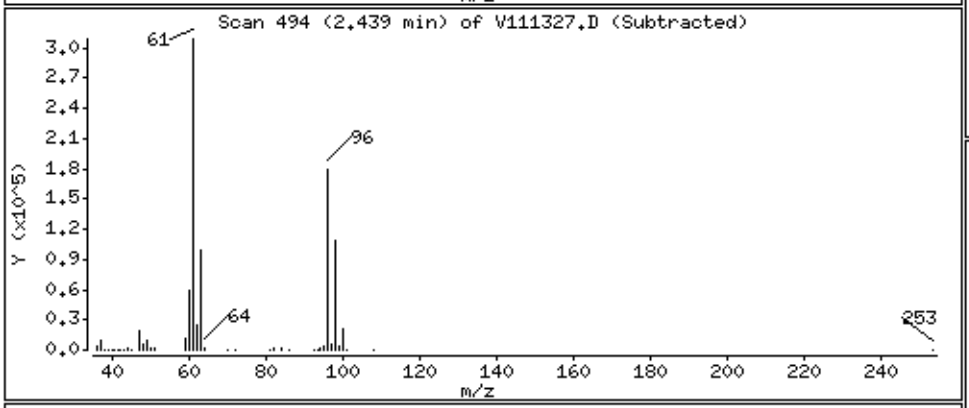
Purge Volume: 5.0 Operator: PC

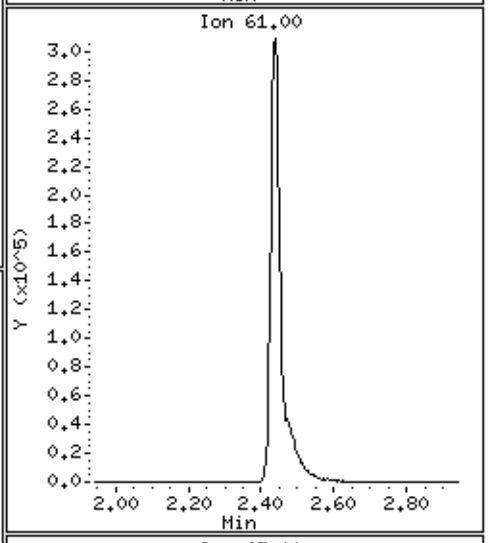
Column phase: DB624 Column diameter: 0.18

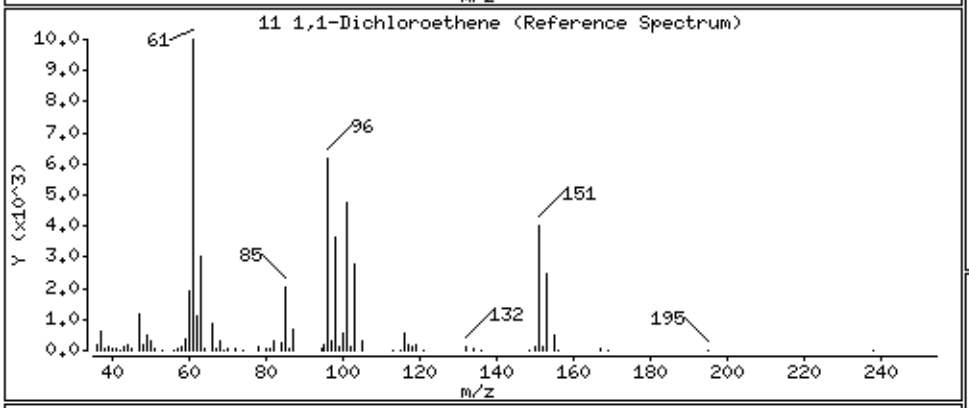
11 1,1-Dichloroethene Concentration: 100.03 ug/l

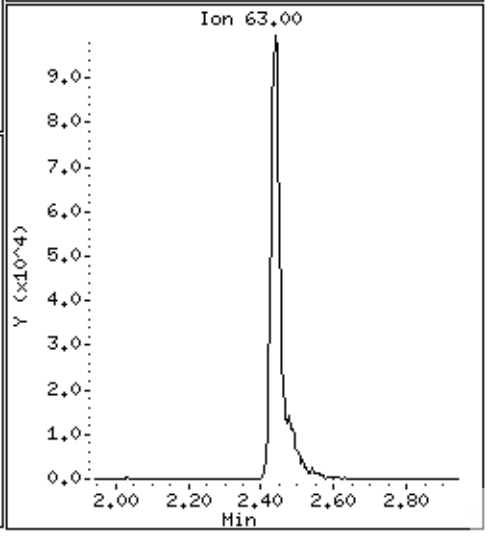


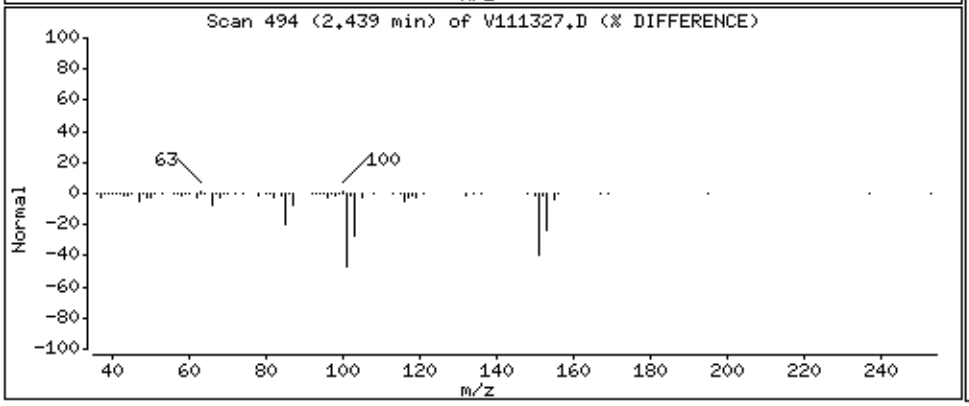












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111327.D Page 3

Date : 13-NOV-2022 20:07

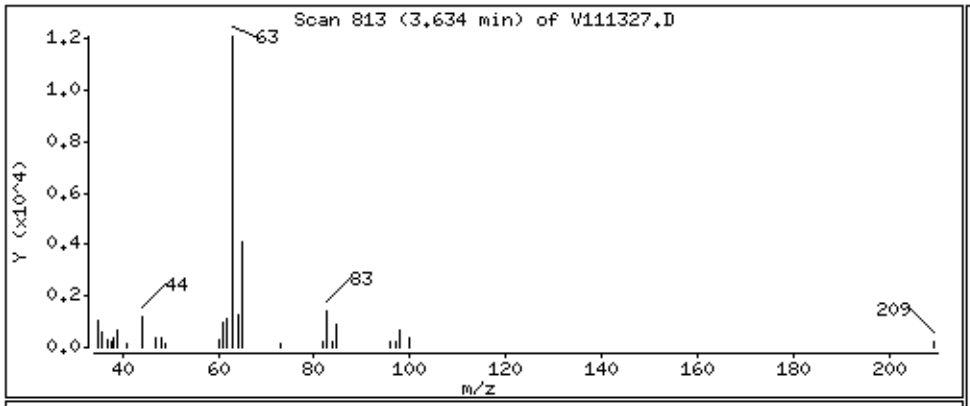
Client ID: HS22110553-05 Instrument: voa10.i

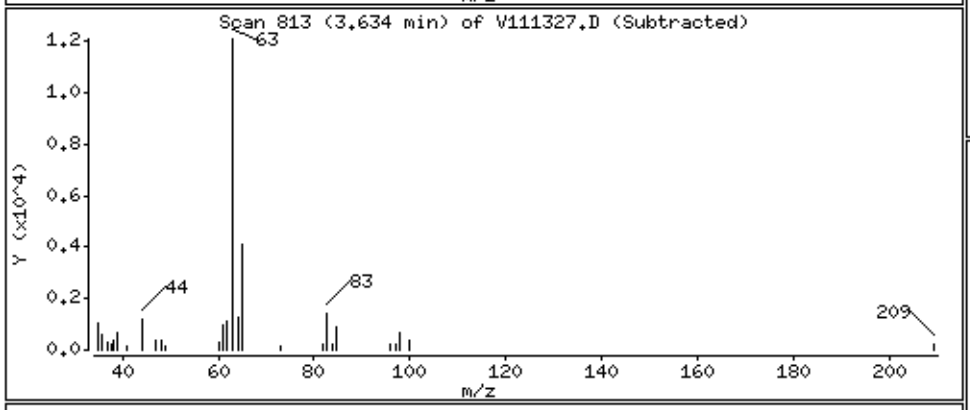
Sample Info: HS22110553-05;HS22110553-05;;;

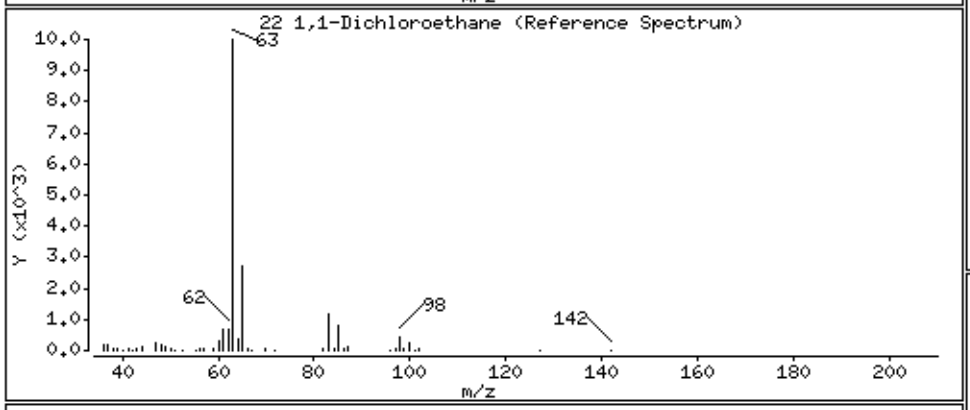
Purge Volume: 5.0 Operator: PC

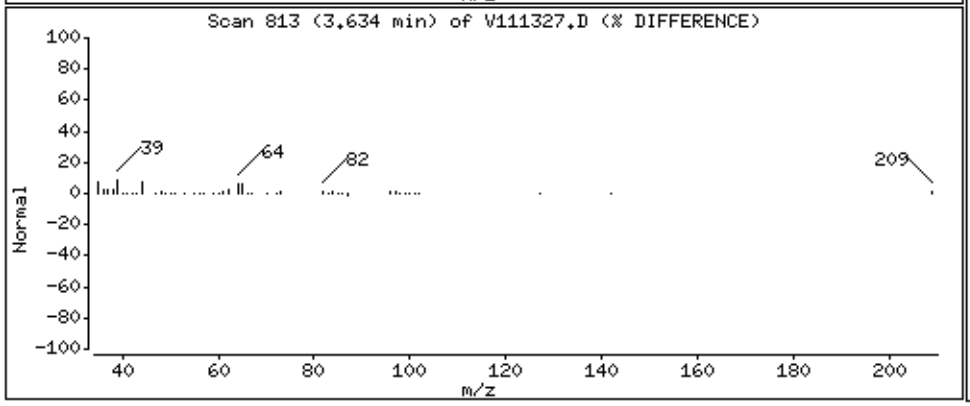
Column phase: DB624 Column diameter: 0.18

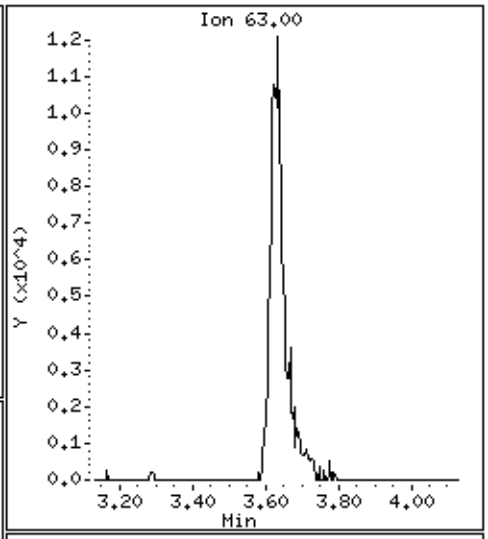
22 1,1-Dichloroethane Concentration: 4.47 ug/l

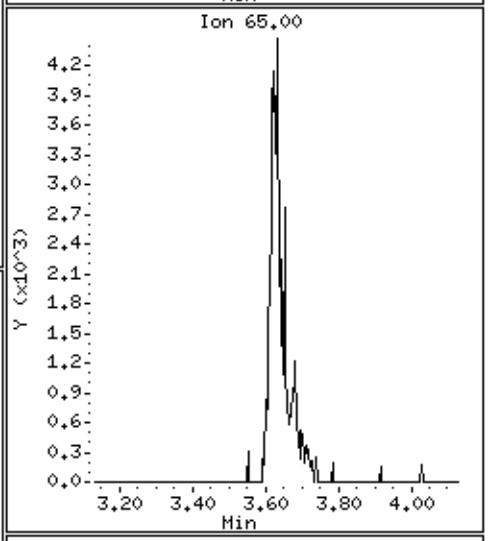


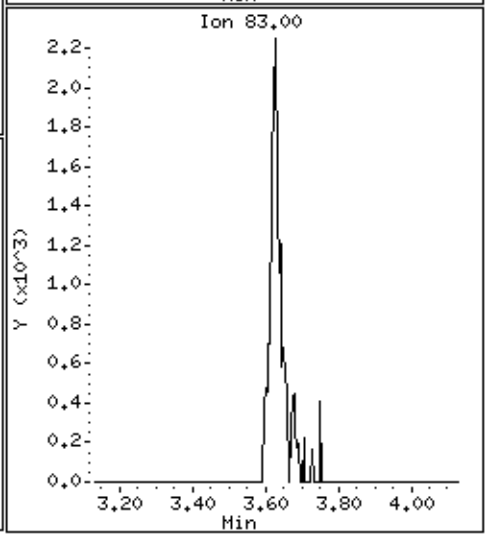












Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111327.D
Inj Date : 13-NOV-2022 20:07
InstruID : voa10.i
LabSampID : HS22110553-05

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111328.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111328.D
Lab Smp Id: HS22110553-12 Client Smp ID: HS22110553-12
Inj Date : 13-NOV-2022 20:27
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-12;HS22110553-12;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 27
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

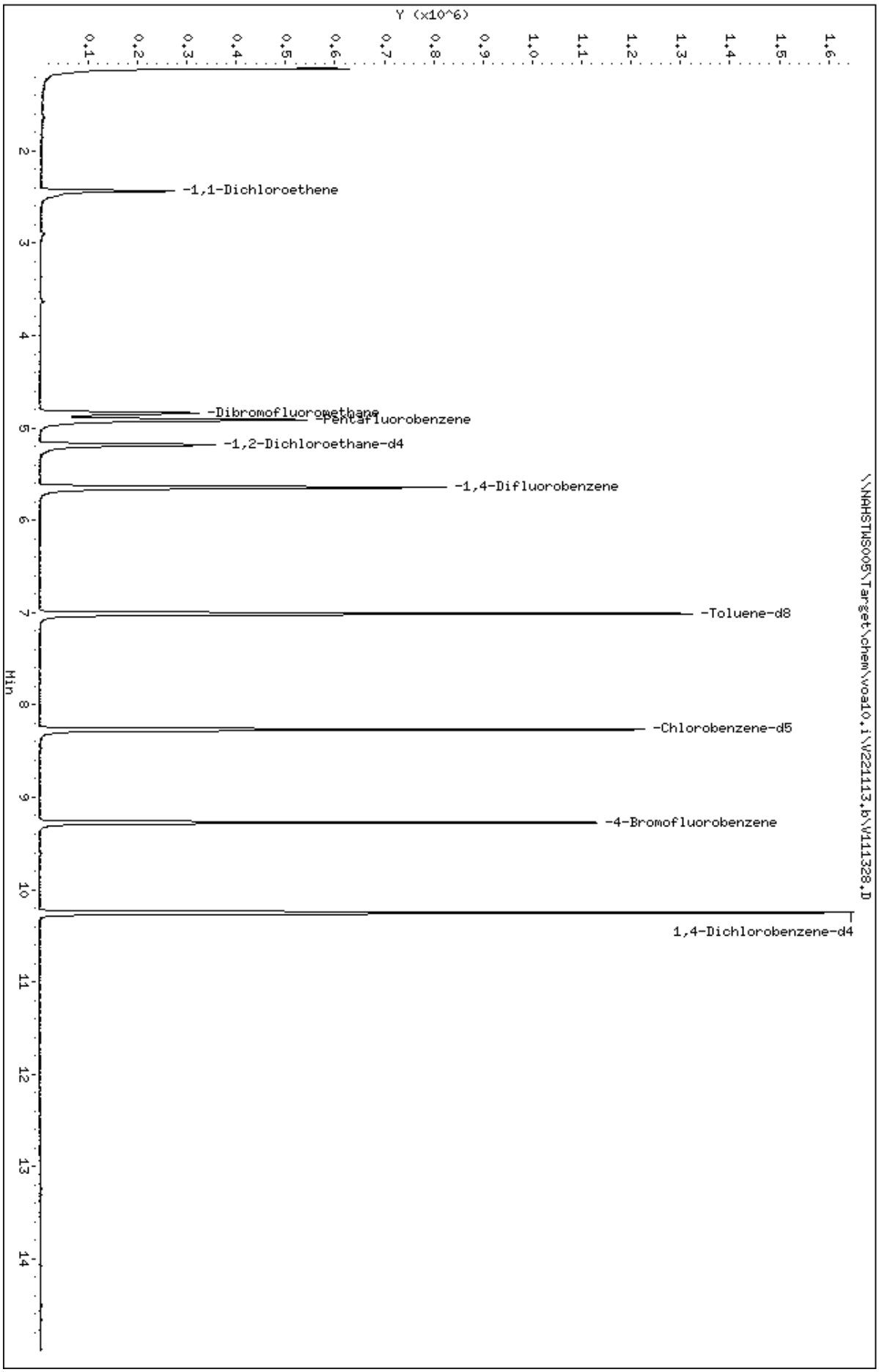
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.912	4.916	(1.000)	454185	50.0000	
11 1,1-Dichloroethene	96	2.435	2.438	(0.496)	107633	39.6428	39.64
$ 30 Dibromofluoromethane	113	4.841	4.845	(0.986)	227920	59.3942	59.39(M)
$ 35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.055)	280175	57.4915	57.49
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	684900	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	627397	50.0000	
$ 48 Toluene-d8	98	7.012	7.012	(0.848)	805712	50.9496	50.94
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	306470	49.1117	49.11
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	398091	50.0000	

QC Flag Legend

M - Compound response manually integrated.



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111328.D
Date : 13-NOV-2022 20:27
Client ID: HS22110553-12
Sample Info: HS22110553-12;HS22110553-12;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111328.D Page 2

Date : 13-NOV-2022 20:27

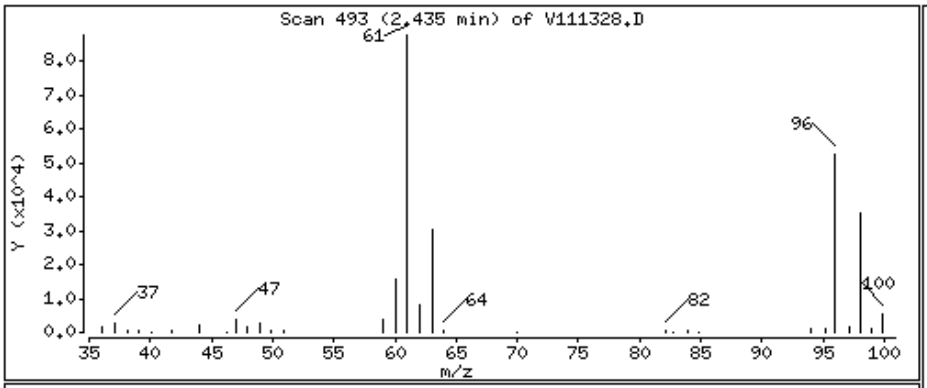
Client ID: HS22110553-12 Instrument: voa10.i

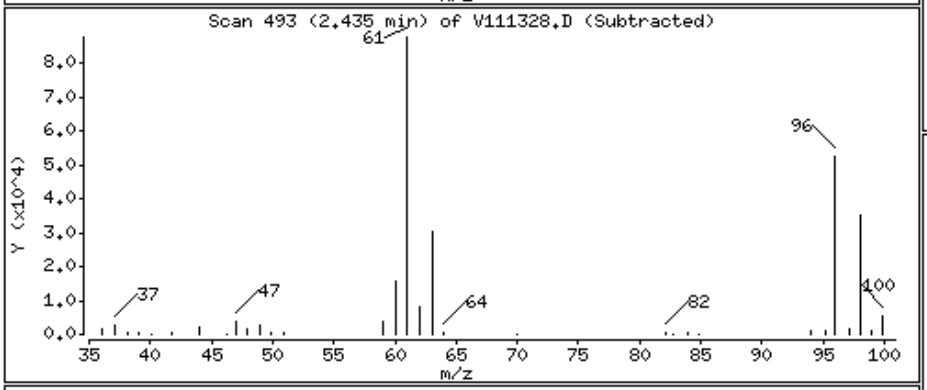
Sample Info: HS22110553-12;HS22110553-12;;;

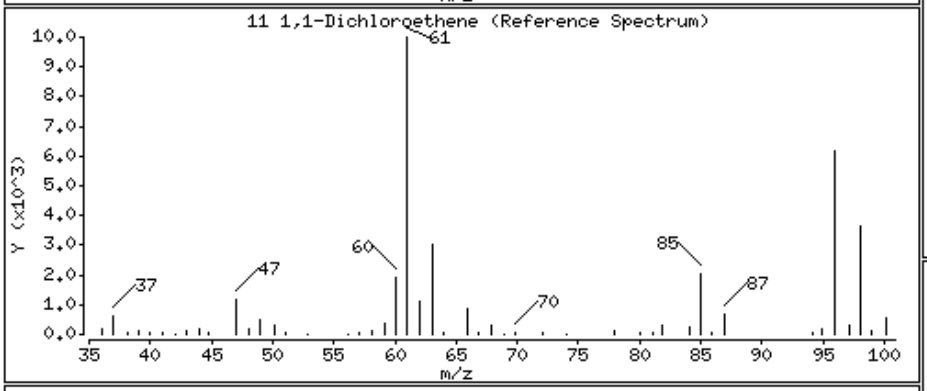
Purge Volume: 5.0 Operator: PC

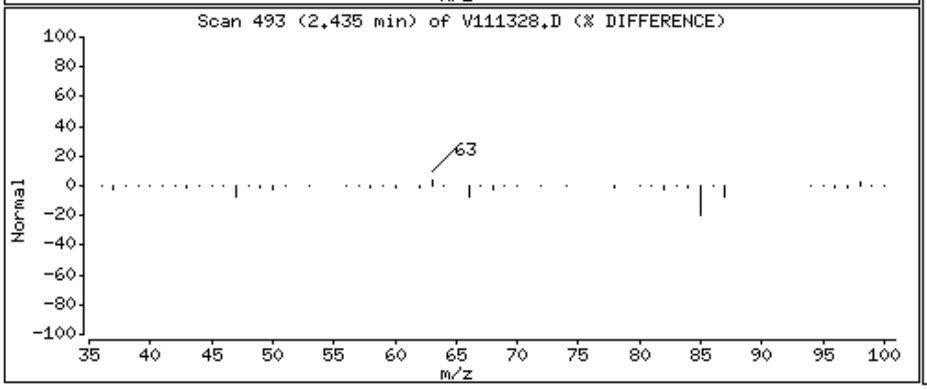
Column phase: DB624 Column diameter: 0.18

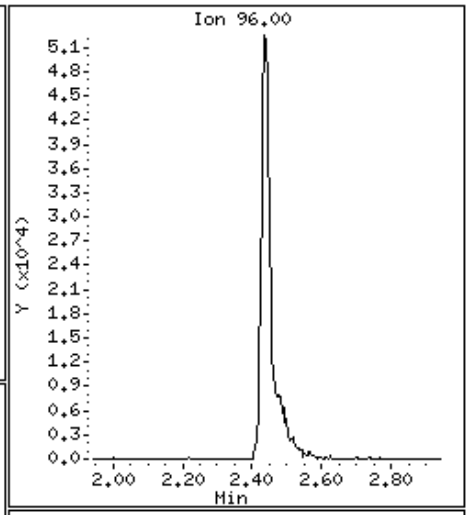
11 1,1-Dichloroethene Concentration: 39.64 ug/l

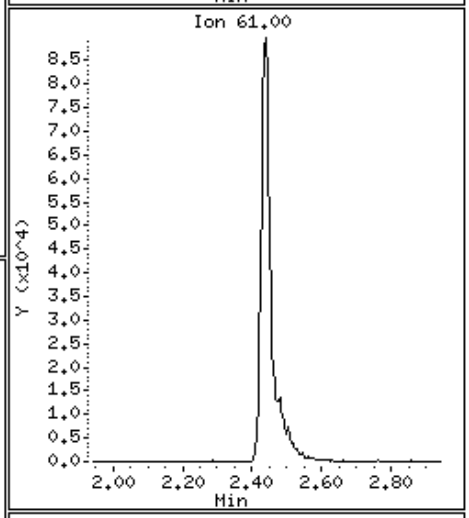


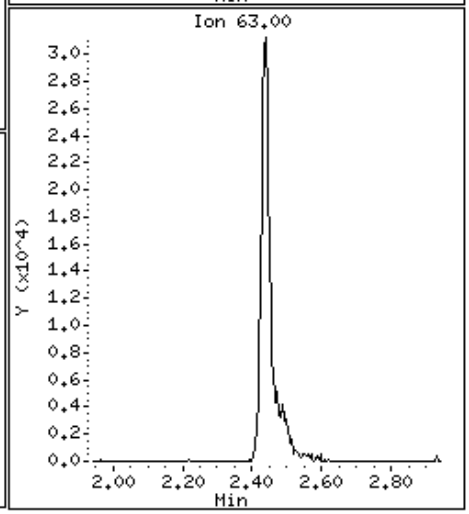












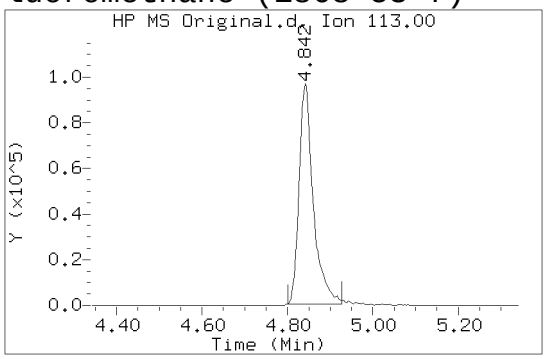
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111328.D
Inj Date : 13-NOV-2022 20:27
InstruID : voa10.i
LabSampID : HS22110553-12

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

MASS
113
AREA
227920
HEIGHT
96656
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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AREA
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HEIGHT
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18-Nov-2022
12:49
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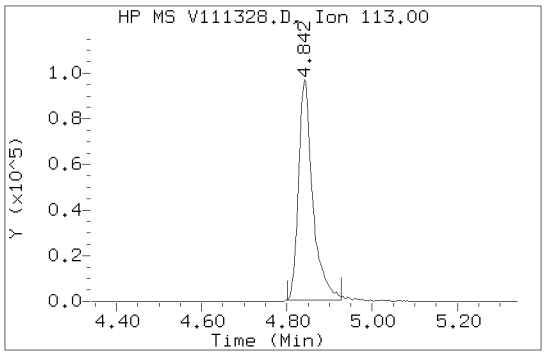

BEFORE

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17-Nov-2022
13:52
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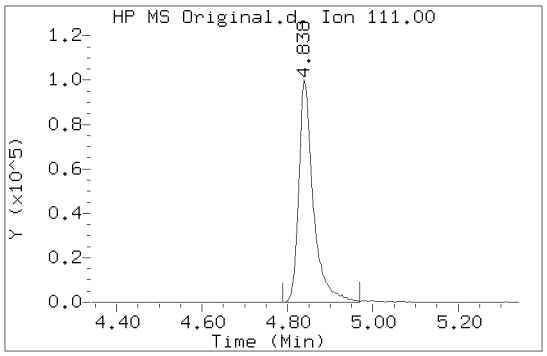
pham



AFTER

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AREA
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HEIGHT
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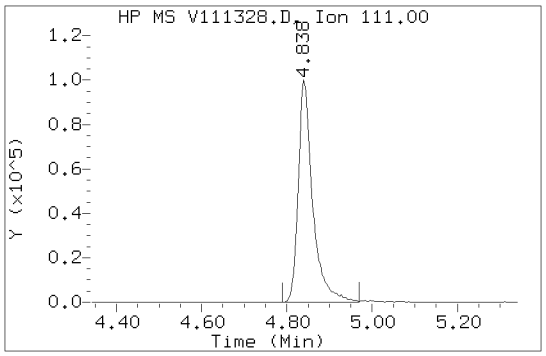
18-Nov-2022
12:49
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D
Lab Smp Id: HS22110553-06 Client Smp ID: HS22110553-06
Inj Date : 13-NOV-2022 20:47
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-06;HS22110553-06;;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:49 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 28
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

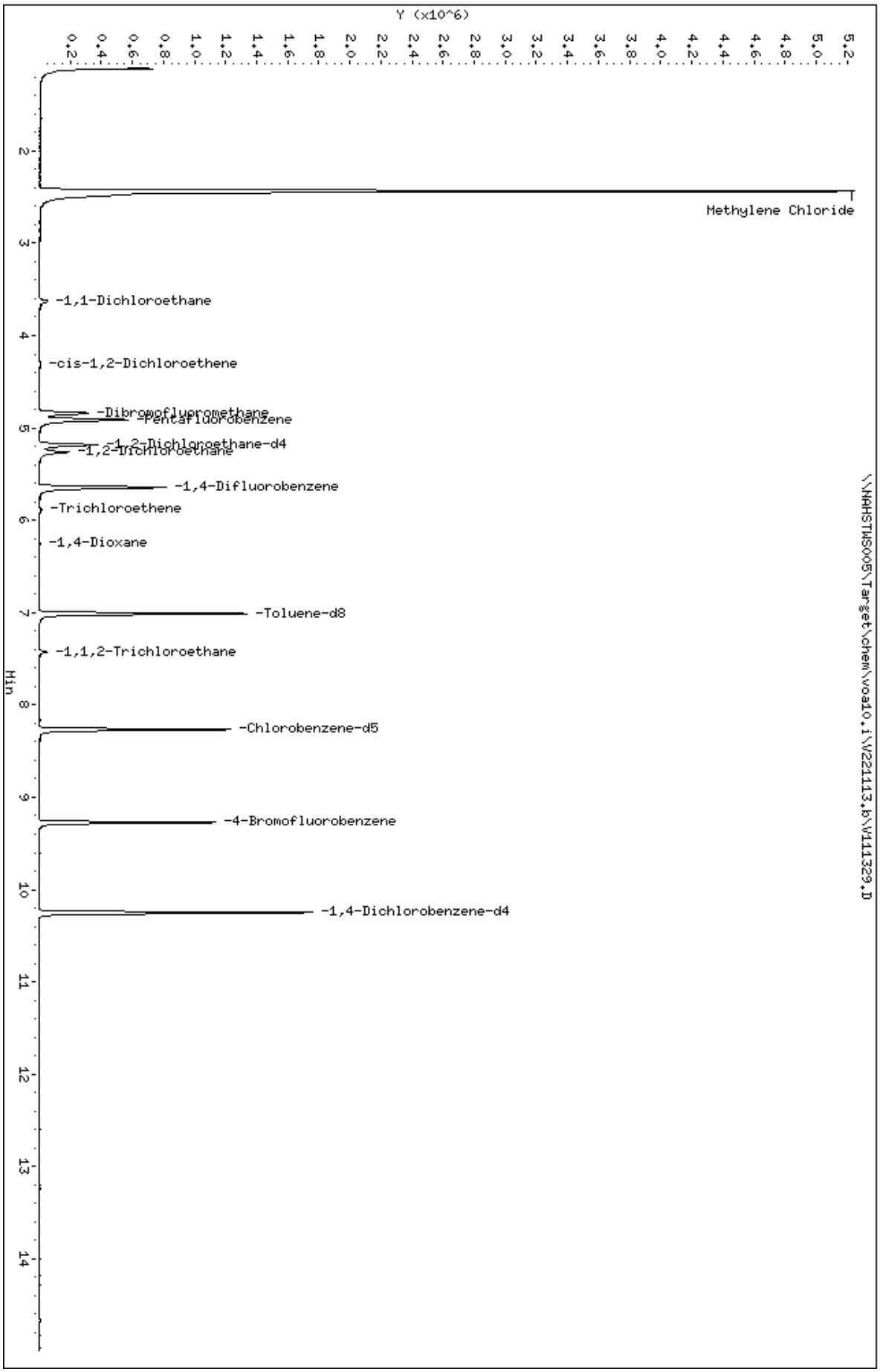
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

		QUANT SIG					CONCENTRATIONS ON-COLUMN	FINAL
Compounds		MASS	RT	EXP RT	REL RT	RESPONSE	(ug/l)	(ug/l)
*	1 Pentafluorobenzene	168	4.916	4.916	(1.000)	467919	50.0000	
	17 Methylene Chloride	84	2.434	2.896	(0.495)	19124	3.30394	3.30(a)
	22 1,1-Dichloroethane	63	3.626	3.630	(0.738)	65467	9.93094	9.93
	27 cis-1,2-Dichloroethene	96	4.316	4.305	(0.878)	4344	1.02112	1.02(a)
$	30 Dibromofluoromethane	113	4.841	4.845	(0.985)	221353	55.9898	55.98
	33 1,2-Dichloroethane	62	5.261	5.265	(0.932)	156958	24.1490	24.14
$	35 1,2-Dichloroethane-d4	65	5.182	5.186	(1.054)	286247	57.0135	57.01
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	703338	50.0000	
	38 Trichloroethene	130	5.887	5.887	(1.043)	6271	1.36862	1.36(a)
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	631212	50.0000	
$	48 Toluene-d8	98	7.011	7.012	(0.848)	818171	51.4222	51.42
	53 1,1,2-Trichloroethane	83	7.431	7.428	(0.899)	11980	3.21778	3.21(a)
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	310817	49.4997	49.49
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	411700	50.0000	
M	94 1,2-Dichloroethylene (total)	96				4344	1.02112	1.02(a)
	135 1,4-Dioxane	88	6.247	6.247	(1.271)	2381	55.5130	55.51(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).



Data File: \\NAHSTMS005\Target\chem\voa10.i\V221113.b\V111329.D
Date : 13-NOV-2022 20:47
Client ID: HS22110553-06
Sample Info: HS22110553-06;HS22110553-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 2

Date : 13-NOV-2022 20:47

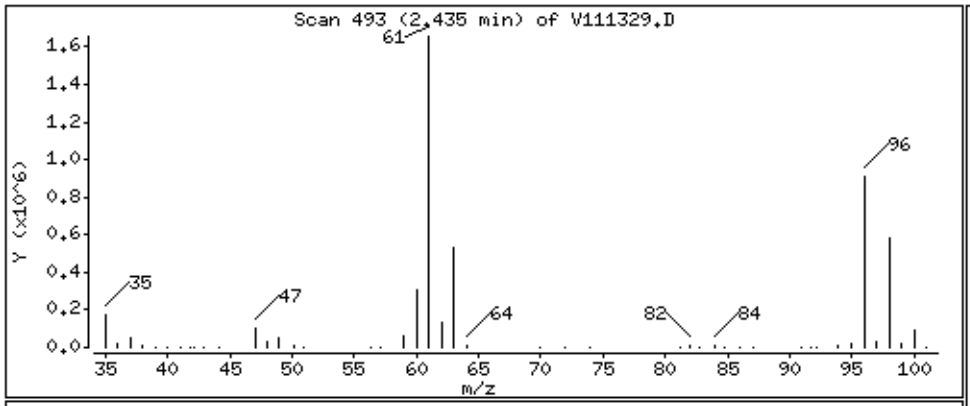
Client ID: HS22110553-06 Instrument: voa10.i

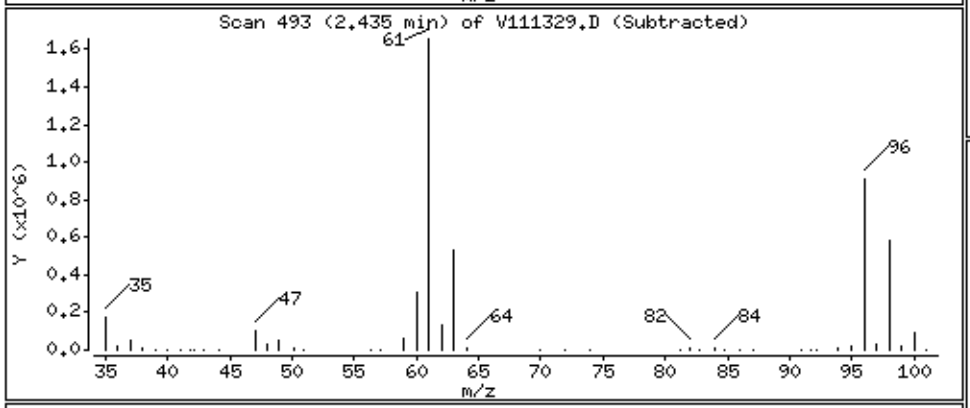
Sample Info: HS22110553-06;HS22110553-06;;;

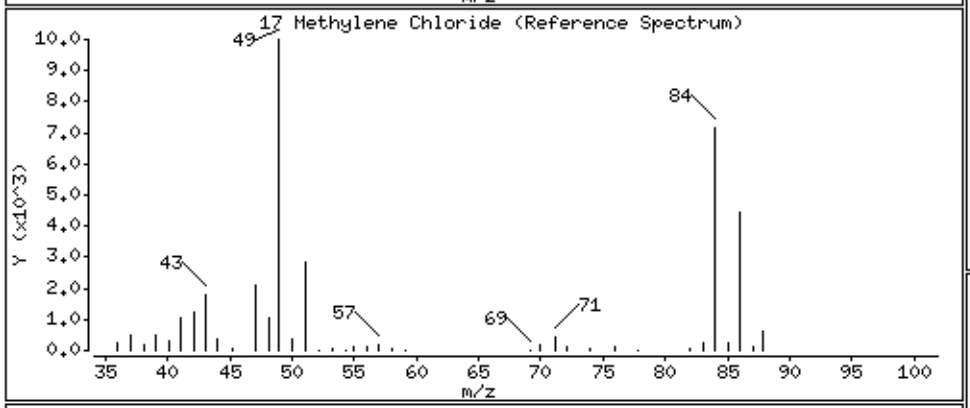
Purge Volume: 5.0 Operator: PC

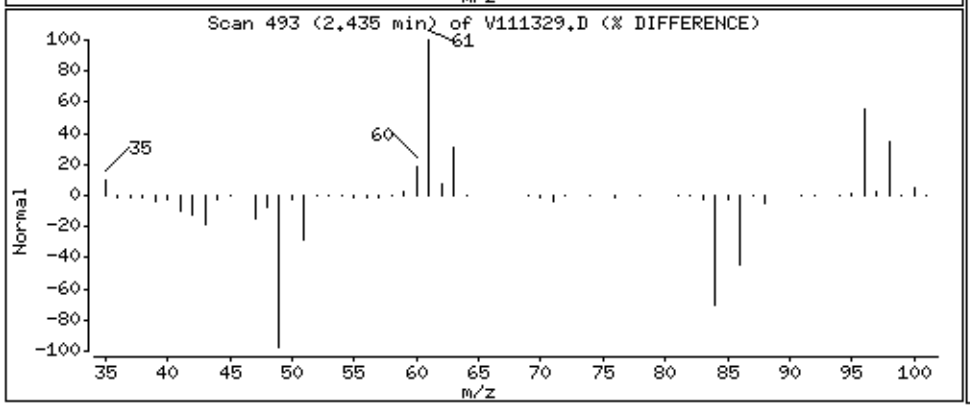
Column phase: DB624 Column diameter: 0.18

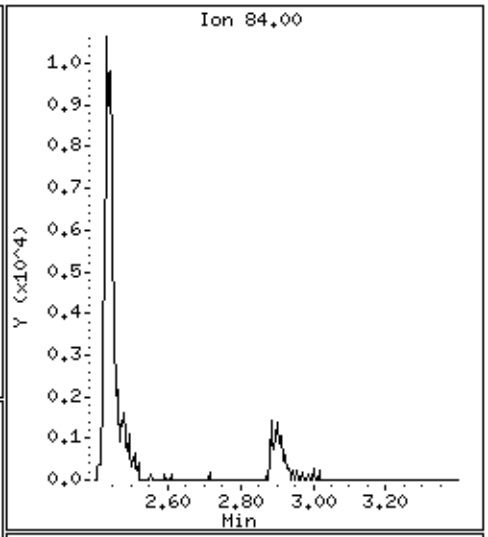
17 Methylene Chloride Concentration: 3.30 ug/l

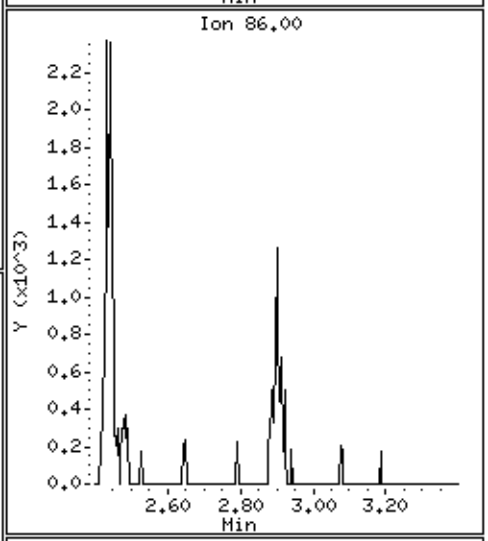


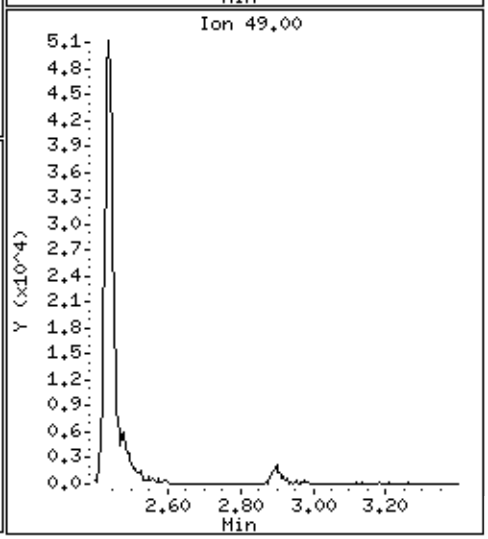












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 3

Date : 13-NOV-2022 20:47

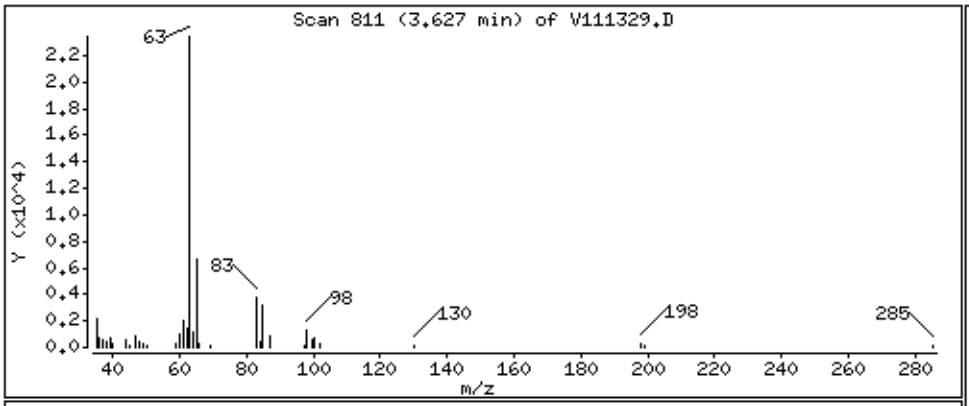
Client ID: HS22110553-06 Instrument: voa10.i

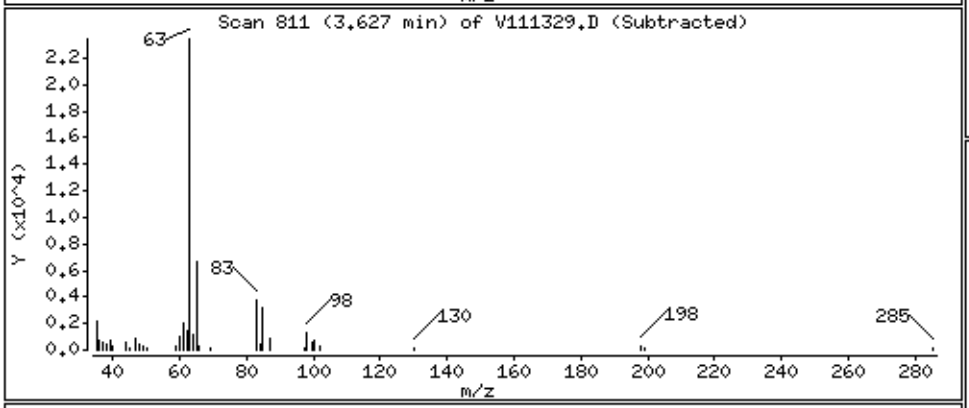
Sample Info: HS22110553-06;HS22110553-06;;;

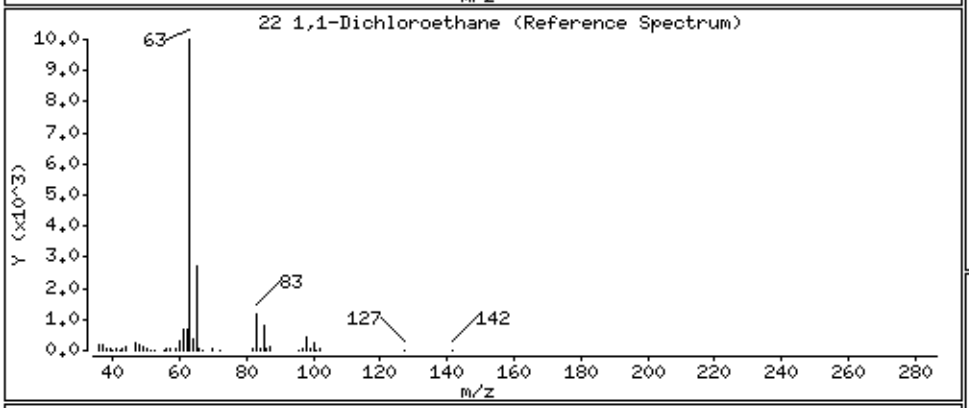
Purge Volume: 5.0 Operator: PC

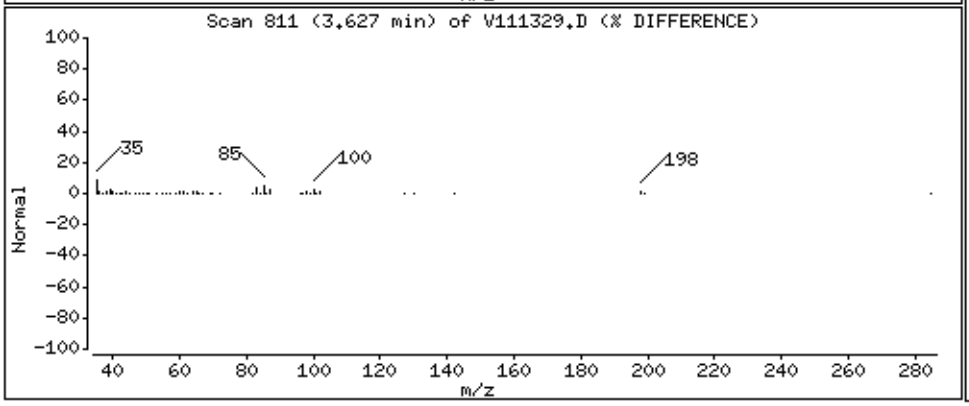
Column phase: DB624 Column diameter: 0.18

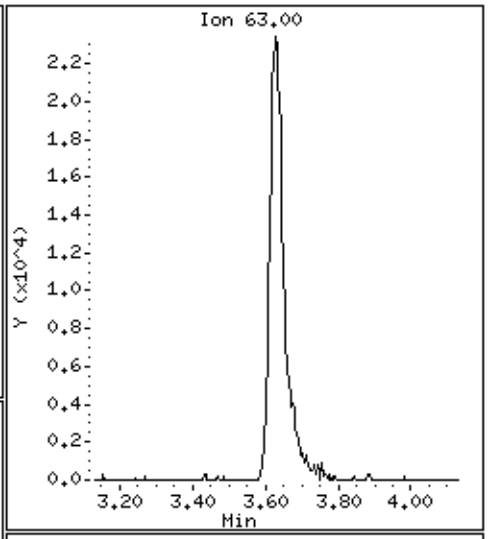
22 1,1-Dichloroethane Concentration: 9.93 ug/l

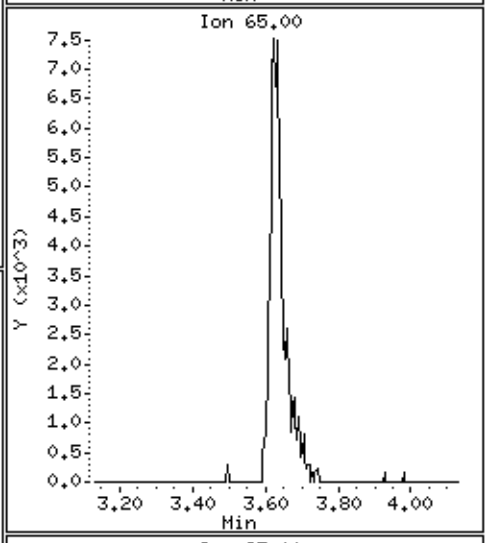


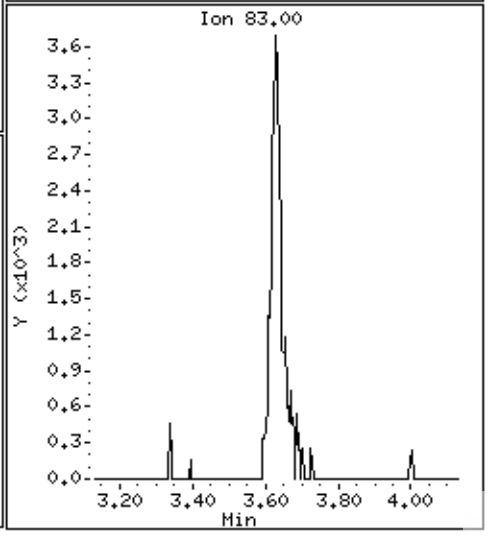












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 4

Date : 13-NOV-2022 20:47

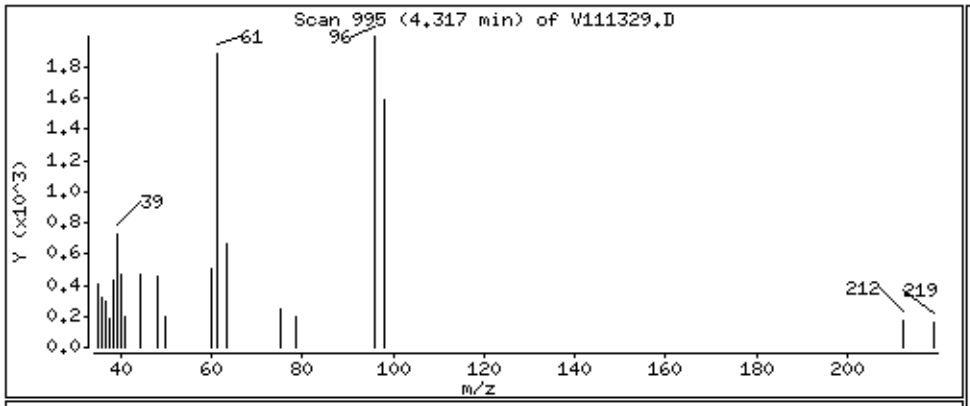
Client ID: HS22110553-06 Instrument: voa10.i

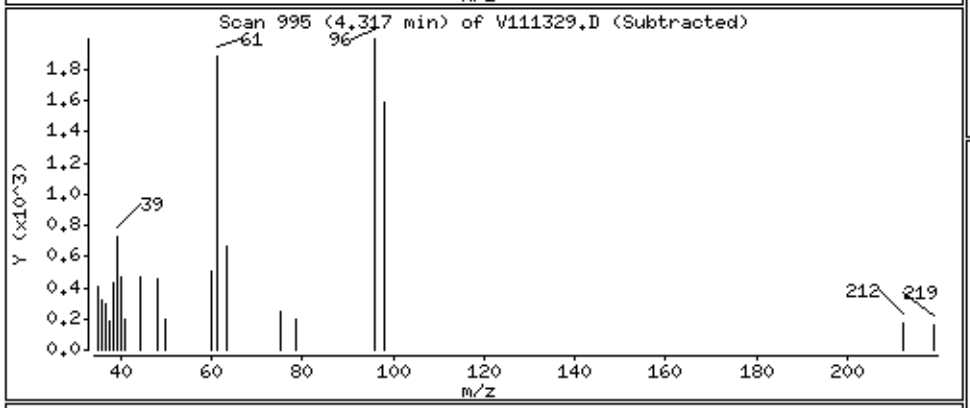
Sample Info: HS22110553-06;HS22110553-06;;;

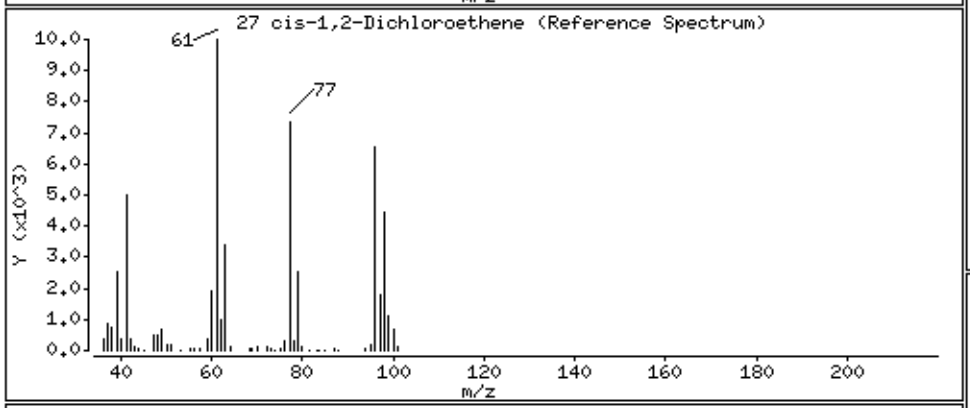
Purge Volume: 5.0 Operator: PC

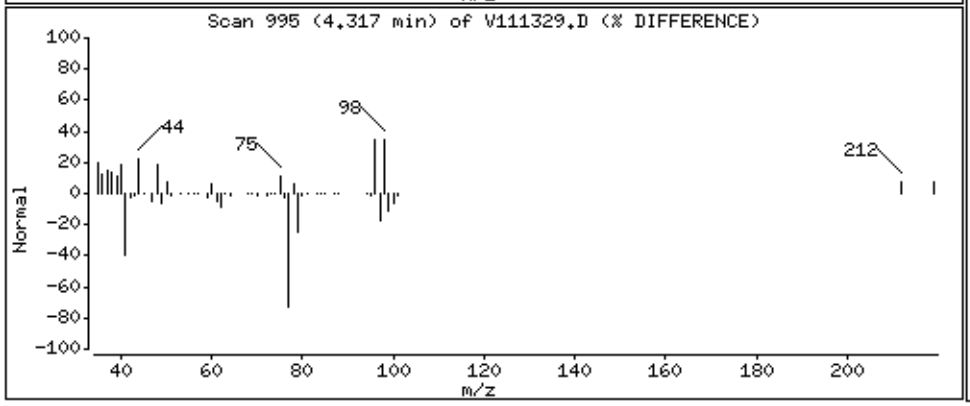
Column phase: DB624 Column diameter: 0.18

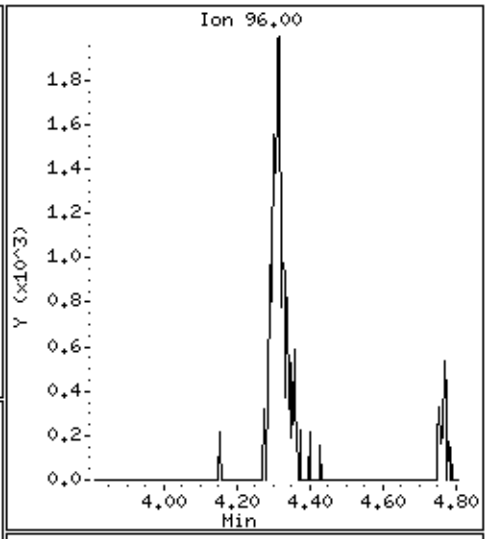
27 cis-1,2-Dichloroethene Concentration: 1.02 ug/l

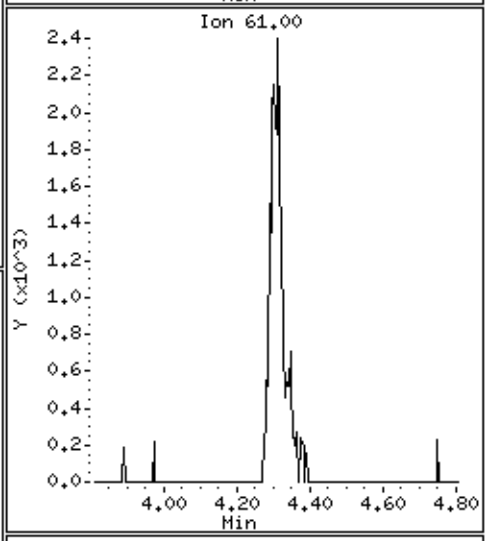


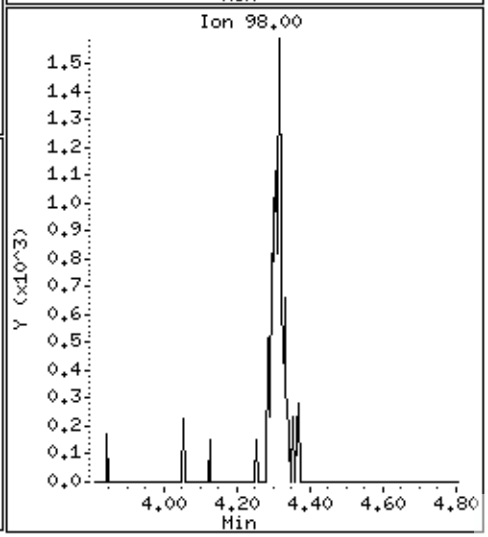












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 5

Date : 13-NOV-2022 20:47

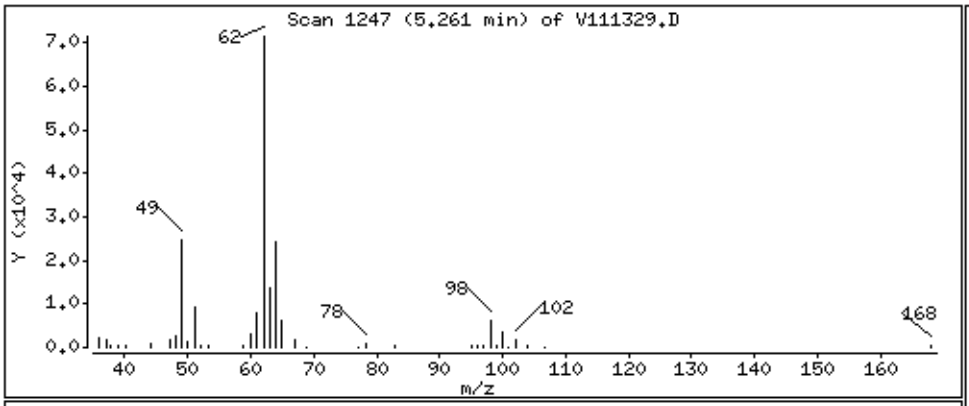
Client ID: HS22110553-06 Instrument: voa10.i

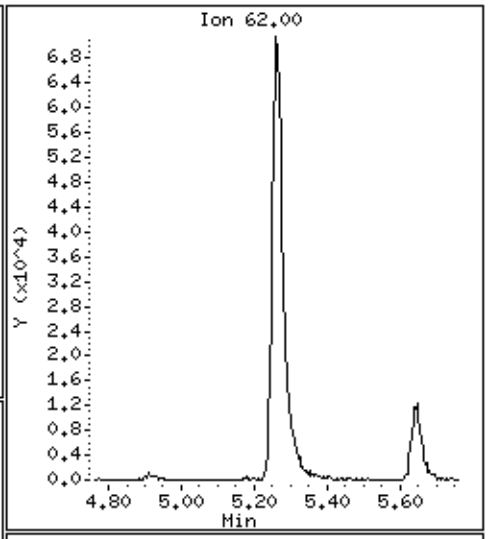
Sample Info: HS22110553-06;HS22110553-06;;;

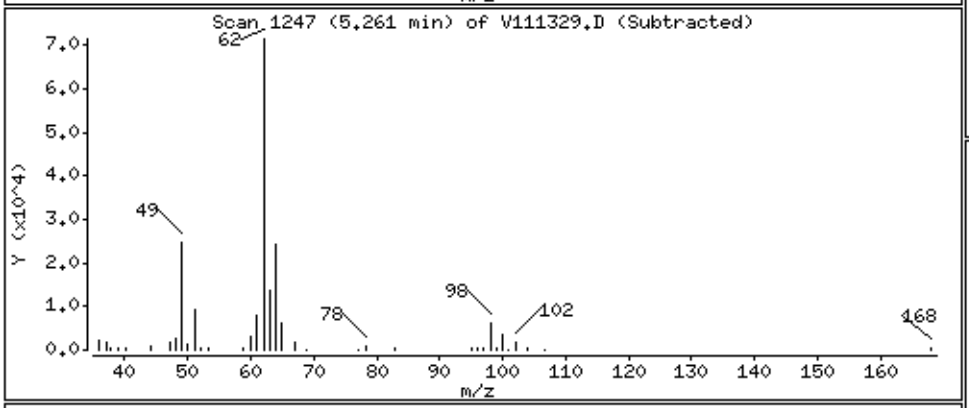
Purge Volume: 5.0 Operator: PC

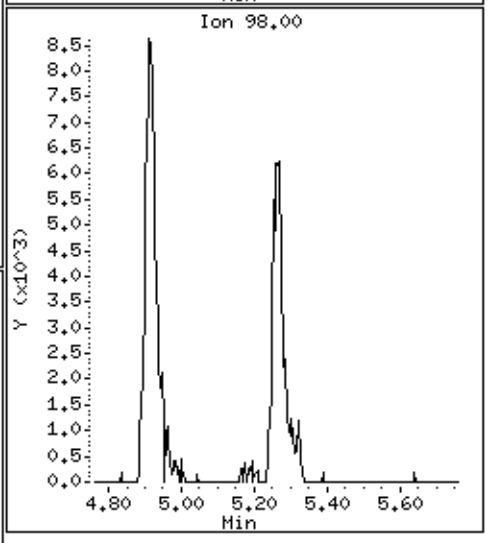
Column phase: DB624 Column diameter: 0.18

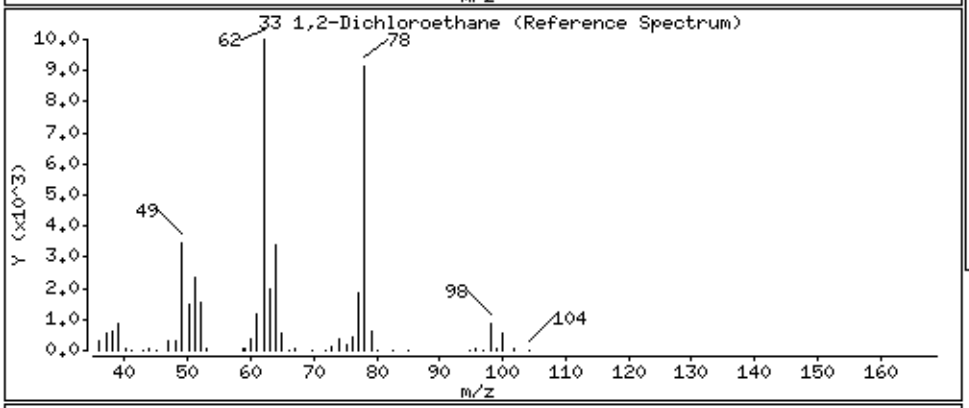
33 1,2-Dichloroethane Concentration: 24.14 ug/l

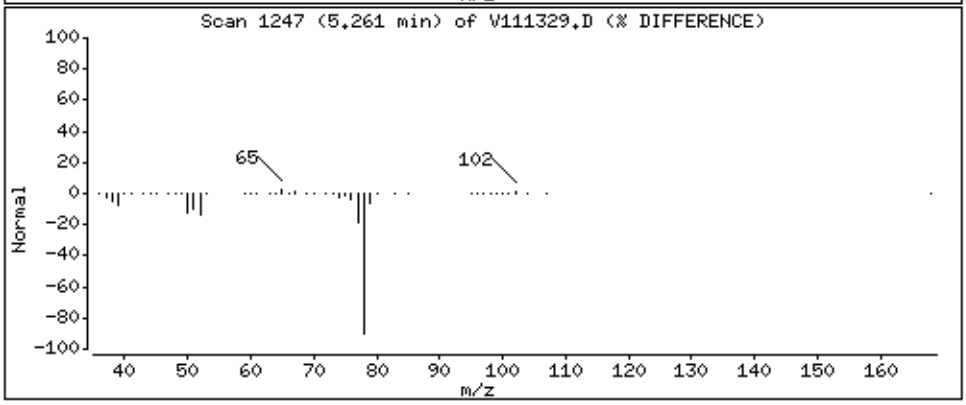












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 6

Date : 13-NOV-2022 20:47

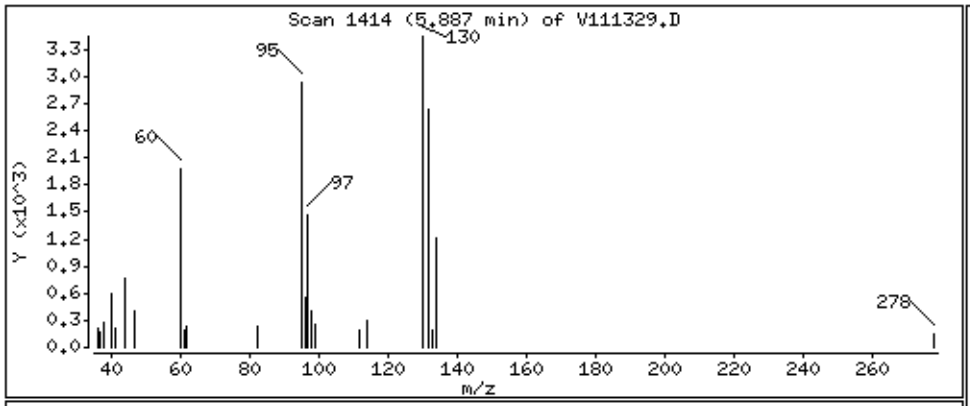
Client ID: HS22110553-06 Instrument: voa10.i

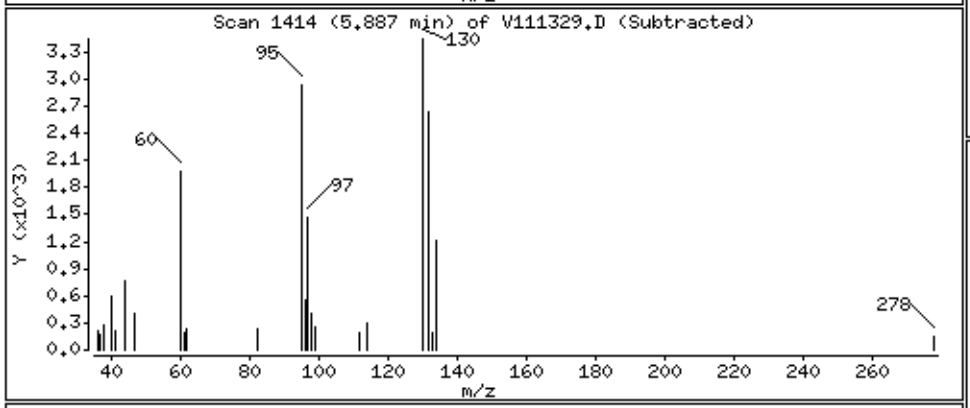
Sample Info: HS22110553-06;HS22110553-06;;;

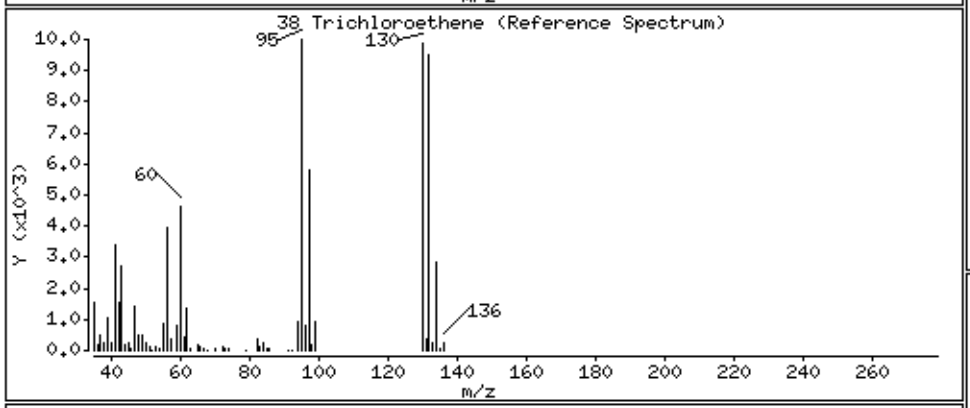
Purge Volume: 5.0 Operator: PC

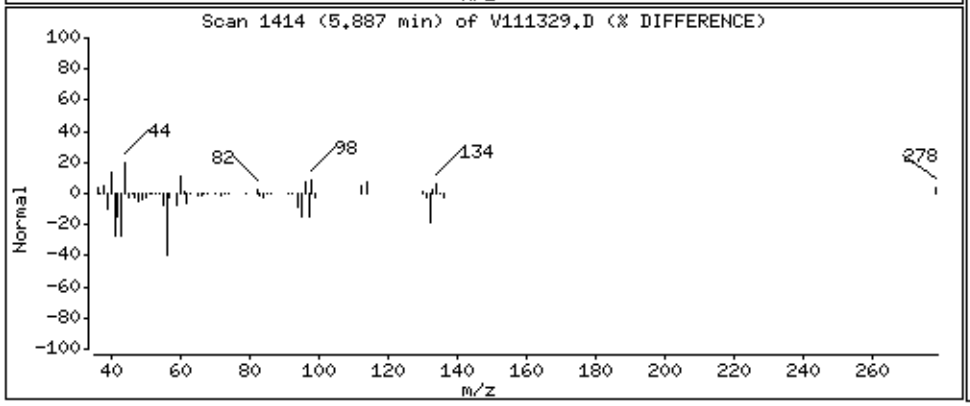
Column phase: DB624 Column diameter: 0.18

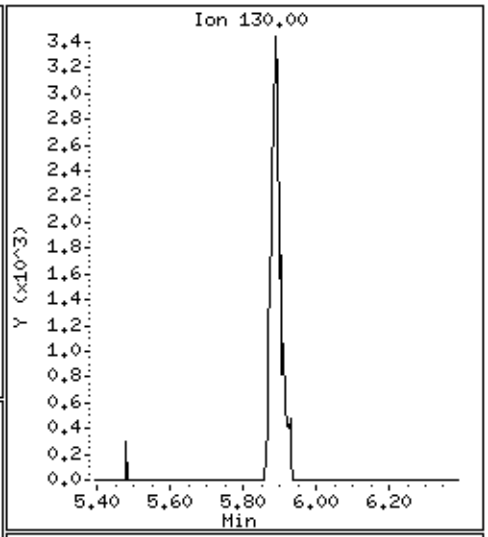
38 Trichloroethene Concentration: 1.36 ug/l

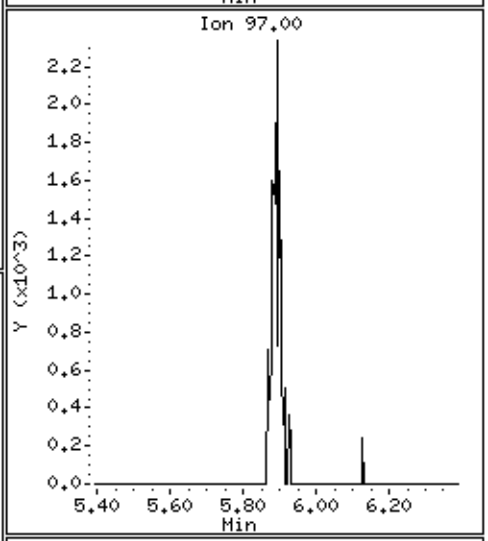


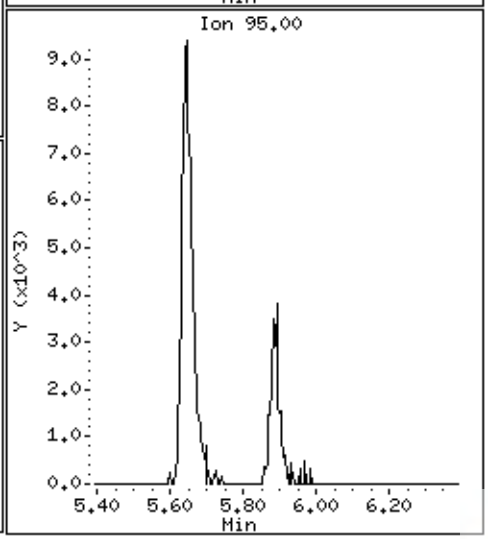












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D Page 7

Date : 13-NOV-2022 20:47

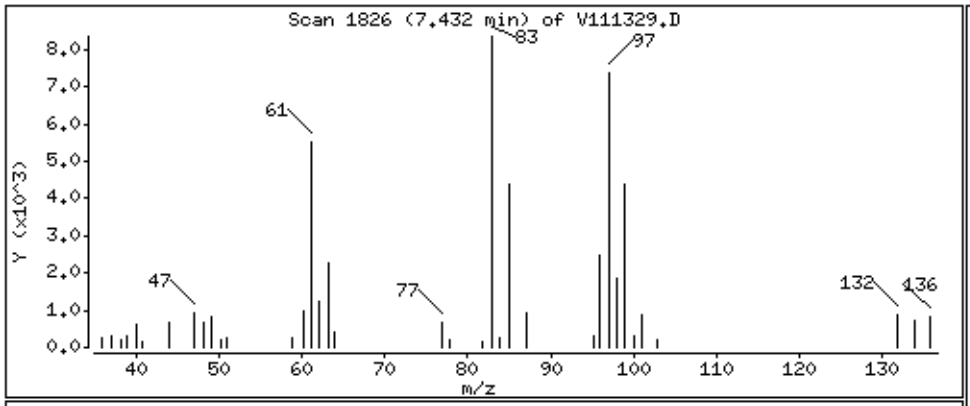
Client ID: HS22110553-06 Instrument: voa10.i

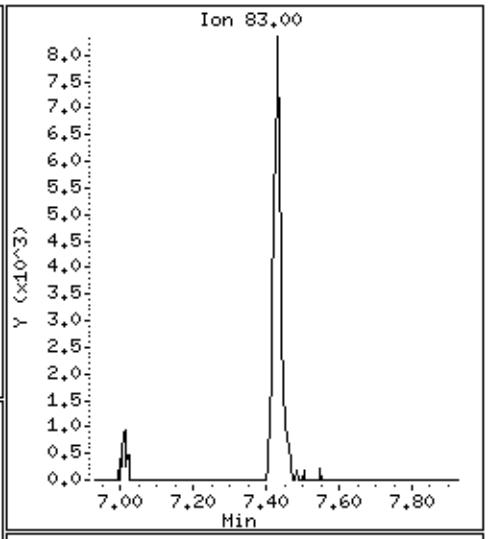
Sample Info: HS22110553-06;HS22110553-06;;;

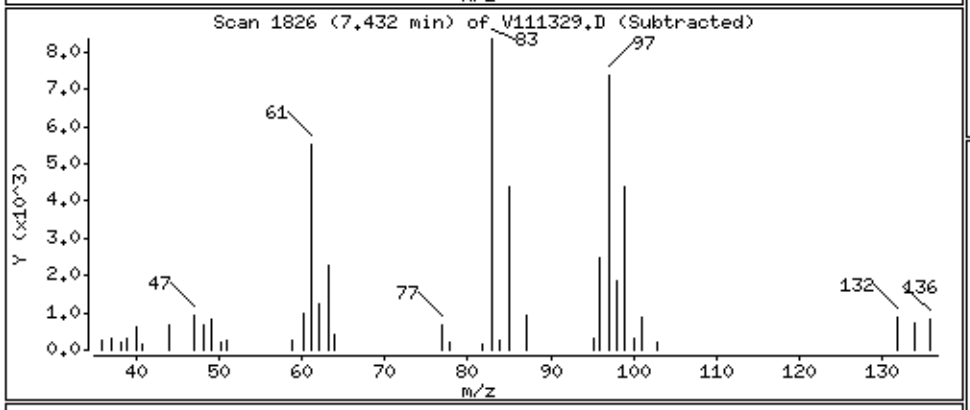
Purge Volume: 5.0 Operator: PC

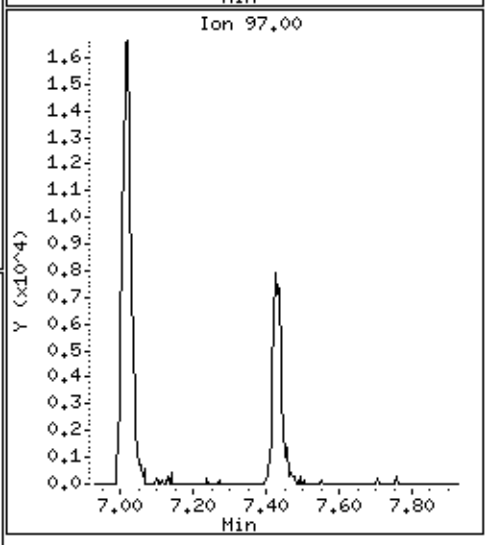
Column phase: DB624 Column diameter: 0.18

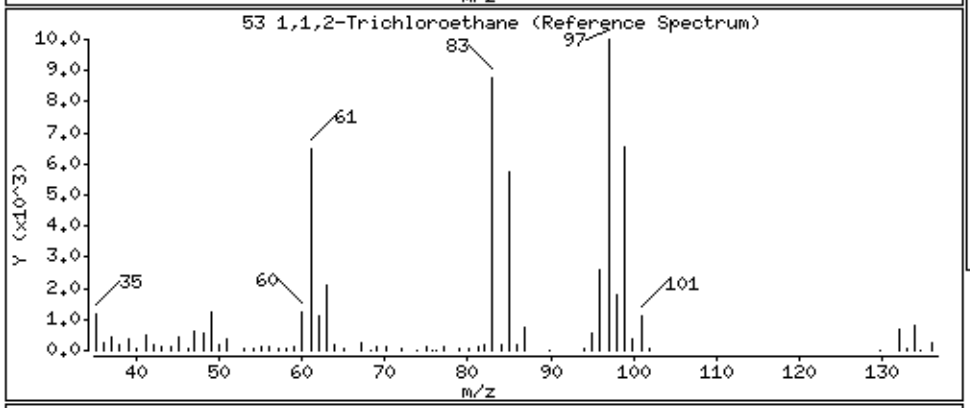
53 1,1,2-Trichloroethane Concentration: 3.21 ug/l

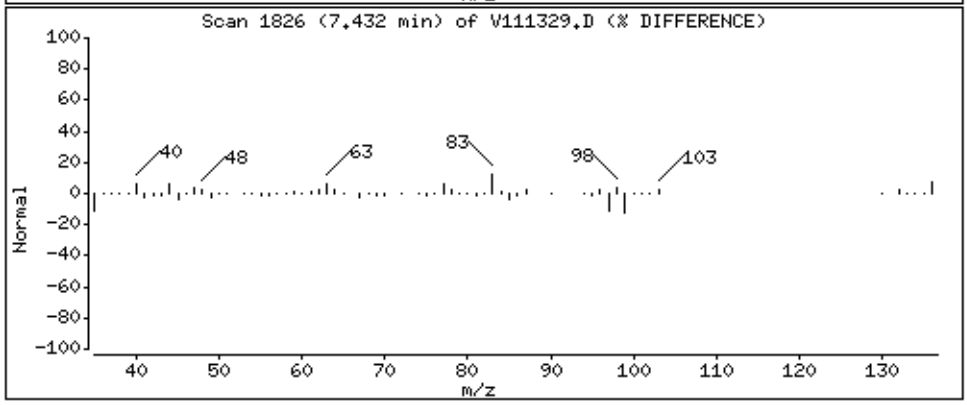












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D

Date : 13-NOV-2022 20:47

Client ID: HS22110553-06

Instrument: voa10.i

Sample Info: HS22110553-06;HS22110553-06;;;

Purge Volume: 5.0

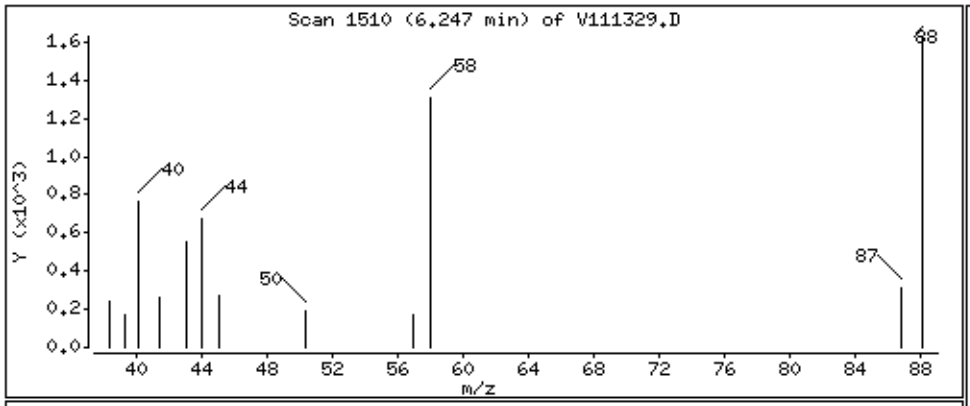
Operator: PC

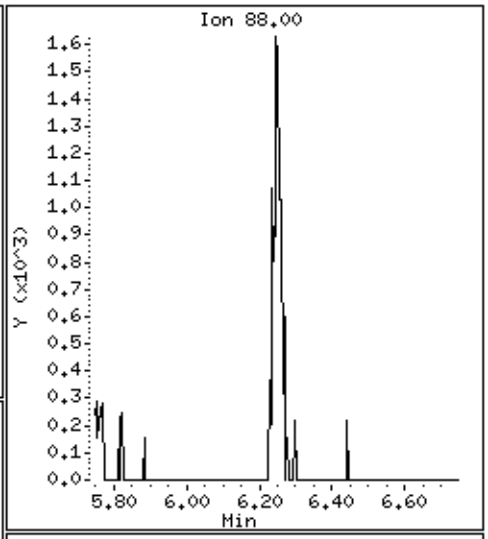
Column phase: DB624

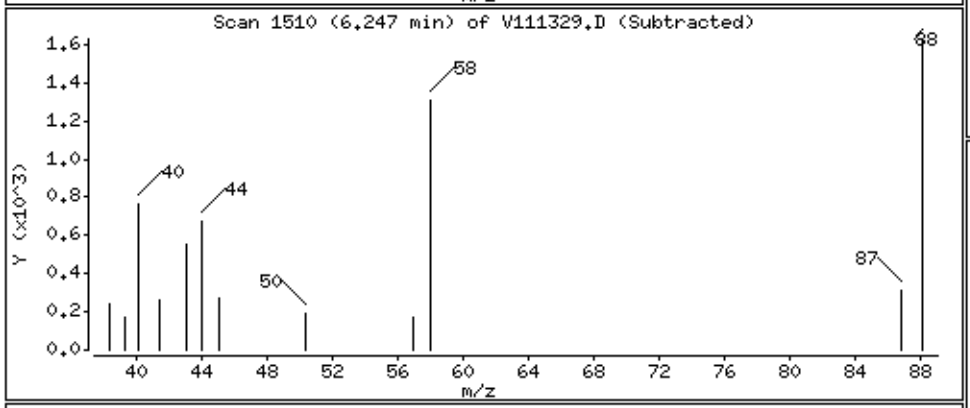
Column diameter: 0.18

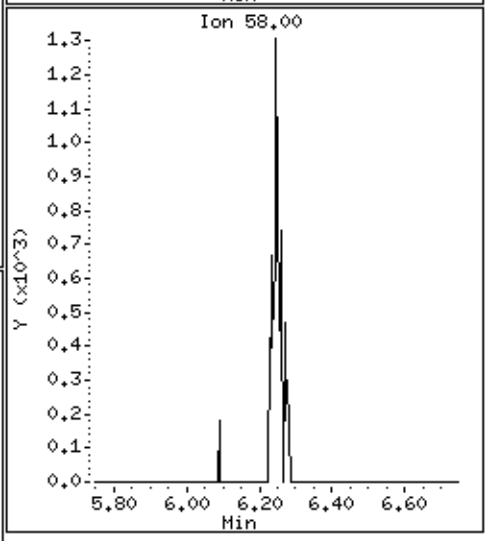
135 1,4-Dioxane

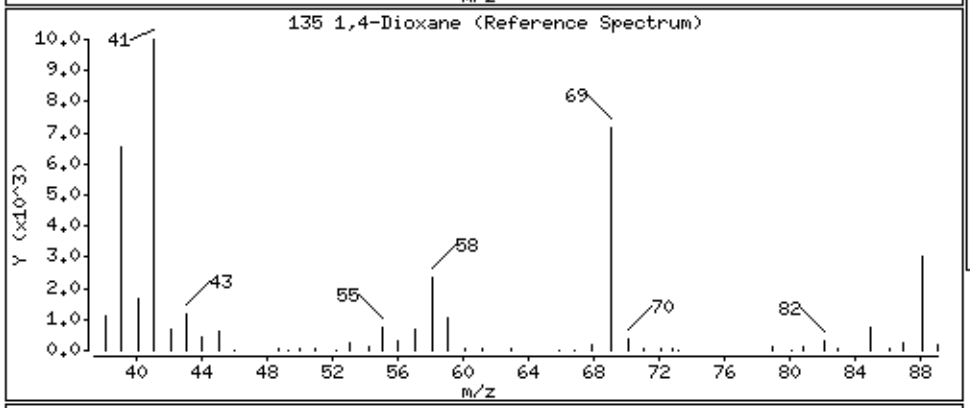
Concentration: 55.51 ug/l

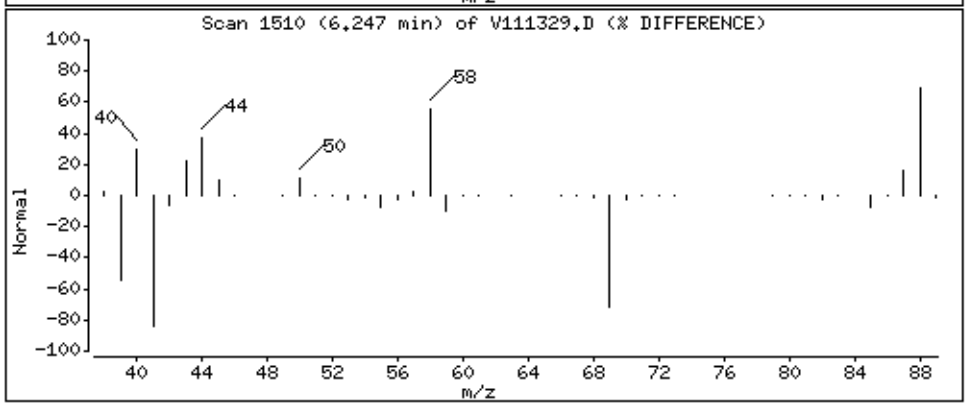












Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111329.D
Inj Date : 13-NOV-2022 20:47
InstruID : voa10.i
LabSampID : HS22110553-06

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111330.D Page 1
Report Date: 18-Nov-2022 12:50

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111330.D
Lab Smp Id: VSTD050-END Client Smp ID: VSTD050-END
Inj Date : 13-NOV-2022 21:08
Operator : PC Inst ID: voa10.i
Smp Info : VSTD050-END;VSTD050-END;2;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\8260C.m
Meth Date : 18-Nov-2022 12:50 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 29 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	445004	50.0000	
2	Dichlorodifluoromethane	85	1.235	1.235	(0.251)	177405	50.0000	46.56
3	Chloromethane	50	1.370	1.370	(0.279)	202530	50.0000	48.70
5	Vinyl Chloride	62	1.448	1.448	(0.295)	201132	50.0000	48.70
6	Bromomethane	94	1.703	1.703	(0.347)	87864	50.0000	47.13
7	Chloroethane	64	1.782	1.782	(0.363)	116344	50.0000	48.90
8	Trichlorofluoromethane	101	1.992	1.992	(0.405)	250910	50.0000	46.23
9	Acrolein	56	2.348	2.348	(0.478)	24454	100.000	136.02
10	Acetone	43	2.491	2.491	(0.507)	151468	100.000	82.22
11	1,1-Dichloroethene	96	2.434	2.434	(0.495)	140294	50.0000	51.37
15	Iodomethane	142	2.569	2.569	(0.523)	316248	100.000	90.70
16	Acrylonitrile	53	3.147	3.147	(0.640)	174527	100.000	106.33
17	Methylene Chloride	84	2.899	2.899	(0.590)	186385	50.0000	64.27
18	Methyl tert-butyl ether	73	3.195	3.195	(0.650)	598039	50.0000	52.60
19	Carbon Disulfide	76	2.633	2.633	(0.536)	907466	100.000	115.85
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	166697	50.0000	48.97
21	Vinyl Acetate	43	3.713	3.713	(0.755)	682833	100.000	75.65(M)
22	1,1-Dichloroethane	63	3.630	3.630	(0.738)	329761	50.0000	52.77
24	2-Butanone	43	4.354	4.354	(0.886)	222636	100.000	96.48
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	231090	50.0000	42.90

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	200658	50.0000	49.59
28 Chloroform	83	4.672	4.672 (0.950)	354305	50.0000	48.46

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111330.D Page 2
Report Date: 18-Nov-2022 12:50

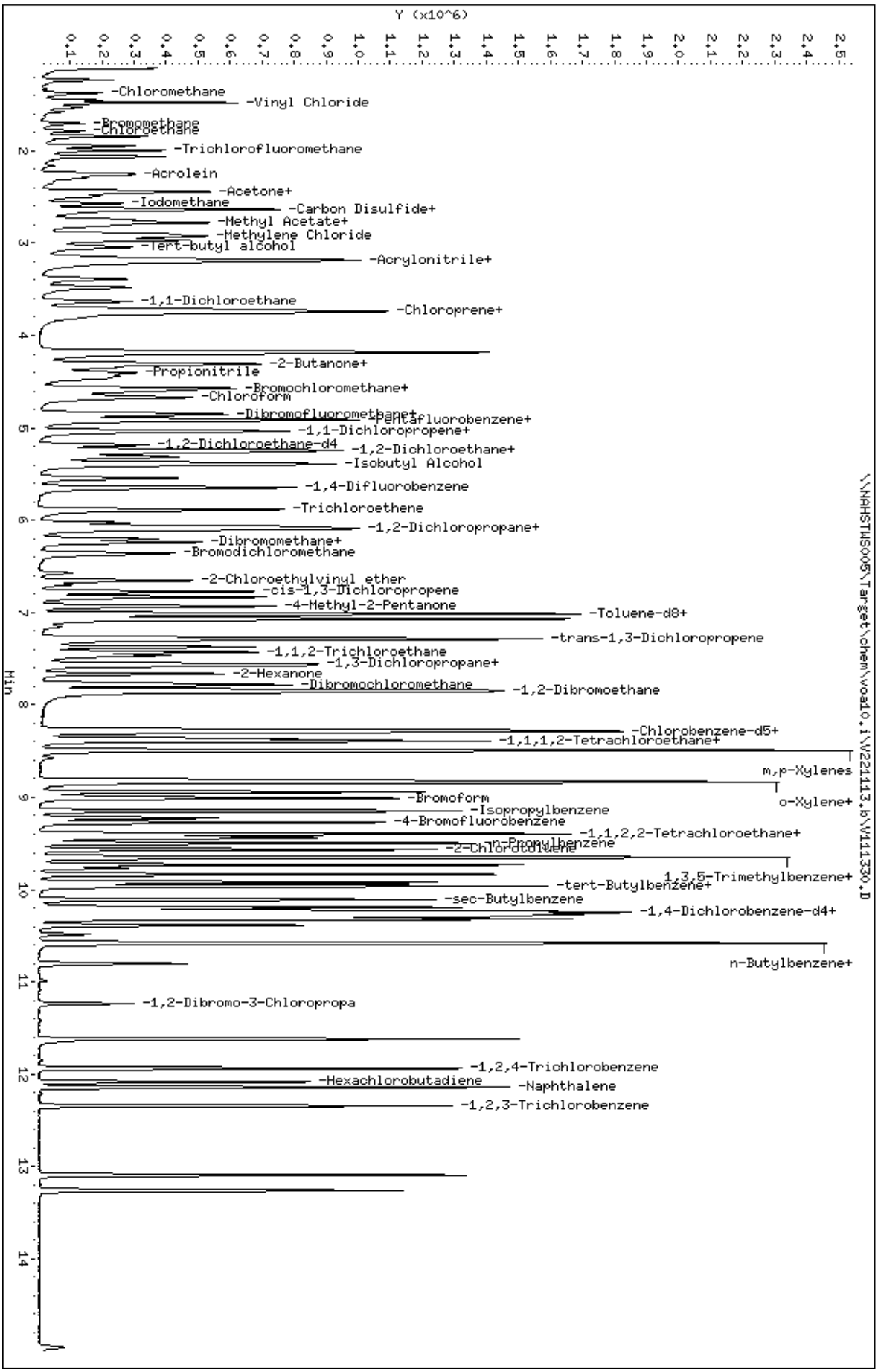
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.567	4.567	(0.929)	110814	50.0000	54.74
$	30 Dibromofluoromethane	113	4.845	4.845	(0.986)	206057	50.0000	54.80
	31 1,1,1-Trichloroethane	97	4.863	4.863	(0.989)	272735	50.0000	46.43
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	244099	50.0000	46.34
	33 1,2-Dichloroethane	62	5.261	5.261	(0.932)	299513	50.0000	47.41
	34 Carbon Tetrachloride	117	5.032	5.032	(0.891)	203883	50.0000	44.73
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	248179	50.0000	51.97
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	683508	50.0000	
	37 Benzene	78	5.242	5.242	(0.928)	828467	50.0000	47.61
	38 Trichloroethene	130	5.883	5.883	(1.042)	208947	50.0000	46.92
	39 Bromodichloromethane	83	6.359	6.359	(1.126)	254105	50.0000	46.81
	41 2-Chloroethylvinyl ether	63	6.652	6.652	(1.178)	185637	100.000	100.62
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	230120	50.0000	47.33
	44 Dibromomethane	93	6.202	6.202	(1.098)	128870	50.0000	46.30
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	496535	100.000	91.50
	46 cis-1,3-Dichloropropene	75	6.775	6.775	(1.200)	353040	50.0000	48.67
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	596271	50.0000	
$	48 Toluene-d8	98	7.011	7.011	(0.848)	790744	50.0000	52.60
	50 Toluene	91	7.071	7.071	(0.855)	827914	50.0000	47.10
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.287)	304276	50.0000	47.73
	52 2-Hexanone	43	7.664	7.664	(0.927)	350274	100.000	90.94
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	165483	50.0000	47.05
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	344990	50.0000	47.75
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	210858	50.0000	45.94
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	161559	50.0000	44.28
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	200915	50.0000	46.66
	58 1-Chlorohexane	55	8.282	8.282	(1.467)	157872	50.0000	41.95
	59 Chlorobenzene	112	8.293	8.293	(1.003)	530288	50.0000	44.21
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	199560	50.0000	46.43
	61 Ethylbenzene	106	8.391	8.391	(1.015)	259005	50.0000	44.08
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	647417	100.000	89.51
	63 o-Xylene	106	8.830	8.830	(1.068)	321497	50.0000	44.50
	64 Styrene	104	8.841	8.841	(1.069)	593742	50.0000	45.25
	66 Bromoform	173	8.991	8.991	(1.088)	159716	50.0000	46.04
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	740226	50.0000	41.29
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	286033	50.0000	46.10
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	291205	50.0000	49.10
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	377907	50.0000	
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	353388	50.0000	43.99
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	883879	50.0000	42.87
	74 Bromobenzene	156	9.396	9.396	(0.917)	262101	50.0000	45.44
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	668991	50.0000	43.45
	76 2-Chlorotoluene	91	9.564	9.564	(0.933)	600622	50.0000	45.44
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	714983	50.0000	44.41
	78 tert-Butylbenzene	119	9.920	9.920	(0.968)	537054	50.0000	40.44
	79 1,2,4-Trimethylbenzene	105	9.965	9.965	(0.972)	733275	50.0000	43.83
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	741037	50.0000	39.70
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	690468	50.0000	40.67
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	490289	50.0000	42.47
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	510431	50.0000	46.64
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	639595	50.0000	39.29
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	506614	50.0000	48.08

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	55211	50.0000	47.25
90	1,2,4-Trichlorobenzene	180	11.937	11.937 (1.165)	374147	50.0000	46.76

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)	
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	149899	50.0000	47.49	
	92 Naphthalene	128	12.143	12.143	(1.185)	964397	50.0000	45.37	
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	355556	50.0000	48.12	
M	94 1,2-Dichloroethylene (total)	96				367355	100.000		(a)
	135 1,4-Dioxane	88	6.247	6.247	(1.271)	42623	1000.00	797.77	
	141 Cyclohexane	56	4.912	4.912	(0.999)	237386	50.0000	56.72	
	138 Freon TF	101	2.453	2.453	(0.499)	120962	50.0000	51.22	
	147 Methylcyclohexane	55	6.067	6.067	(1.074)	242721	50.0000	38.75	
	146 Methyl Acetate	43	2.809	2.809	(0.571)	196678	50.0000	53.95	
	148 Tert-Butyl alcohol	59	3.045	3.045	(0.620)	384413	1000.00	689.58	
	149 Isopropyl Alcohol	45	2.637	2.637	(0.536)	285435	1000.00	725.93	
	72 trans-1,4-Dichloro-2-butene	53	9.444	9.444	(1.142)	94166	50.0000	43.26	
	12 Isobutyl Alcohol	43	5.377	5.377	(1.094)	688257	1000.00	991.92	
	13 Acetonitrile	39	2.779	2.779	(0.565)	304022	500.000	488.40	
	14 Allyl Chloride	41	2.775	2.775	(0.565)	669834	50.0000	70.42	
	25 Methacrylonitrile	41	4.579	4.579	(0.931)	203414	50.0000	54.85	
	40 Methyl Methacrylate	41	6.239	6.239	(1.269)	212842	50.0000	47.95	
	4 Propionitrile	54	4.406	4.406	(0.896)	354488	500.000	547.78	
	23 Chloroprene	53	3.731	3.731	(0.759)	284368	50.0000	51.77	
	49 Ethyl Methacrylate	69	6.239	6.239	(1.105)	146130	50.0000	49.96	

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111330.D
Date : 13-NOV-2022 21:08
Client ID: VSTD050-END
Sample Info: VSTD050-END;VSTD050-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

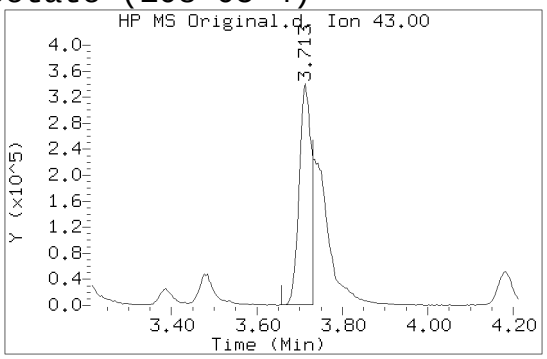
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221113.b\V111330.D
Inj Date : 13-NOV-2022 21:08
InstruID : voa10.i
LabSampID : VSTD050-END

Vinyl Acetate (108-05-4)

Reason Code:

BEFORE

MASS
43
AREA
682833
HEIGHT
340153
17-Nov-2022
13:52
linh
pham



AFTER

MASS
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AREA
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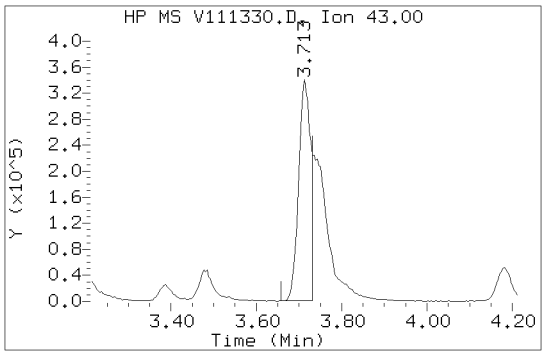
340153
18-Nov-2022
12:49
linh
pham



BEFORE

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HEIGHT
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17-Nov-2022
13:52
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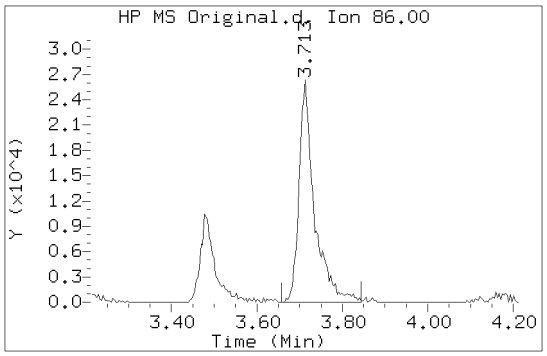
pham



AFTER

MASS
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18-Nov-2022
12:49
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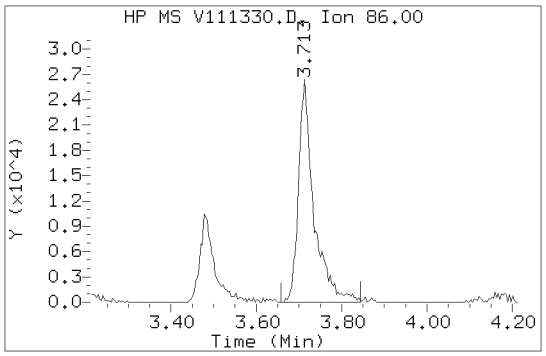


right solutions.
right partner.

Raw Data VOA10 421783

Volatiles by by EPA 8260

Workorder

HS22110553

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

11/29/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111401.D Page 1
Report Date: 14-Nov-2022 11:23

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111401.D
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 14-NOV-2022 10:39
Operator : PC Inst ID: voa10.i
Smp Info : BFB;BFB;3;;BFB
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\bfb.m
Meth Date : 27-Sep-2022 15:19 Linh.Pham Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 4.14 Sample Matrix: WATER
Processing Host: NAHSTW7051

Concentration Formula: Amt * DF * Uf * Vf * Vi * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	2.000	Injection Volume
Cpnd Variable		Local Compound Variable

					CONCENTRATIONS ON-COL (ug/L)	FINAL (ug/l)		
RT	EXP RT	REL RT	MASS	RESPONSE			TARGET RANGE	RATIO
1 bfb							CAS #: 460-00-4	
9.272	9.276	(0.000)	95	130784			0.00- 100.00	100.00
9.272	9.276	(0.000)	50	28304			15.00- 40.00	21.64
9.272	9.276	(0.000)	75	62616			30.00- 60.00	47.88
9.272	9.276	(0.000)	96	10127			5.00- 9.00	7.74
9.272	9.276	(0.000)	173	0	0.0	0.0	0.00- 2.00	0.00
9.272	9.276	(0.000)	174	121176			50.00- 0.00	92.65
9.272	9.276	(0.000)	175	9886			5.00- 9.00	8.16
9.272	9.276	(0.000)	176	116552			95.00- 101.00	96.18
9.272	9.276	(0.000)	177	8222			5.00- 9.00	7.05

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	21.64
75	30.00 - 60.00% of mass 95	47.88
96	5.00 - 9.00% of mass 95	7.74
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	92.65
175	5.00 - 9.00% of mass 174	7.56 (8.16)
176	95.00 - 101.00% of mass 174	89.12 (96.18)
177	5.00 - 9.00% of mass 176	6.29 (7.05)

Data File: V111401.D
Spectrum: Scan 2316 (9.27)
Location of Maximum: 95.10
Number of points: 97

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.20	256	60.00	1006	88.00	5663	130.10	606
36.00	1427	61.10	6814	90.90	823	130.80	154
37.10	8448	62.00	6263	92.10	3144	134.80	258
38.10	5857	63.00	5164	93.10	5201	137.00	327
39.10	4152	64.10	582	94.10	16239	138.70	452
40.00	655	65.90	370	95.10	130784	141.00	1751
41.00	1358	66.70	182	96.10	10127	141.90	829
42.00	1837	67.20	623	97.10	205	142.70	866
43.00	1228	68.10	14023	98.10	1054	143.10	1015
44.10	903	69.00	13701	103.80	626	148.20	187
45.10	2064	70.10	1659	105.00	384	149.70	155
46.20	327	71.00	278	106.00	461	152.90	173
47.30	2058	72.10	621	107.00	438	155.00	461
48.10	926	73.10	5779	109.00	239	157.00	218
49.10	6722	74.10	21024	110.90	260	160.70	264
50.10	28304	75.10	62616	112.10	260	171.50	670
51.10	7765	76.10	5665	114.60	417	172.00	634
52.10	912	76.90	901	115.20	165	174.00	121176
53.00	212	78.10	615	116.00	376	175.00	9886
54.10	203	78.90	3488	116.90	934	176.00	116552
55.00	2970	79.90	1054	117.90	553	177.00	8222
56.10	3482	80.90	3699	118.90	864	177.90	538
57.10	3417	82.00	1011	126.80	340		
58.10	443	82.90	513	127.80	644		
59.00	582	87.10	5782	128.80	234		

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111401.D

Date : 14-NOV-2022 10:39

Client ID: BFB

Instrument: voa10.i

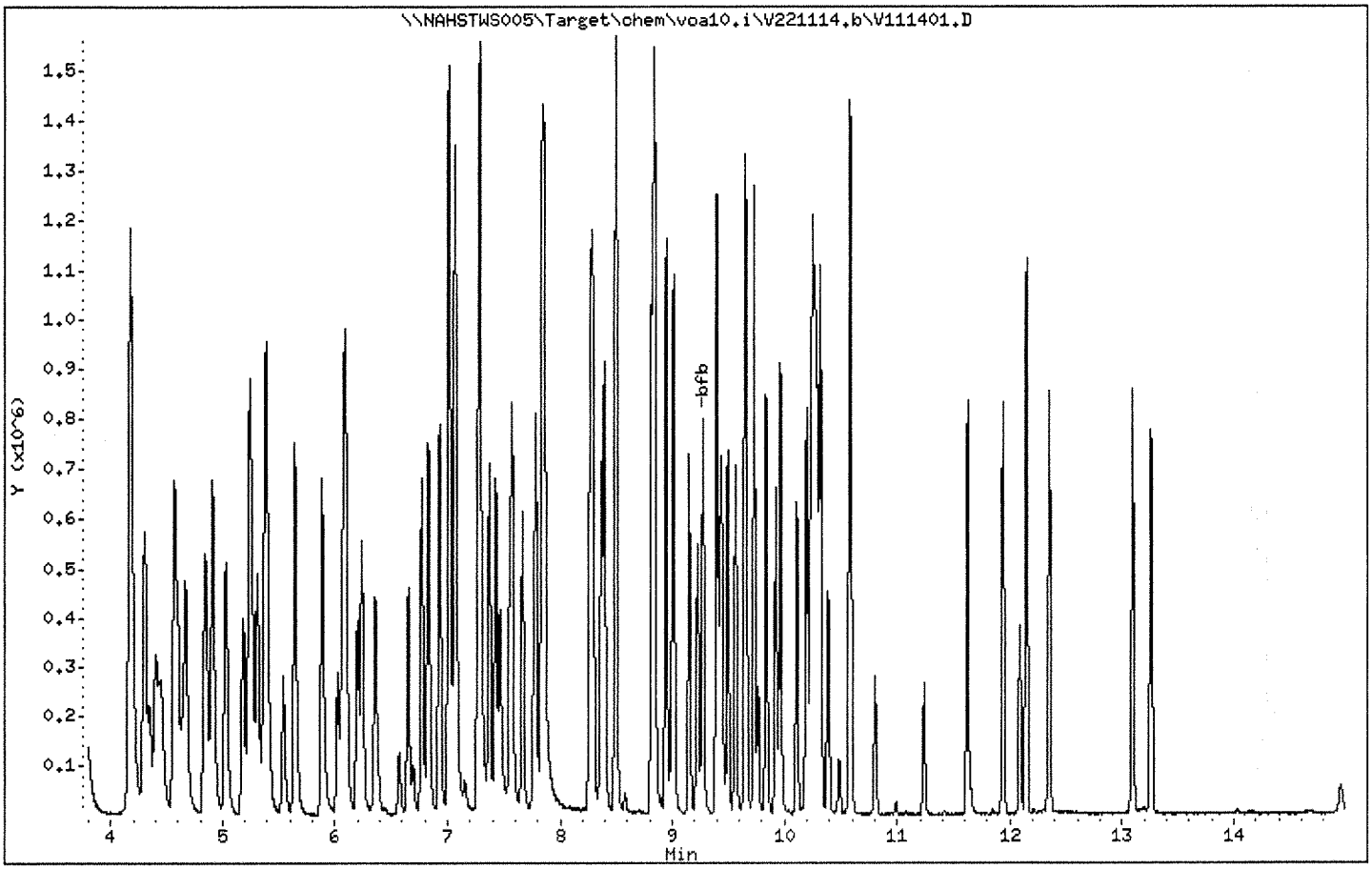
Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111401.D

Date : 14-NOV-2022 10:39

Client ID: BFB

Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

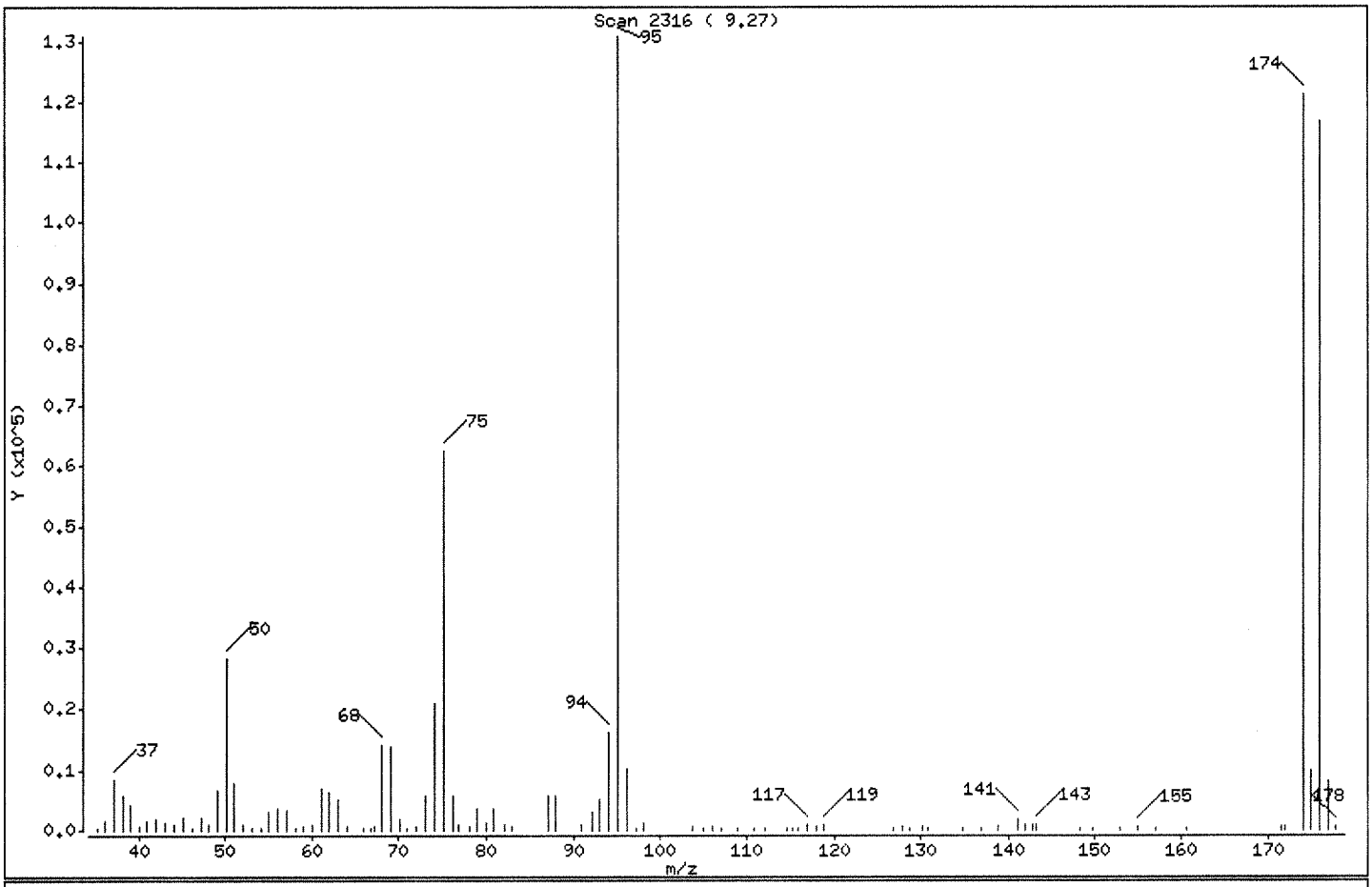
Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	21.64
75	30.00 - 60.00% of mass 95	47.88
96	5.00 - 9.00% of mass 95	7.74
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	92.65
175	5.00 - 9.00% of mass 174	7.56 (8.16)
176	95.00 - 101.00% of mass 174	89.12 (96.18)
177	5.00 - 9.00% of mass 176	6.29 (7.05)

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111401.D

Date : 14-NOV-2022 10:39

Client ID: BFB

Instrument: voa10.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0

Operator: PC

Column phase: DB624

Column diameter: 0.25

Data File: V111401.D
Spectrum: Scan 2316 (9.27)
Location of Maximum: 95.10
Number of points: 97

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.20	256	60.00	1006	88.00	5663	130.10	606
36.00	1427	61.10	6814	90.90	823	130.80	154
37.10	8448	62.00	6263	92.10	3144	134.80	258
38.10	5857	63.00	5164	93.10	5201	137.00	327
39.10	4152	64.10	582	94.10	16239	138.70	452
40.00	655	65.90	370	95.10	130784	141.00	1751
41.00	1358	66.70	182	96.10	10127	141.90	829
42.00	1837	67.20	623	97.10	205	142.70	866
43.00	1228	68.10	14023	98.10	1054	143.10	1015
44.10	903	69.00	13701	103.80	626	148.20	187
45.10	2064	70.10	1659	105.00	384	149.70	155
46.20	327	71.00	278	106.00	461	152.90	173
47.30	2058	72.10	621	107.00	438	155.00	461
48.10	926	73.10	5779	109.00	239	157.00	218
49.10	6722	74.10	21024	110.90	260	160.70	264
50.10	28304	75.10	62616	112.10	260	171.50	670
51.10	7765	76.10	5665	114.60	417	172.00	634
52.10	912	76.90	901	115.20	165	174.00	121176
53.00	212	78.10	615	116.00	376	175.00	9886
54.10	203	78.90	3488	116.90	934	176.00	116552
55.00	2970	79.90	1054	117.90	553	177.00	8222
56.10	3482	80.90	3699	118.90	864	177.90	538
57.10	3417	82.00	1011	126.80	340		
58.10	443	82.90	513	127.80	644		
59.00	582	87.10	5782	128.80	234		

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111403.D Page 1
Report Date: 29-Nov-2022 14:30

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111403.D
Lab Smp Id: VSTD050 Client Smp ID: VSTD050
Inj Date : 14-NOV-2022 11:20
Operator : PC Inst ID: voa10.i
Smp Info : VSTD050;VSTD050;2;;
Misc Info : V10;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\8260C.m
Meth Date : 29-Nov-2022 14:30 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 3 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.916	4.916	(1.000)	528961	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.250)	217460	50.0000	48.01
3	Chloromethane	50	1.374	1.374	(0.279)	237358	50.0000	48.01
5	Vinyl Chloride	62	1.452	1.452	(0.295)	241914	50.0000	49.27
6	Bromomethane	94	1.703	1.703	(0.347)	114374	50.0000	51.61
7	Chloroethane	64	1.786	1.786	(0.363)	151376	50.0000	53.53
8	Trichlorofluoromethane	101	1.992	1.992	(0.405)	306235	50.0000	47.47
9	Acrolein	56	2.352	2.352	(0.478)	19750	100.000	92.42
10	Acetone	43	2.494	2.494	(0.507)	178874	100.000	81.65
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	187382	50.0000	56.90
15	Iodomethane	142	2.573	2.573	(0.523)	400940	100.000	96.26
16	Acrylonitrile	53	3.143	3.143	(0.639)	165916	100.000	85.04
17	Methylene Chloride	84	2.899	2.899	(0.590)	203971	50.0000	59.21
18	Methyl tert-butyl ether	73	3.195	3.195	(0.650)	632587	50.0000	46.81
19	Carbon Disulfide	76	2.633	2.633	(0.536)	1037440	100.000	111.63
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	176507	50.0000	43.62
21	Vinyl Acetate	43	3.713	3.713	(0.755)	1275170	100.000	118.86(M)
22	1,1-Dichloroethane	63	3.630	3.630	(0.738)	401552	50.0000	54.00
24	2-Butanone	43	4.350	4.350	(0.885)	274404	100.000	100.04
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	317760	50.0000	49.63

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.876)	234909	50.0000	48.84
28 Chloroform	83	4.669	4.669 (0.950)	393874	50.0000	45.32

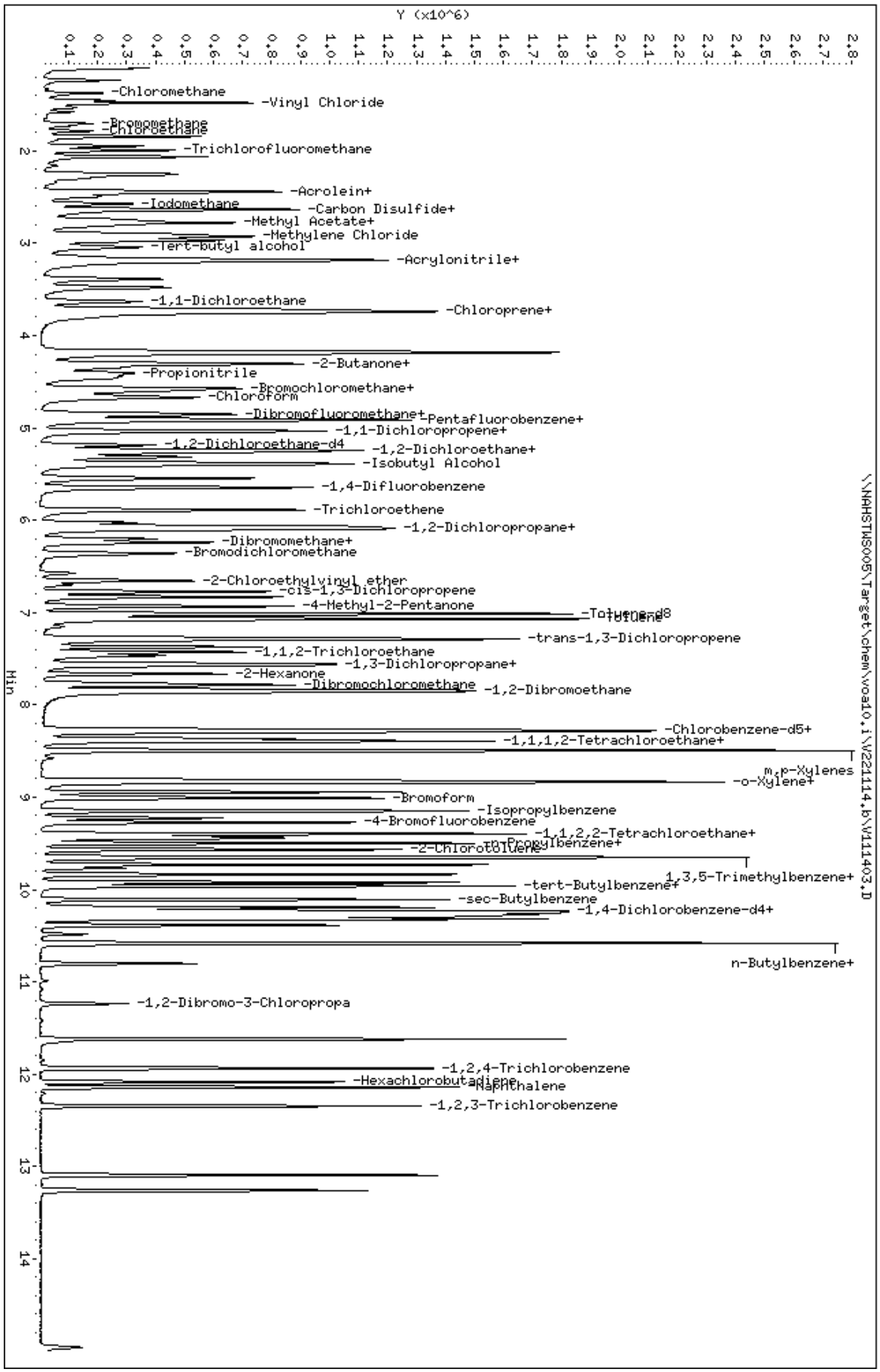
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.567	4.567	(0.929)	115832	50.0000	48.14
$	30 Dibromofluoromethane	113	4.841	4.841	(0.985)	222932	50.0000	49.88
	31 1,1,1-Trichloroethane	97	4.856	4.856	(0.988)	317260	50.0000	45.44
	32 1,1-Dichloropropene	75	5.036	5.036	(0.892)	296222	50.0000	48.34
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	331445	50.0000	45.10
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	250277	50.0000	47.20
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	276093	50.0000	48.64
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	795146	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	941917	50.0000	46.53
	38 Trichloroethene	130	5.891	5.891	(1.044)	240086	50.0000	46.34
	39 Bromodichloromethane	83	6.359	6.359	(1.127)	286426	50.0000	45.36
	41 2-Chloroethylvinyl ether	63	6.655	6.655	(1.179)	206283	100.000	96.11
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	267147	50.0000	47.23
	44 Dibromomethane	93	6.198	6.198	(1.098)	137682	50.0000	42.52
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	561684	100.000	98.03
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.200)	408602	50.0000	48.42
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	628182	50.0000	
$	48 Toluene-d8	98	7.011	7.011	(0.848)	874045	50.0000	55.17
	50 Toluene	91	7.071	7.071	(0.855)	949837	50.0000	51.30
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	338272	50.0000	45.61
	52 2-Hexanone	43	7.664	7.664	(0.927)	385022	100.000	94.81
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	176356	50.0000	47.59
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	369632	50.0000	48.56
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	223057	50.0000	46.13
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	193918	50.0000	50.45
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	213454	50.0000	47.05
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	206120	50.0000	47.08
	59 Chlorobenzene	112	8.293	8.293	(1.003)	554506	50.0000	43.88
	60 1,1,1,2-Tetrachloroethane	131	8.368	8.368	(1.012)	211290	50.0000	46.66
	61 Ethylbenzene	106	8.391	8.391	(1.015)	291989	50.0000	47.17
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	705567	100.000	92.59
	63 o-Xylene	106	8.833	8.833	(1.068)	340673	50.0000	44.76
	64 Styrene	104	8.845	8.845	(1.070)	608351	50.0000	44.01
	66 Bromoform	173	8.991	8.991	(1.088)	162426	50.0000	44.48
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	833731	50.0000	44.14
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	298586	50.0000	48.11
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	295913	50.0000	47.39
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	378108	50.0000	
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	341717	50.0000	42.51
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	987849	50.0000	47.89
	74 Bromobenzene	156	9.399	9.399	(0.917)	261921	50.0000	45.38
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	725036	50.0000	47.07
	76 2-Chlorotoluene	91	9.564	9.564	(0.933)	619390	50.0000	46.79
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	743678	50.0000	46.17
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	591519	50.0000	44.52
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	754482	50.0000	45.07
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	828748	50.0000	44.38
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	778138	50.0000	45.81
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	492372	50.0000	42.63
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	516941	50.0000	47.20
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	748299	50.0000	45.94
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	502647	50.0000	47.67

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	55538	50.0000	47.51
90	1,2,4-Trichlorobenzene	180	11.933	11.933 (1.164)	388416	50.0000	48.51

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	178092	50.0000	55.13
	92 Naphthalene	128	12.143	12.143	(1.185)	962837	50.0000	45.27
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	357419	50.0000	48.35
M	94 1,2-Dichloroethylene (total)	96				411416	100.000	(a)
	135 1,4-Dioxane	88	6.247	6.247	(1.271)	49708	1000.00	782.97
	141 Cyclohexane	56	4.912	4.912	(0.999)	315446	50.0000	61.98
	138 Freon TF	101	2.449	2.449	(0.498)	186257	50.0000	63.30
	147 Methylcyclohexane	55	6.071	6.071	(1.076)	340800	50.0000	46.77
	146 Methyl Acetate	43	2.809	2.809	(0.571)	232283	50.0000	53.60
	148 Tert-Butyl alcohol	59	3.042	3.042	(0.619)	467890	1000.00	706.11
	149 Isopropyl Alcohol	45	2.637	2.637	(0.536)	352384	1000.00	753.95
	72 trans-1,4-Dichloro-2-butene	53	9.448	9.448	(1.143)	95829	50.0000	41.79
	12 Isobutyl Alcohol	43	5.373	5.373	(1.093)	813132	1000.00	985.89
	13 Acetonitrile	39	2.775	2.775	(0.565)	362194	500.000	489.50
	14 Allyl Chloride	41	2.775	2.775	(0.565)	784882	50.0000	69.42
	25 Methacrylonitrile	41	4.575	4.575	(0.931)	225041	50.0000	51.05
	40 Methyl Methacrylate	41	6.239	6.239	(1.269)	260483	50.0000	49.37
	4 Propionitrile	54	4.406	4.406	(0.896)	379911	500.000	493.88
	23 Chloroprene	53	3.739	3.739	(0.761)	355160	50.0000	54.40
	49 Ethyl Methacrylate	69	6.239	6.239	(1.106)	173974	50.0000	51.13

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.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Min
1 2 3 4 5 6 7 8 9 10 11 12 13 14
-Chloromethane
-Vinyl Chloride
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-Acrolein+
-Iodomethane
-Carbon Disulfide+
-Methyl Acetate+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-1,1-Dichloroethane
-Chloroprene+
-2-Butanone+
-Propionitrile
-Bromochloromethane+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane-d4
-1,2-Dichloroethane+
-Isobutyl Alcohol
-1,4-Difluorobenzene
-Trichloroethene
-1,2-Dichloropropane+
-Dibromomethane+
-Bromodichloromethane
-2-Chloroethylvinyl ether
-cis-1,3-Dichloropropene
-4-Methyl-2-Pentanone
-Toluene-d8
Toluene
-trans-1,3-Dichloropropene
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
m,p-Xylenes
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-Propylbenzene+
-2-Chlorotoluene
1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
-1,4-Dichlorobenzene-d4+
n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
Naphthalene
-1,2,3-Trichlorobenzene
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Sample Info: VSTD050;VSTD050;2;;
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10,i
Operator: PC
Column diameter: 0.18
Page 1

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111403.D
Inj Date : 14-NOV-2022 11:20
InstruID : voa10.i
LabSampID : VSTD050

Vinyl Acetate (108-05-4)

Reason Code:

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14:29
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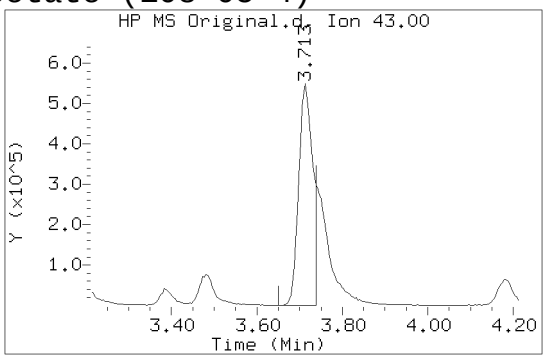

AFTER

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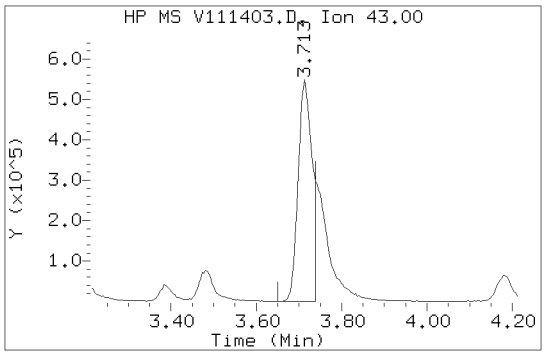

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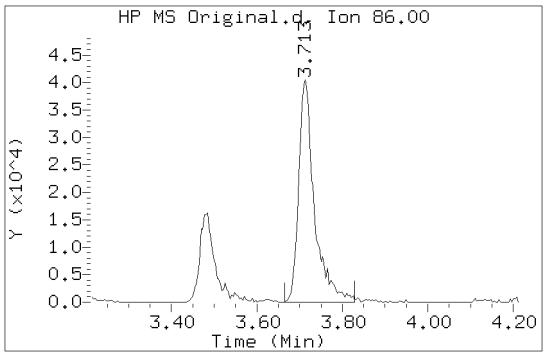

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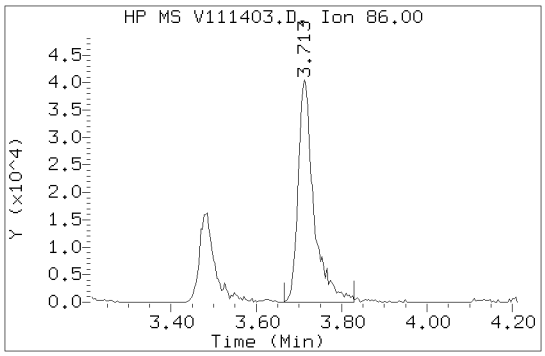

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Report Date: 14-Nov-2022 21:27

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111404.D
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Inj Date : 14-NOV-2022 11:40
Operator : PC Inst ID: voa10.i
Smp Info : CCB;CCB
Misc Info : V10;WATER;0;1;
Comment   :
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Meth Date : 14-Nov-2022 14:27 Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTWS005

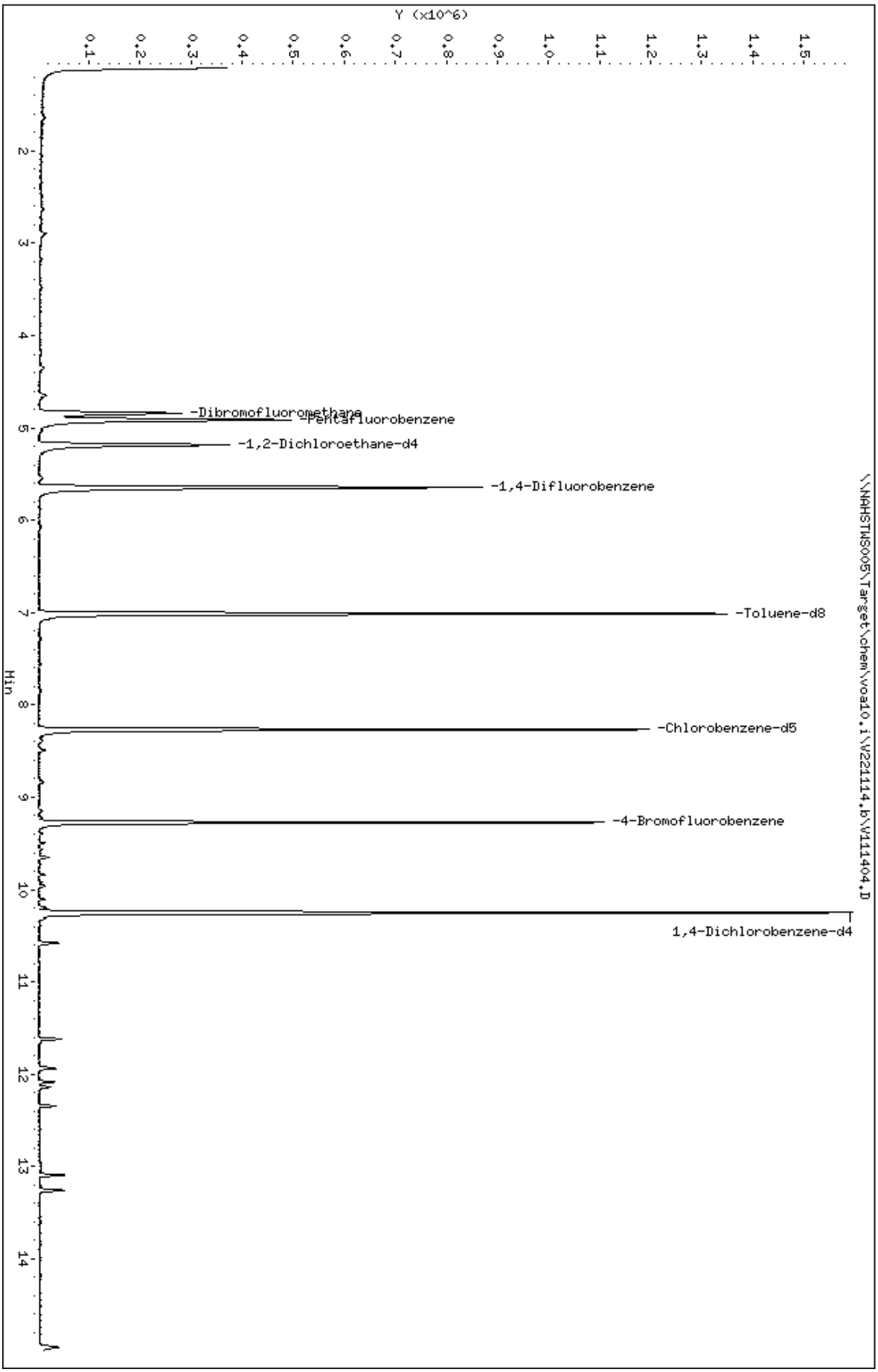
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	392534	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.841	(0.985)	185815	56.0271	56.02
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	283087	67.2124	67.21(R)
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	717826	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	606278	50.0000	
$ 48 Toluene-d8	98	7.012	7.011	(0.848)	815699	53.3647	53.36
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	305017	50.5534	50.55
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	384988	50.0000	

QC Flag Legend

R - Spike/Surrogate failed recovery limits.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Client ID: CCB
Sample Info: CCB;CCB
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10.i
Operator: PC
Column diameter: 0.18
Page 1
Y (x10^6)
Min
-Dibromofluoromethane
-Pentafluorobenzene
-1,2-Dichloroethane-d4
-1,4-Difluorobenzene
-Toluene-d8
-Chlorobenzene-d5
-4-Bromofluorobenzene
1,4-Dichlorobenzene-d4
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Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111405.D Page 1
Report Date: 29-Nov-2022 14:30

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111405.D
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Operator : PC Inst ID: voa10.i
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Misc Info : V10;WATER;0;1;
Comment :
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Meth Date : 29-Nov-2022 14:30 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 5 QC Sample: LCS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1	Pentafluorobenzene	168	4.912	4.916	(1.000)	466568	50.0000	
2	Dichlorodifluoromethane	85	1.235	1.231	(0.251)	94765	23.7221	23.72
3	Chloromethane	50	1.370	1.374	(0.279)	101487	23.2763	23.27
5	Vinyl Chloride	62	1.452	1.452	(0.296)	97377	22.4884	22.48
6	Bromomethane	94	1.707	1.703	(0.348)	49237	25.1932	25.19
7	Chloroethane	64	1.786	1.786	(0.364)	56725	22.7433	22.74
8	Trichlorofluoromethane	101	1.992	1.992	(0.406)	135591	23.8294	23.82
9	Acrolein	56	2.344	2.352	(0.477)	8389	43.8845	43.88
10	Acetone	43	2.491	2.494	(0.507)	62256	28.9242	28.92
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	66068	24.1784	24.17(M)
15	Iodomethane	142	2.569	2.573	(0.523)	129983	38.7966	38.79
16	Acrylonitrile	53	3.143	3.143	(0.640)	78155	45.4191	45.41
17	Methylene Chloride	84	2.895	2.899	(0.589)	86914	27.6482	27.64
18	Methyl tert-butyl ether	73	3.192	3.195	(0.650)	266759	22.3810	22.38
19	Carbon Disulfide	76	2.629	2.633	(0.535)	469000	58.2794	58.27
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.646)	83412	23.3722	23.37
21	Vinyl Acetate	43	3.709	3.713	(0.755)	359078	37.9467	37.94(M)
22	1,1-Dichloroethane	63	3.630	3.630	(0.739)	133615	20.7318	20.73
24	2-Butanone	43	4.346	4.350	(0.885)	107405	44.3934	44.39
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	131677	23.3175	23.31

27 cis-1,2-Dichloroethene	96	4.305	4.309 (0.876)	98845	23.3022	23.30
28 Chloroform	83	4.672	4.669 (0.951)	161767	21.1050	21.10

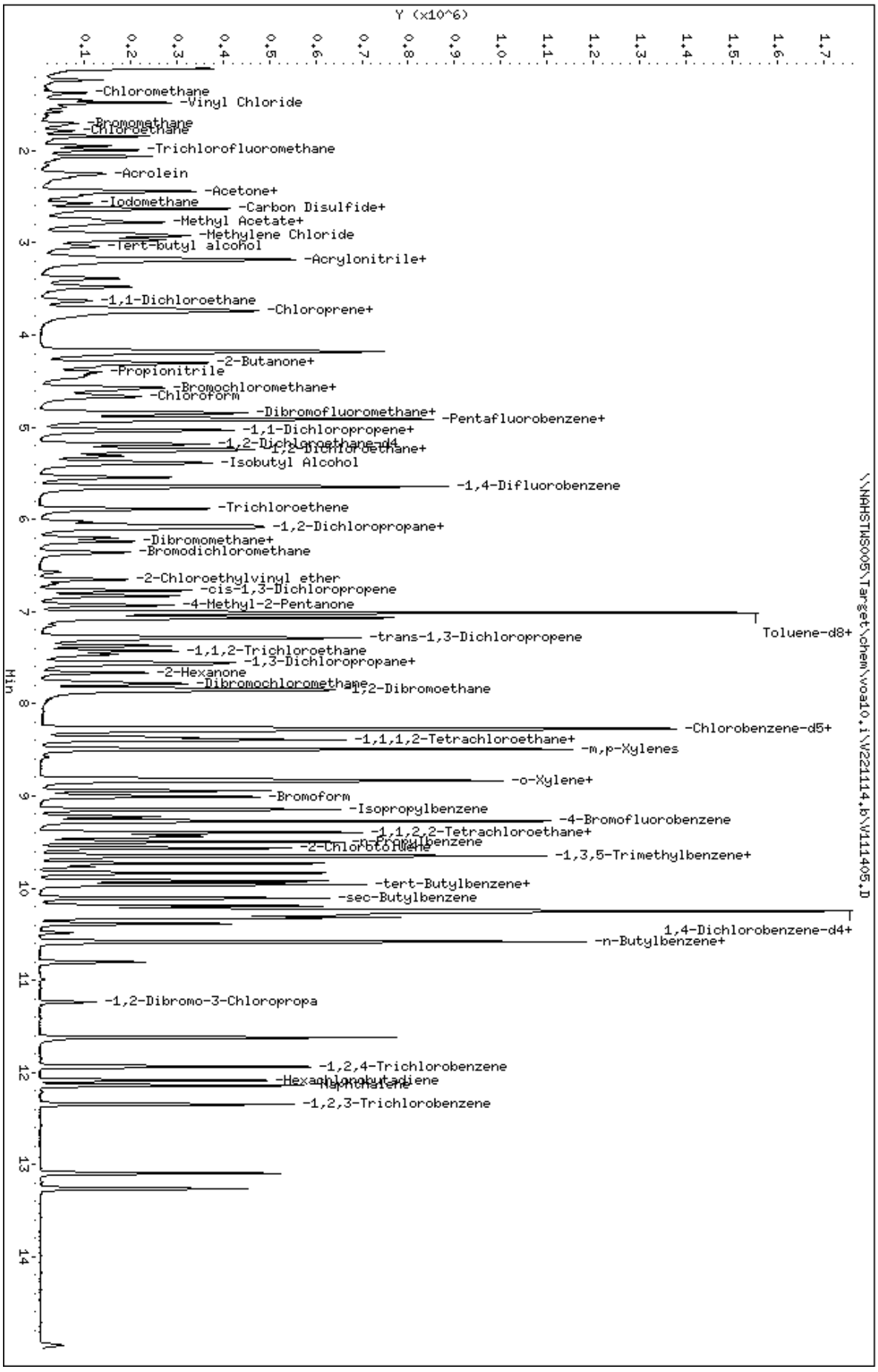
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	29 Bromochloromethane	128	4.567	4.567	(0.930)	48087	22.6580	22.65
$	30 Dibromofluoromethane	113	4.841	4.841	(0.986)	217711	55.2281	55.22
	31 1,1,1-Trichloroethane	97	4.856	4.856	(0.989)	139246	22.6118	22.61
	32 1,1-Dichloropropene	75	5.032	5.036	(0.892)	131066	22.9058	22.90
	33 1,2-Dichloroethane	62	5.261	5.265	(0.932)	139122	20.2758	20.27
	34 Carbon Tetrachloride	117	5.028	5.032	(0.891)	110728	22.3658	22.36
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	282475	56.4251	56.42
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	742505	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	392669	20.7745	20.77
	38 Trichloroethene	130	5.883	5.891	(1.043)	102011	21.0892	21.08
	39 Bromodichloromethane	83	6.355	6.359	(1.126)	120155	20.3792	20.37
	41 2-Chloroethylvinyl ether	63	6.652	6.655	(1.179)	73661	36.7564	36.75
	42 1,2-Dichloropropane	63	6.093	6.097	(1.080)	109325	20.7000	20.70
	44 Dibromomethane	93	6.198	6.198	(1.098)	57735	19.0957	19.09
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	192254	36.5316	36.53
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.200)	164789	20.9127	20.91
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	608026	50.0000	
$	48 Toluene-d8	98	7.011	7.011	(0.848)	829084	54.0807	54.08
	50 Toluene	91	7.068	7.071	(0.855)	383494	21.3993	21.39
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	132184	19.0895	19.08
	52 2-Hexanone	43	7.664	7.664	(0.927)	143873	37.6598	37.65
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	71778	20.0145	20.01
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	150235	20.3932	20.39
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	90167	19.2681	19.26
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	81953	22.0321	22.03
	57 1,2-Dibromoethane	107	7.859	7.862	(0.951)	85927	19.5708	19.57
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	87249	21.3442	21.34
	59 Chlorobenzene	112	8.293	8.293	(1.003)	232929	19.0442	19.04
	60 1,1,1,2-Tetrachloroethane	131	8.361	8.368	(1.011)	84831	19.3576	19.35
	61 Ethylbenzene	106	8.391	8.391	(1.015)	120377	20.0935	20.09
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	298648	40.4920	40.49
	63 o-Xylene	106	8.830	8.833	(1.068)	141507	19.2095	19.20
	64 Styrene	104	8.841	8.845	(1.069)	257682	19.2597	19.25
	66 Bromoform	173	8.991	8.991	(1.088)	63540	18.6707	18.67
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	352338	19.2760	19.27
	68 1,1,2,2-Tetrachloroethane	83	9.399	9.396	(0.917)	123873	19.2350	19.23
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	293969	48.6189	48.61
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	390264	50.0000	
	71 1,2,3-Trichloropropane	75	9.437	9.433	(0.921)	142792	17.2123	17.21
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	421635	19.8064	19.80
	74 Bromobenzene	156	9.399	9.399	(0.917)	112965	18.9655	18.96
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	312444	19.6543	19.65
	76 2-Chlorotoluene	91	9.564	9.564	(0.933)	269488	20.5399	20.53
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	320870	19.3033	19.30
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	262038	19.1111	19.11
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	331425	19.1855	19.18
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	374822	19.4492	19.44
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	343226	19.5793	19.57
	83 1,3-Dichlorobenzene	146	10.194	10.198	(0.995)	218058	18.2948	18.29
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	223871	20.1411	20.14
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	331003	19.6917	19.69
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	218154	20.0432	20.04

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	21033	17.4334	17.43
90	1,2,4-Trichlorobenzene	180	11.933	11.933 (1.164)	161780	19.6067	19.60

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	91 Hexachlorobutadiene	225	12.083	12.083	(1.179)	86104	27.4603	27.46
	92 Naphthalene	128	12.143	12.143	(1.185)	377976	17.2196	17.21
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	151939	19.7623	19.76
M	94 1,2-Dichloroethylene (total)	96				182257	46.6745	46.67
M	95 Xylenes (total)	106				440155	59.7016	59.70
	135 1,4-Dioxane	88	6.243	6.247	(1.271)	21632	393.326	393.32
	141 Cyclohexane	56	4.912	4.912	(1.000)	142558	34.9268	34.92(M)
	138 Freon TF	101	2.449	2.449	(0.499)	70285	30.0400	30.04(M)
	147 Methylcyclohexane	55	6.067	6.071	(1.075)	147811	21.7243	21.72
	146 Methyl Acetate	43	2.805	2.809	(0.571)	83220	21.7729	21.77
	148 Tert-Butyl alcohol	59	3.038	3.042	(0.618)	157150	268.877	268.87
	149 Isopropyl Alcohol	45	2.633	2.637	(0.536)	129952	315.225	315.22
	72 trans-1,4-Dichloro-2-butene	53	9.444	9.448	(1.142)	39534	17.8123	17.81
	12 Isobutyl Alcohol	43	5.377	5.373	(1.095)	270134	371.329	371.32
	13 Acetonitrile	39	2.775	2.775	(0.565)	156319	239.515	239.51
	14 Allyl Chloride	41	2.772	2.775	(0.564)	328054	32.8961	32.89
	25 Methacrylonitrile	41	4.575	4.575	(0.931)	85044	21.8754	21.87
	40 Methyl Methacrylate	41	6.239	6.239	(1.270)	88403	18.9970	18.99
	4 Propionitrile	54	4.402	4.406	(0.896)	151212	222.864	222.86(a)
	23 Chloroprene	53	3.731	3.739	(0.760)	138804	24.1050	24.10
	49 Ethyl Methacrylate	69	6.235	6.239	(1.105)	57527	18.1071	18.10

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.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1.1
1.2
1.3
1.4
1.5
1.6
1.7
Min
2
3
4
5
6
7
8
9
10
11
12
13
14
-Chloromethane
-Vinyl Chloride
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-Acrolein
-Acetone+
-Iodomethane
-Carbon Disulfide+
-Methyl Acetate+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-1,1-Dichloroethane
-Chloroprene+
-2-Butanone+
-Propionitrile
-Bromochloromethane+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane-d4
-1,2-Dichloroethane+
-Isobutyl Alcohol
-1,4-Difluorobenzene
-Trichloroethene
-1,2-Dichloropropane+
-Dibromomethane+
-Bromodichloromethane
-2-Chloroethylvinyl ether
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-4-Methyl-2-Pentanone
Toluene-d8+
-trans-1,3-Dichloropropene
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
1,2-Dibromoethane
-Chlorobenzene-d5+
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
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Sample Info: VLCSW-221114;VLCSW-221114;3;;LCS
Purge Volume: 5.0
Column phase: DB624
Instrument: voa10.i
Operator: PC
Column diameter: 0.18
Page 1

Data File : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111405.D
Inj Date : 14-NOV-2022 12:08
InstruID : voa10.i
LabSampID : VLCSW-221114

1,1-Dichloroethene (75-35-4)

Reason Code:

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29-Nov-2022
14:29
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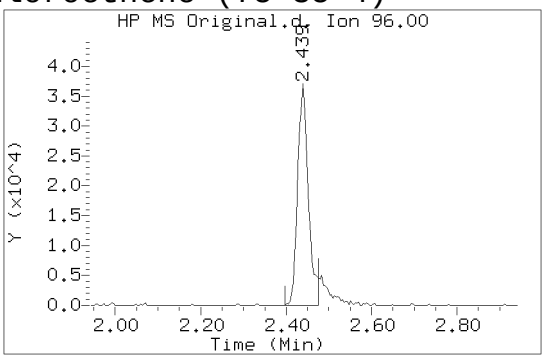

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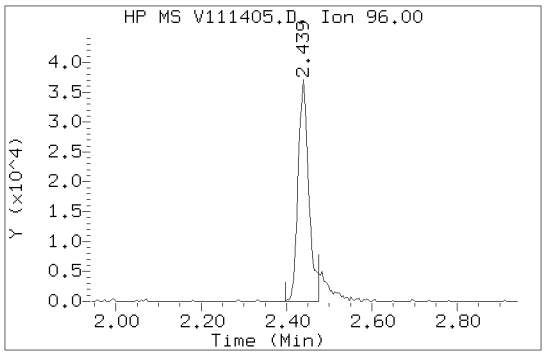

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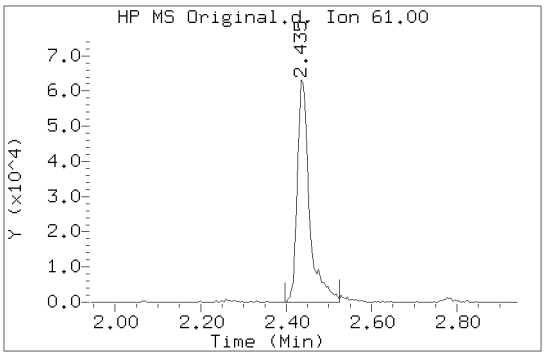

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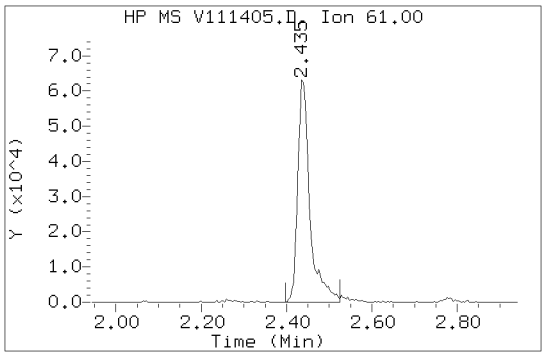

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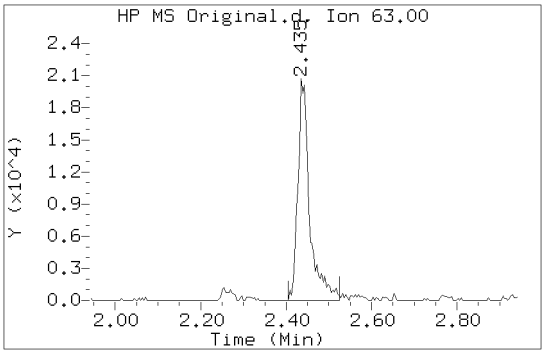

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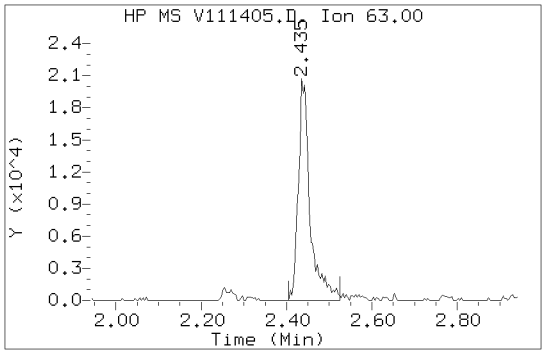

Vinyl Acetate (108-05-4)

Reason Code:

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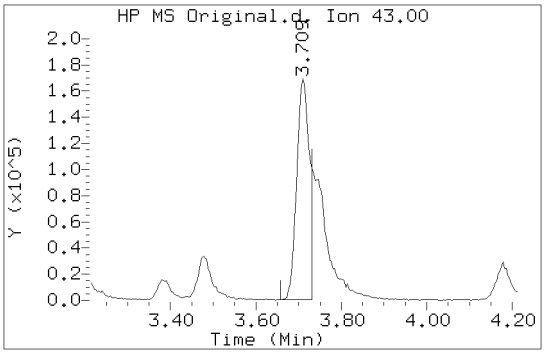

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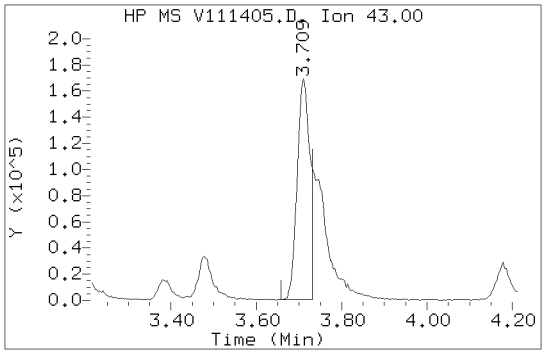

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InstruID : voa10.i
LabSampID : VLCSW-221114

Vinyl Acetate (108-05-4)

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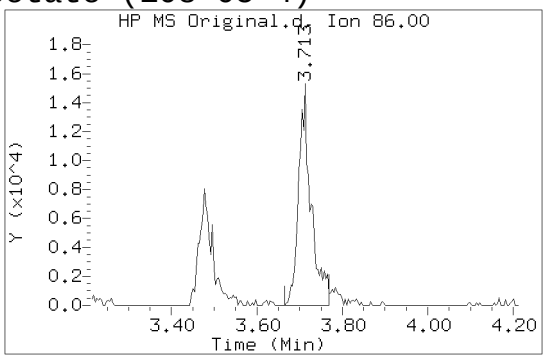

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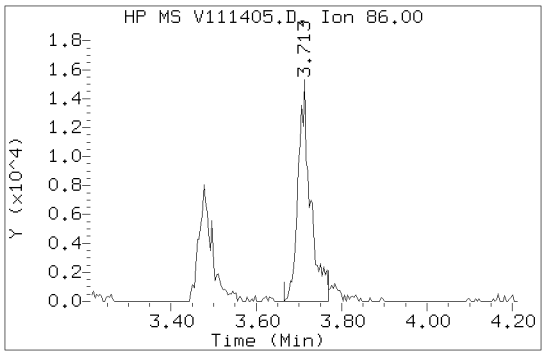

Cyclohexane (110-82-7)

Reason Code:

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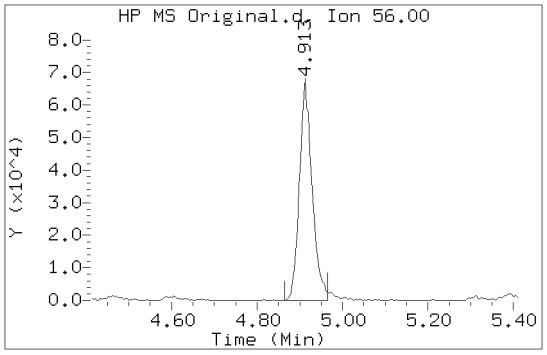

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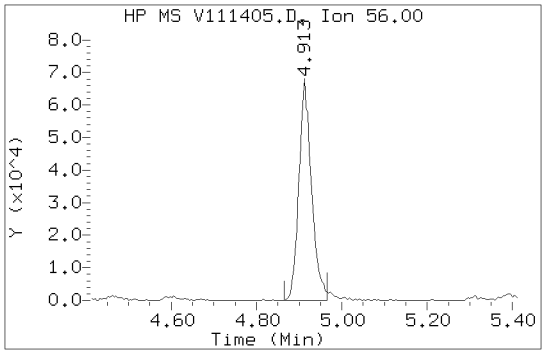

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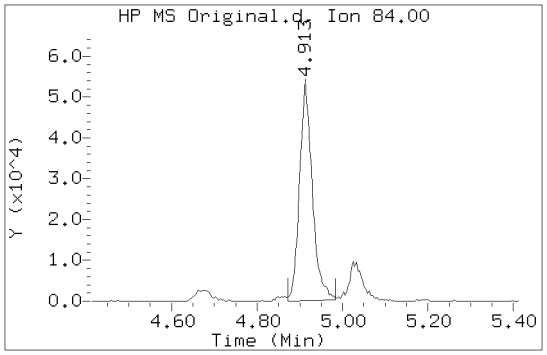

AFTER

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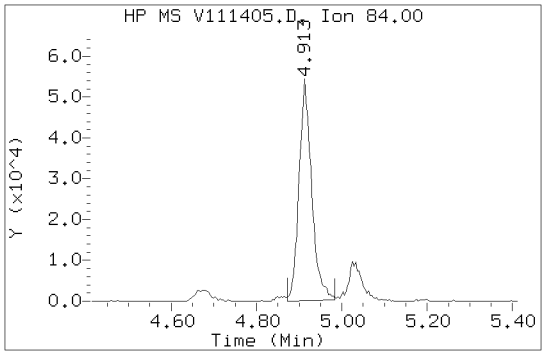

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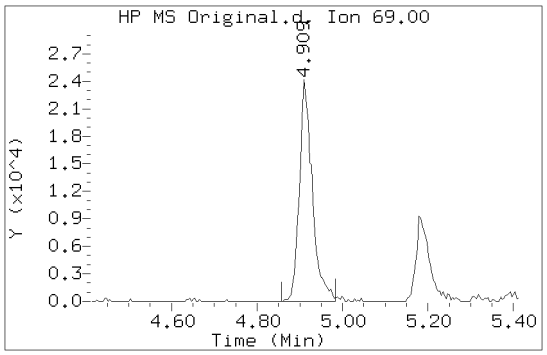

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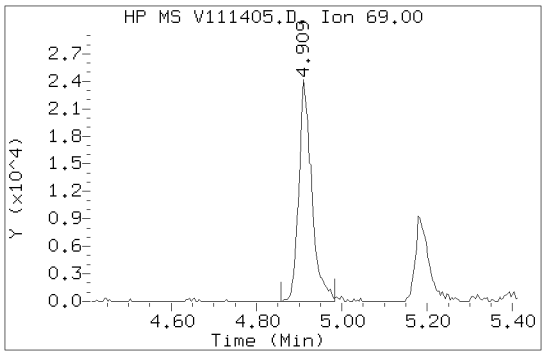

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InstruID : voa10.i
LabSampID : VLCSW-221114

Freon TF (76-13-1)

Reason Code:

BEFORE

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HEIGHT
36864
29-Nov-2022
14:29
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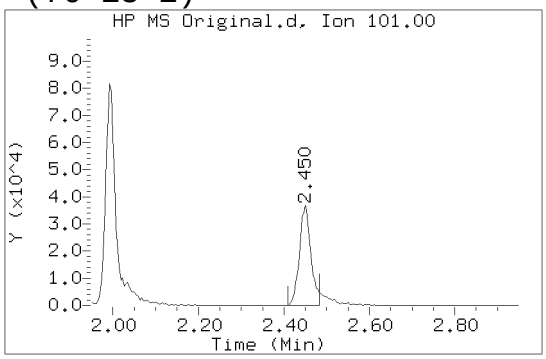

AFTER

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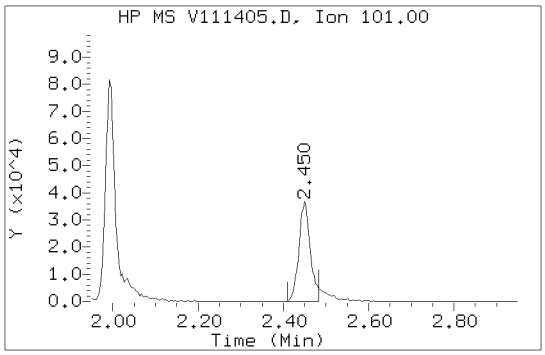

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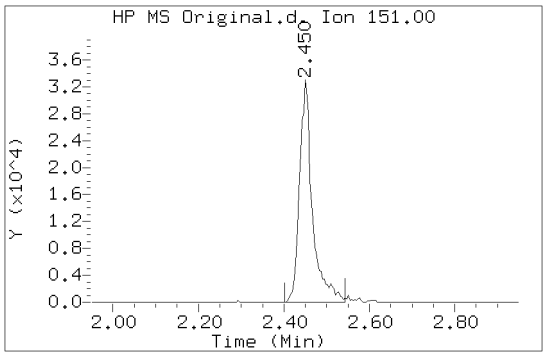

AFTER

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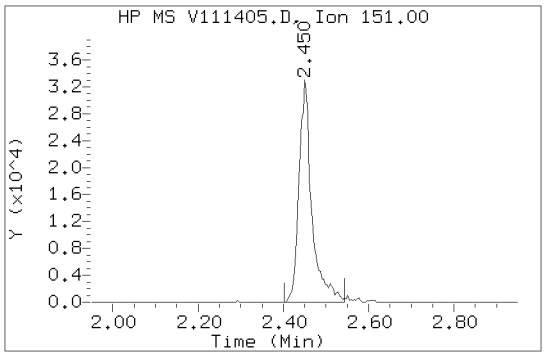

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111407.D Page 1
Report Date: 29-Nov-2022 14:30

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111407.D
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Inj Date : 14-NOV-2022 12:49
Operator : PC Inst ID: voa10.i
Smp Info : VBLKW-221114;VBLKW-221114;3;;BLANK
Misc Info : V10;WATER;0;1;
Comment :
Method : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\8260C.m
Meth Date : 29-Nov-2022 14:30 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 7 QC Sample: BLANK
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

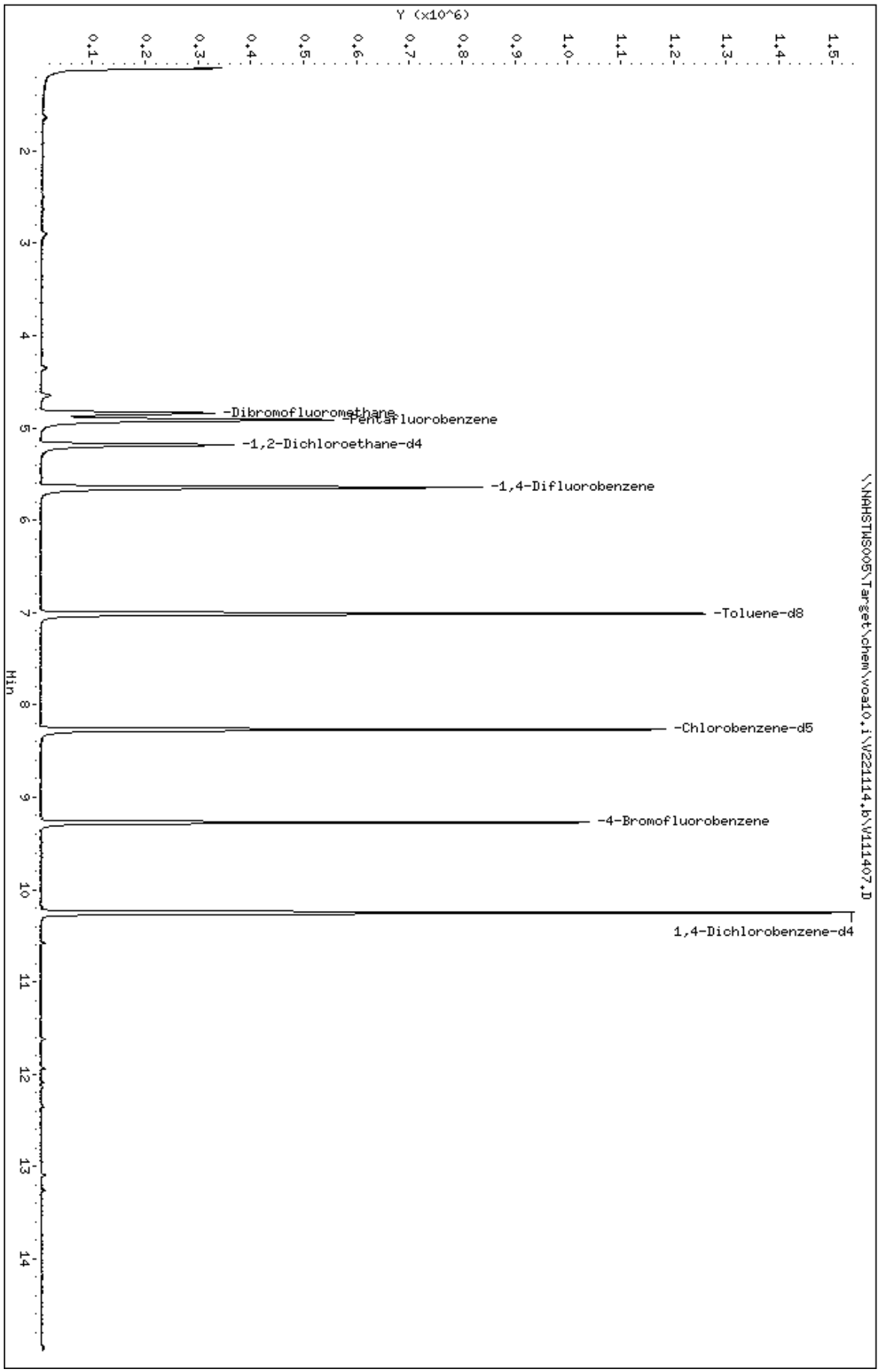
Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	450182	50.0000	
$ 30 Dibromofluoromethane	113	4.841	4.841	(0.985)	224526	59.0300	59.03(M)
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	279725	57.9096	57.90
* 36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	685634	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	583710	50.0000	
$ 48 Toluene-d8	98	7.011	7.011	(0.848)	782269	53.1574	53.15
$ 69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	285142	49.1138	49.11
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	370789	50.0000	

QC Flag Legend

M - Compound response manually integrated.

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111407.D
Date : 14-NOV-2022 12:49
Client ID: VBLKW-221114
Sample Info: VBLKW-221114;VBLKW-221114;3;;BLANK
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18



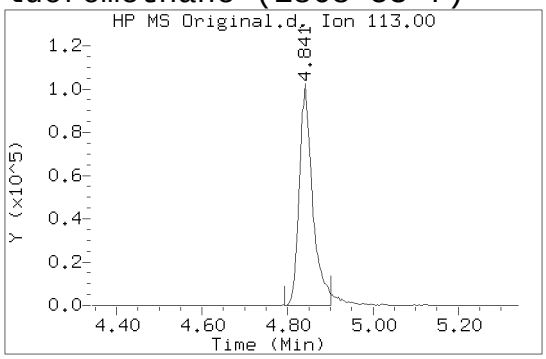
Data File : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111407.D
Inj Date : 14-NOV-2022 12:49
InstruID : voa10.i
LabSampID : VBLKW-221114

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

MASS
113
AREA
224526
HEIGHT
102480
29-Nov-2022
14:29
linh
pham



AFTER

MASS
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AREA
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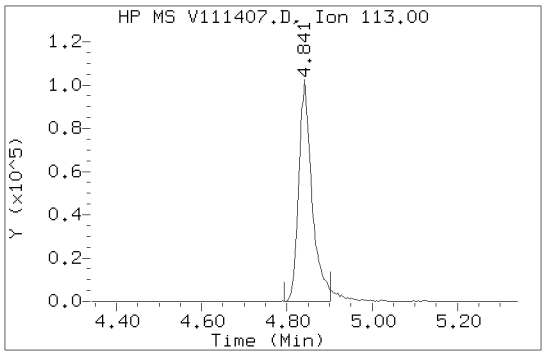
HEIGHT
102480
29-Nov-2022
14:29
linh
pham



BEFORE

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237143
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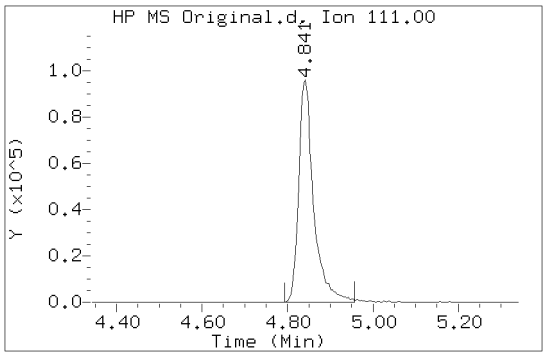
29-Nov-2022
14:29
linh
pham



AFTER

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AREA
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HEIGHT
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14:29
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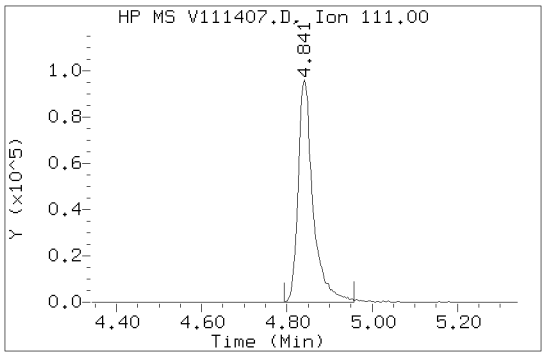


Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111408.D Page 1
Report Date: 29-Nov-2022 14:41

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111408.D
Lab Smp Id: HS22110553-06 Client Smp ID: HS22110553-06
Inj Date : 14-NOV-2022 13:10
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-06;HS22110553-06;;;
Misc Info : V10;WATER;0;10;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\8260C.m
Meth Date : 29-Nov-2022 14:41 Linh.Pham Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 8
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

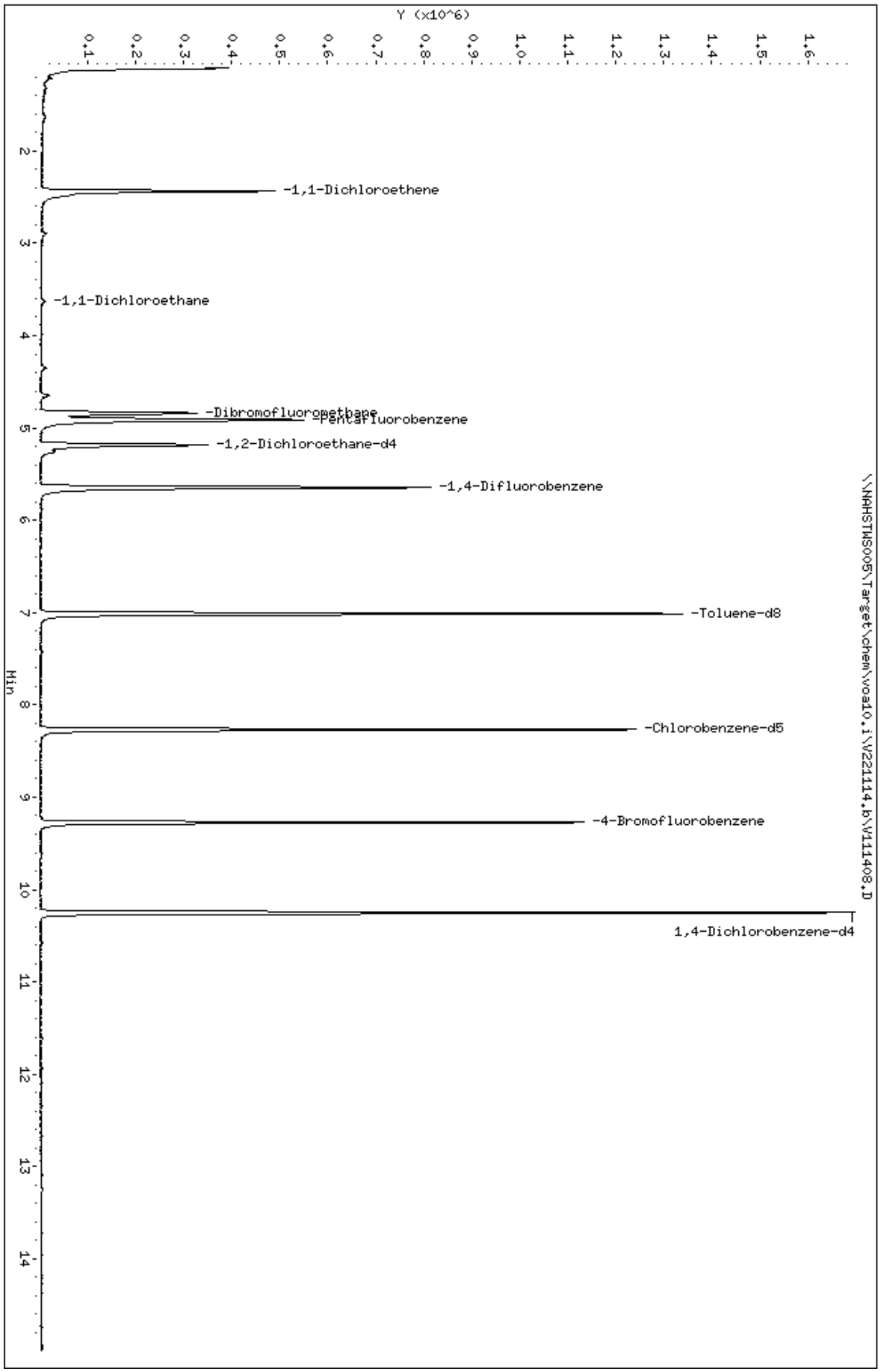
Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	455309	50.0000	
11 1,1-Dichloroethene	96	2.438	2.442	(0.496)	186905	64.4947	644.94
22 1,1-Dichloroethane	63	3.630	3.630	(0.738)	7062	0.57468	5.74(a)
$ 30 Dibromofluoromethane	113	4.837	4.841	(0.984)	226990	59.0058	59.00(M)
$ 35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	274827	56.2549	56.25
* 36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	688482	50.0000	
* 47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	621981	50.0000	
$ 48 Toluene-d8	98	7.011	7.011	(0.848)	800125	51.0364	51.03
$ 69 4-Bromofluorobenzene	95	9.272	9.276	(1.122)	308408	49.8384	49.83
* 70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	398151	50.0000	

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



Data File: \\NAHSTWS005\Target\chem\voa10,i\V221114,b\V111408,D
Date : 14-NOV-2022 13:10
Client ID: HS22110553-06
Sample Info: HS22110553-06;HS22110553-06;;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10,i
Operator: PC
Column diameter: 0.18

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111408.D

Date : 14-NOV-2022 13:10

Client ID: HS22110553-06

Instrument: voa10.i

Sample Info: HS22110553-06;HS22110553-06;;;

Purge Volume: 5.0

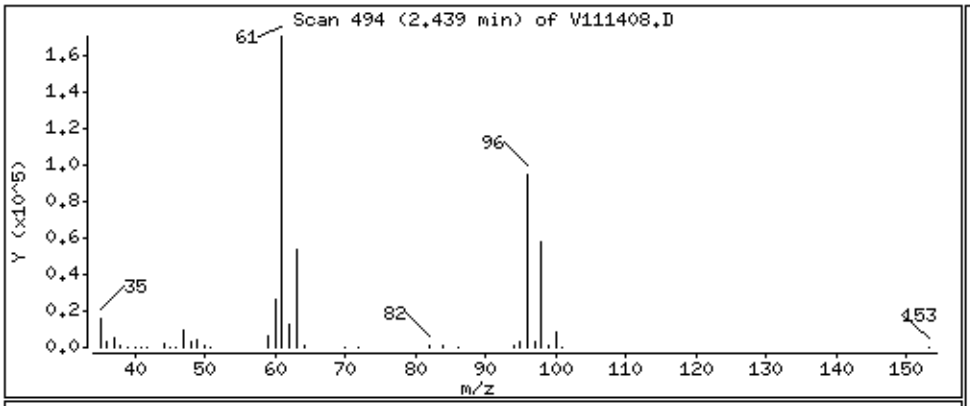
Operator: PC

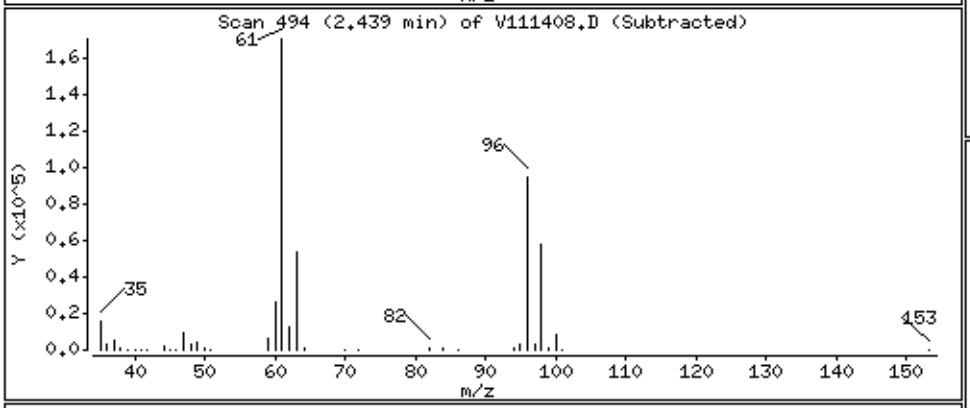
Column phase: DB624

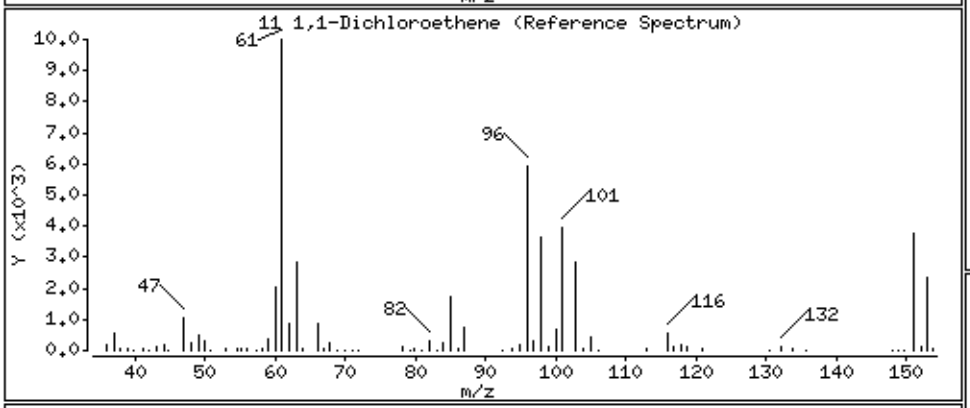
Column diameter: 0.18

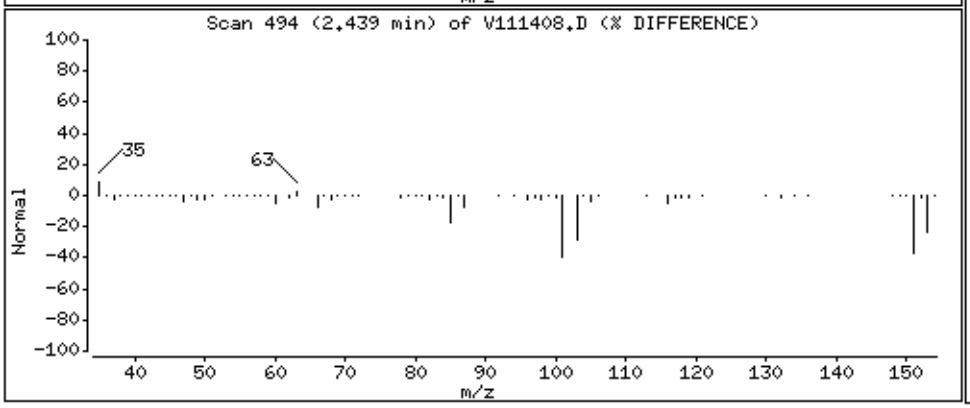
11 1,1-Dichloroethene

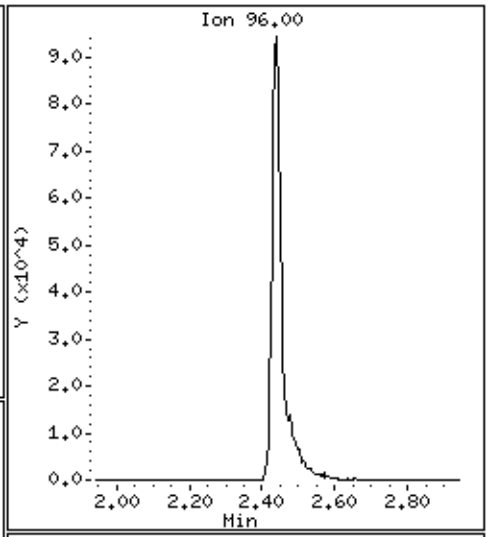
Concentration: 644.94 ug/l

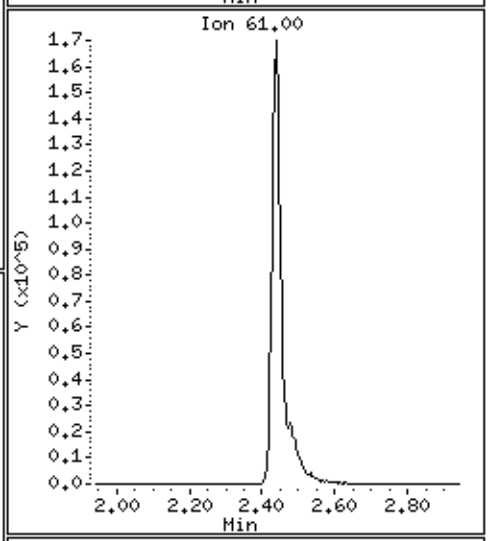


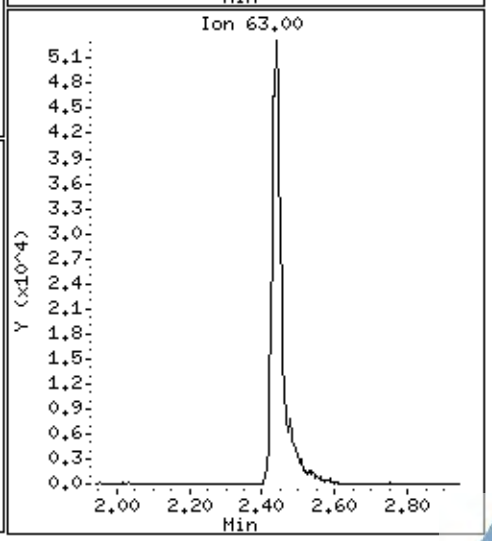












Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111408.D

Date : 14-NOV-2022 13:10

Client ID: HS22110553-06

Instrument: voa10.i

Sample Info: HS22110553-06;HS22110553-06;;;

Purge Volume: 5.0

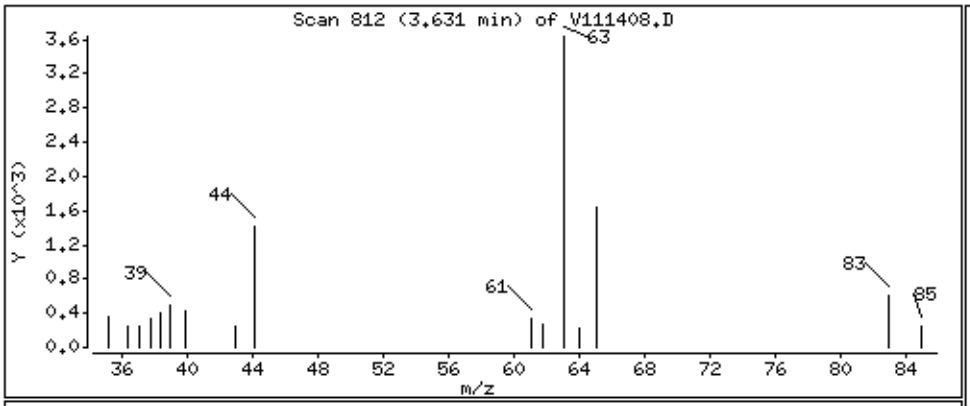
Operator: PC

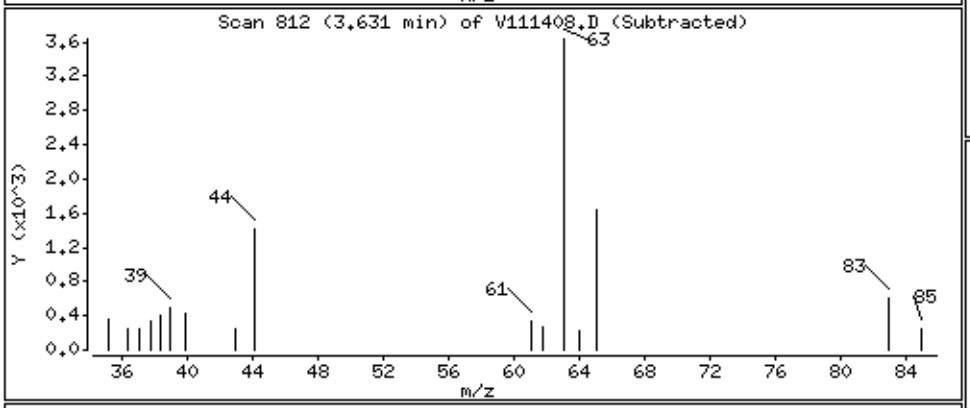
Column phase: DB624

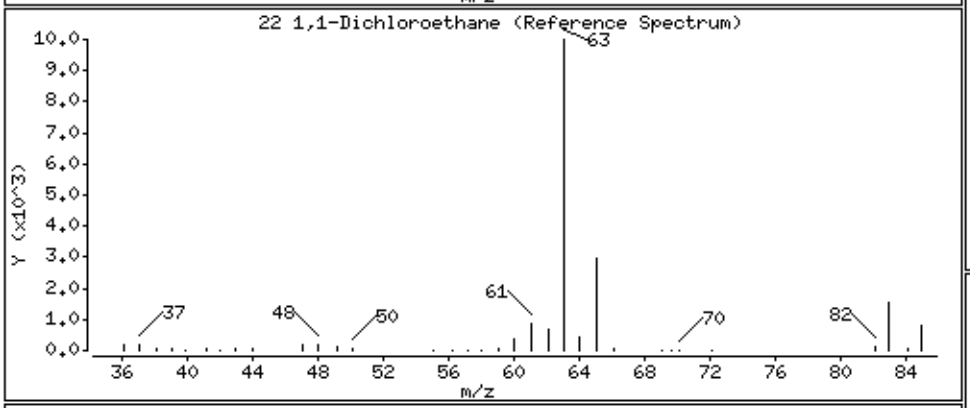
Column diameter: 0.18

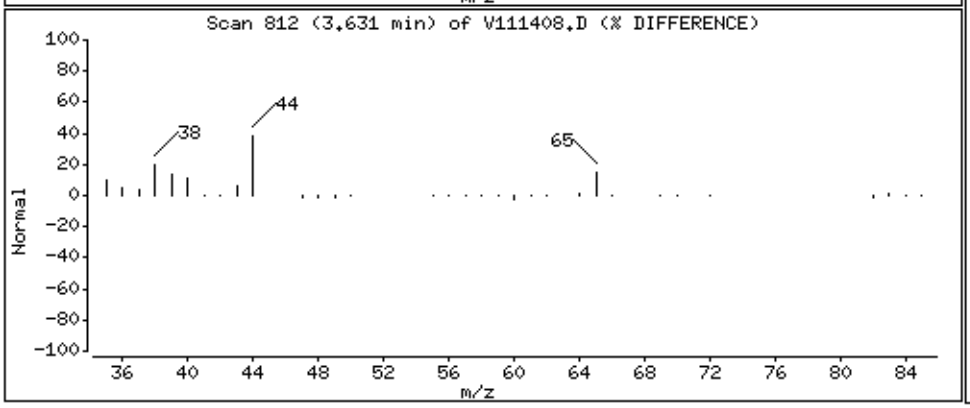
22 1,1-Dichloroethane

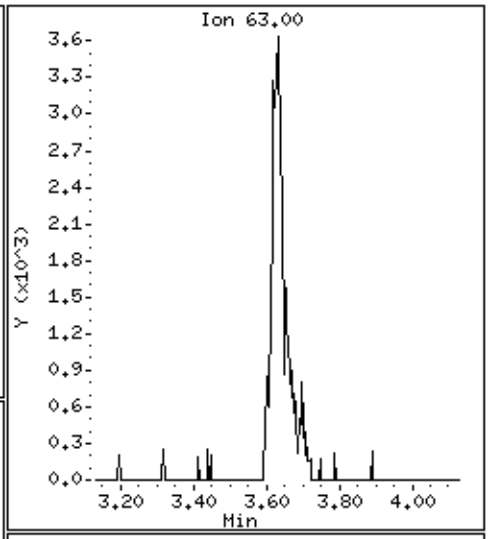
Concentration: 5.74 ug/l

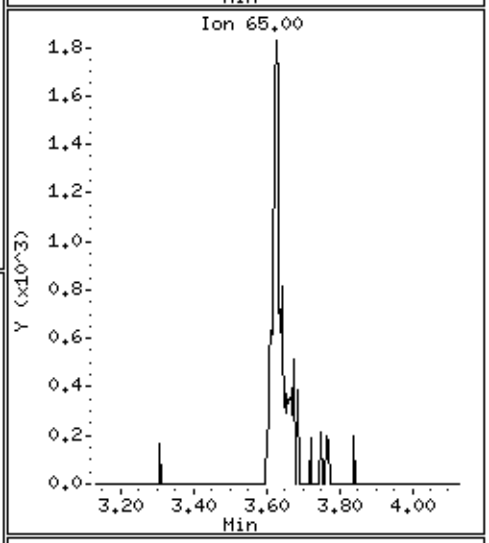


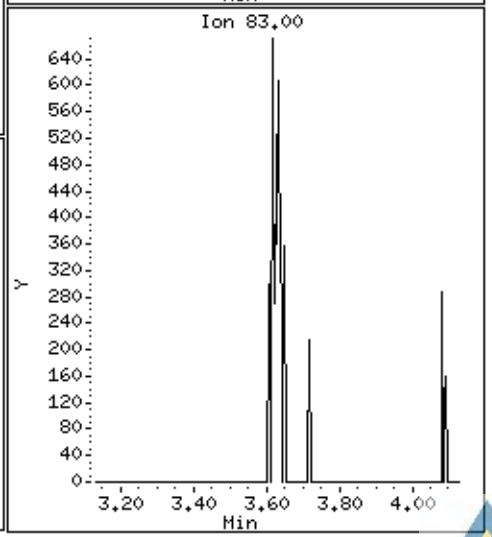












Data File : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111408.D
Inj Date : 14-NOV-2022 13:10
InstruID : voa10.i
LabSampID : HS22110553-06

Dibromofluoromethane (1868-53-7)

Reason Code:

BEFORE

MASS
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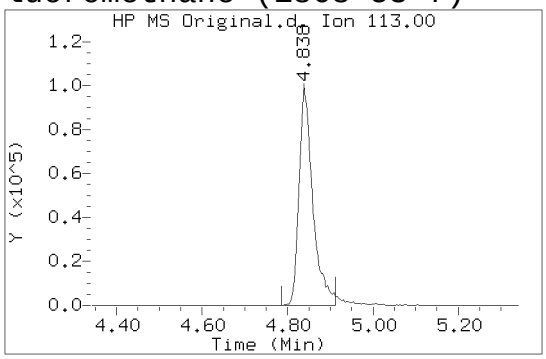
AREA
226990
HEIGHT
100872
29-Nov-2022
14:29
linh
pham



AFTER

MASS
113
AREA
226990
HEIGHT
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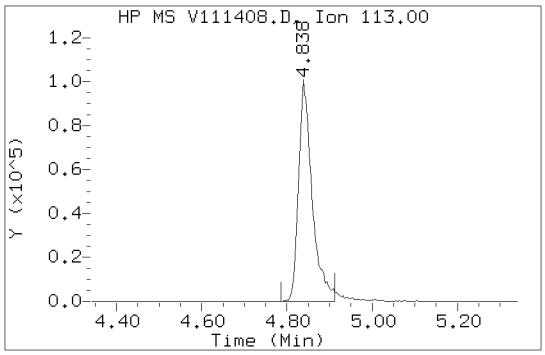
29-Nov-2022
14:41
linh
pham



BEFORE

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29-Nov-2022
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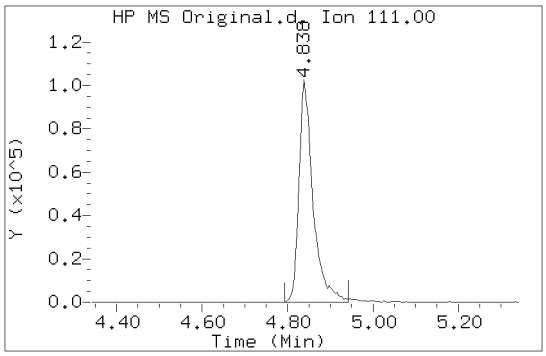

AFTER

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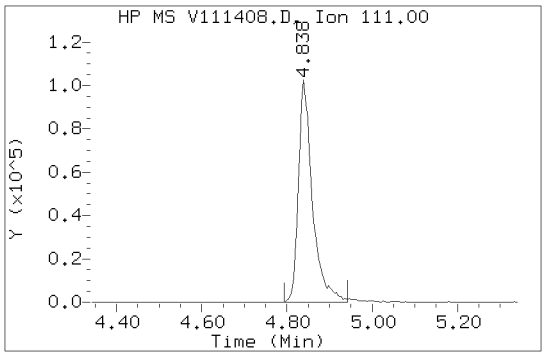
29-Nov-2022
14:41
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111409.D Page 1
Report Date: 29-Nov-2022 14:30

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111409.D
Lab Smp Id: HS22110553-06MS Client Smp ID: HS22110553-06MS
Inj Date : 14-NOV-2022 13:30
Operator : PC Inst ID: voa10.i
Smp Info : HS22110553-06MS;HS22110553-06MS;3;;MS
Misc Info : V10;WATER;0;10;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\8260C.m
Meth Date : 29-Nov-2022 14:30 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 9 QC Sample: MS
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1	Pentafluorobenzene	168	4.912	4.916	(1.000)	491535	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	107391	25.5173	255.17
3	Chloromethane	50	1.370	1.374	(0.279)	125028	27.2189	272.18
5	Vinyl Chloride	62	1.452	1.452	(0.296)	119712	26.2422	262.42
6	Bromomethane	94	1.700	1.703	(0.346)	59469	28.8831	288.83
7	Chloroethane	64	1.786	1.786	(0.364)	75157	28.6028	286.02
8	Trichlorofluoromethane	101	1.992	1.992	(0.406)	196181	32.7265	327.26
9	Acrolein	56	2.356	2.352	(0.480)	8347	41.3617	413.61
10	Acetone	43	2.491	2.494	(0.507)	77067	34.9391	349.39
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	283561	84.3458	843.45
15	Iodomethane	142	2.569	2.573	(0.523)	189829	51.9057	519.05
16	Acrylonitrile	53	3.147	3.143	(0.641)	80465	44.3863	443.86
17	Methylene Chloride	84	2.899	2.899	(0.590)	114396	35.1902	351.90
18	Methyl tert-butyl ether	73	3.192	3.195	(0.650)	260941	20.7808	207.80
19	Carbon Disulfide	76	2.629	2.633	(0.535)	643220	75.5315	755.31
20	trans-1,2-Dichloroethene	96	3.177	3.173	(0.647)	118370	31.4828	314.82
21	Vinyl Acetate	43	3.709	3.713	(0.755)	496194	49.7734	497.73(M)
22	1,1-Dichloroethane	63	3.627	3.630	(0.738)	231075	33.9515	339.51
24	2-Butanone	43	4.350	4.350	(0.886)	124816	48.9693	489.69
26	2,2-Dichloropropane	77	4.301	4.305	(0.876)	189218	31.8050	318.05

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.877)	131327	29.3871	293.87
28 Chloroform	83	4.672	4.669 (0.951)	221616	27.4446	274.44

Data File: \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111409.D Page 2
Report Date: 29-Nov-2022 14:30

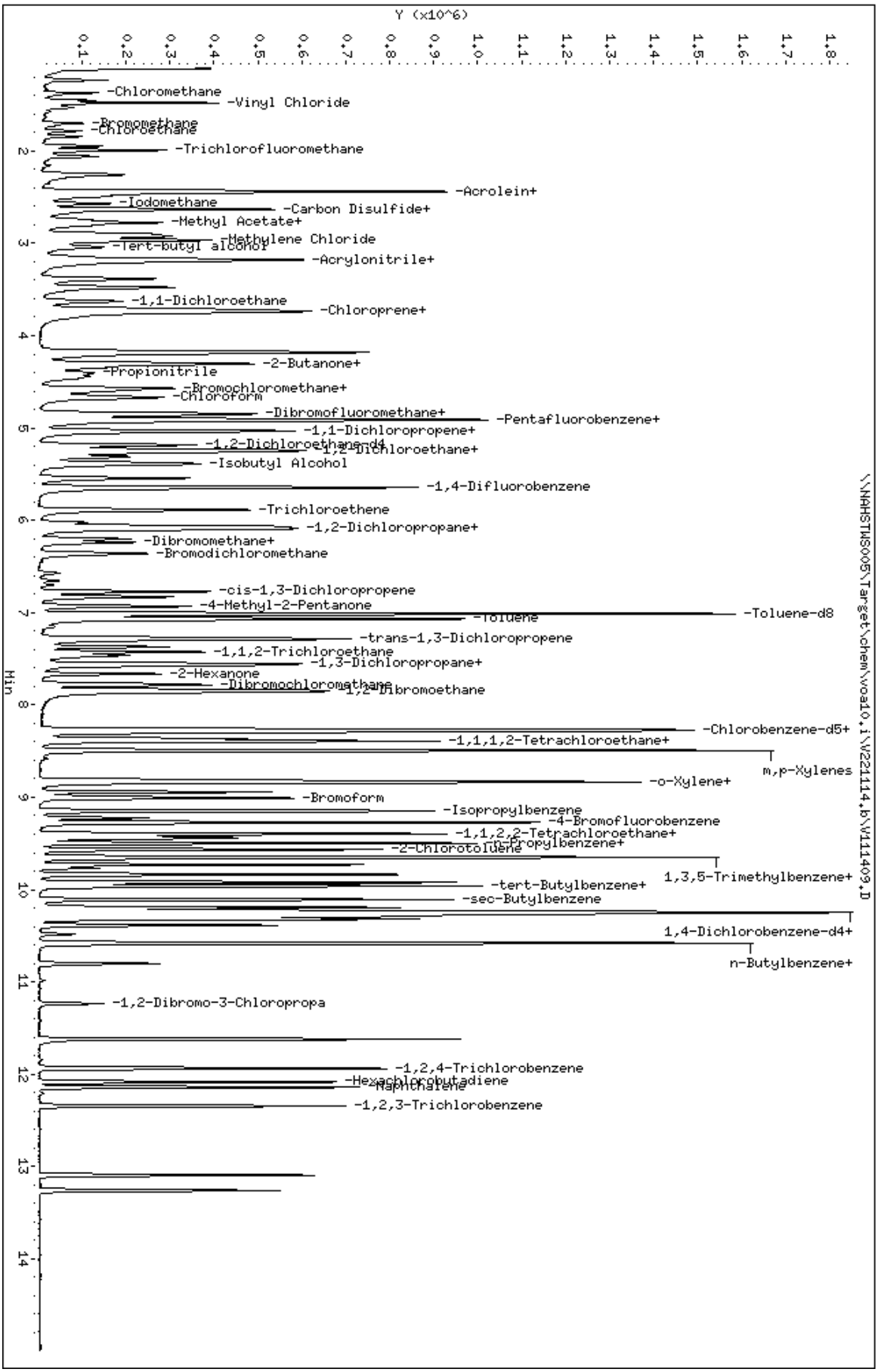
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	29 Bromochloromethane	128	4.571	4.567	(0.931)	60750	27.1707	271.70
$	30 Dibromofluoromethane	113	4.841	4.841	(0.986)	221135	53.2473	53.24
	31 1,1,1-Trichloroethane	97	4.860	4.856	(0.989)	196252	30.2501	302.50
	32 1,1-Dichloropropene	75	5.032	5.036	(0.892)	182484	32.3857	323.85
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	188904	27.9574	279.57
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	158653	32.5423	325.42
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	274207	51.9914	51.99
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	731182	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	530893	28.5223	285.22
	38 Trichloroethene	130	5.887	5.891	(1.043)	141541	29.7145	297.14
	39 Bromodichloromethane	83	6.359	6.359	(1.127)	158085	27.2276	272.27
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	146621	28.1917	281.91
	44 Dibromomethane	93	6.198	6.198	(1.098)	73490	24.6830	246.83
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	235277	43.1191	431.19
	46 cis-1,3-Dichloropropene	75	6.775	6.772	(1.201)	209580	27.0088	270.08
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	622267	50.0000	
$	48 Toluene-d8	98	7.012	7.011	(0.848)	851162	54.2493	54.24
	50 Toluene	91	7.072	7.071	(0.855)	519344	28.3166	283.16
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.288)	168505	24.7117	247.11
	52 2-Hexanone	43	7.668	7.664	(0.927)	173199	43.9959	439.95
	53 1,1,2-Trichloroethane	83	7.431	7.428	(0.899)	91847	25.0244	250.24
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	188797	25.0412	250.41
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	117686	24.5731	245.73
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	115738	30.4027	304.02
	57 1,2-Dibromoethane	107	7.859	7.862	(0.951)	108305	24.1031	241.03
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	129708	32.2225	322.22
	59 Chlorobenzene	112	8.294	8.293	(1.003)	312366	24.9544	249.54
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.368	(1.012)	112171	25.0105	250.10
	61 Ethylbenzene	106	8.391	8.391	(1.015)	165543	27.0003	270.00
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	419319	55.5520	555.52
	63 o-Xylene	106	8.830	8.833	(1.068)	195710	25.9596	259.59
	64 Styrene	104	8.841	8.845	(1.069)	344285	25.1437	251.43
	66 Bromoform	173	8.991	8.991	(1.088)	85246	24.1147	241.14
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	518803	27.7335	277.33
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	158786	23.8061	238.06
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	307799	49.7195	49.71
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	404903	50.0000	
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	179405	20.8438	208.43
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	640249	28.9885	289.88
	74 Bromobenzene	156	9.399	9.399	(0.917)	150960	24.4280	244.28
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	448708	27.2055	272.05
	76 2-Chlorotoluene	91	9.564	9.564	(0.933)	375461	27.1004	271.00
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	445986	25.8602	258.60
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	392642	27.6010	276.00
	79 1,2,4-Trimethylbenzene	105	9.966	9.962	(0.972)	465974	25.9991	259.99
	81 sec-Butylbenzene	105	10.112	10.108	(0.986)	563875	28.2012	282.01
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	508891	27.9801	279.80
	83 1,3-Dichlorobenzene	146	10.194	10.198	(0.995)	294204	23.7909	237.90
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	307772	26.5006	265.00
	87 n-Butylbenzene	91	10.577	10.576	(1.032)	481158	27.5896	275.89
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	290899	25.7633	257.63
	89 1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	26837	21.4399	214.39

90 1,2,4-Trichlorobenzene	180	11.937	11.933 (1.165)	217403	25.3815	253.81
91 Hexachlorobutadiene	225	12.083	12.083 (1.179)	118536	35.9970	359.96

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	92 Naphthalene	128	12.143	12.143	(1.185)	494038	21.6934	216.93
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	194905	24.4957	244.95
M	94 1,2-Dichloroethylene (total)	96				249697	60.8700	608.69
M	95 Xylenes (total)	106				615029	81.5116	815.11
	135 1,4-Dioxane	88	6.251	6.247	(1.272)	23382	403.190	4031.90
	141 Cyclohexane	56	4.916	4.912	(1.001)	223608	49.6938	496.93
	138 Freon TF	101	2.449	2.449	(0.499)	116239	45.4098	454.09
	147 Methylcyclohexane	55	6.063	6.071	(1.074)	178053	26.5743	265.74
	146 Methyl Acetate	43	2.806	2.809	(0.571)	107362	26.6625	266.62
	148 Tert-Butyl alcohol	59	3.042	3.042	(0.619)	180883	293.764	2937.63
	149 Isopropyl Alcohol	45	2.637	2.637	(0.537)	148268	341.386	3413.86
	72 trans-1,4-Dichloro-2-butene	53	9.448	9.448	(1.143)	48749	21.4615	214.61
	12 Isobutyl Alcohol	43	5.373	5.373	(1.094)	298997	390.128	3901.27
	13 Acetonitrile	39	2.772	2.775	(0.564)	150425	218.777	2187.76
	14 Allyl Chloride	41	2.776	2.775	(0.565)	302843	28.8255	288.25
	25 Methacrylonitrile	41	4.575	4.575	(0.931)	83507	20.3890	203.89
	40 Methyl Methacrylate	41	6.239	6.239	(1.270)	88302	18.0115	180.11
	4 Propionitrile	54	4.406	4.406	(0.897)	138286	193.461	1934.60(a)
	23 Chloroprene	53	3.735	3.739	(0.760)	224752	37.0484	370.48
	49 Ethyl Methacrylate	69	6.239	6.239	(1.106)	59939	19.1585	191.58

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.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14
-Chloromethane
-Vinyl Chloride
-Bromomethane
-Chloroethane
-Trichlorofluoromethane
-Acrolein+
-Iodomethane
-Carbon Disulfide+
-Methyl Acetate+
-Methylene Chloride
-Tert-butyl alcohol
-Acrylonitrile+
-1,1-Dichloroethane
-Chloroprene+
-2-Butanone+
-Propionitrile
-Bromochloromethane+
-Chloroform
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane-d4
-1,2-Dichloroethane+
-Isobutyl Alcohol
-1,4-Difluorobenzene
-Trichloroethene
-1,2-Dichloropropane+
-Dibromomethane+
-Bromodichloromethane
-cis-1,3-Dichloropropene
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
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-1,1,2-Trichloroethane
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-1,1,1,2-Tetrachloroethane+
m,p-Xylenes
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
n-Propylbenzene+
-2-Chlorotoluene
1,3,5-Trimethylbenzene+
-tert-Butylbenzene+
-sec-Butylbenzene
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-1,2-Dibromo-3-Chloropropa
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-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
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Instrument: voa10,i
Operator: PC
Column diameter: 0.18
Page 1

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Vinyl Acetate (108-05-4)

Reason Code:

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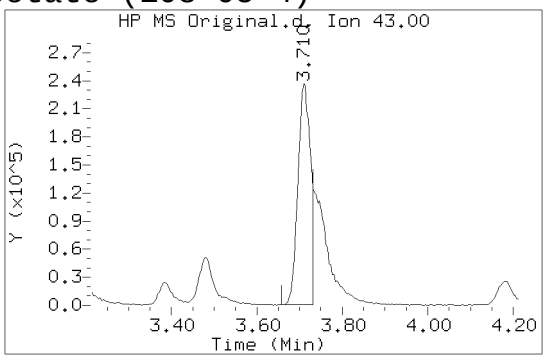

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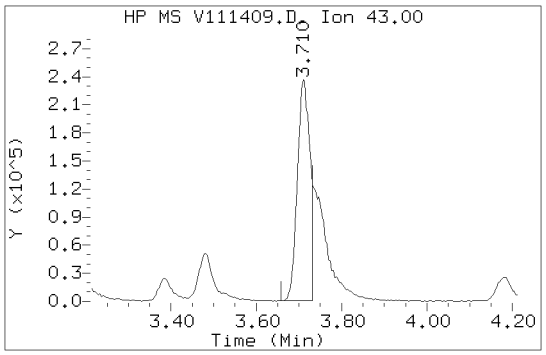

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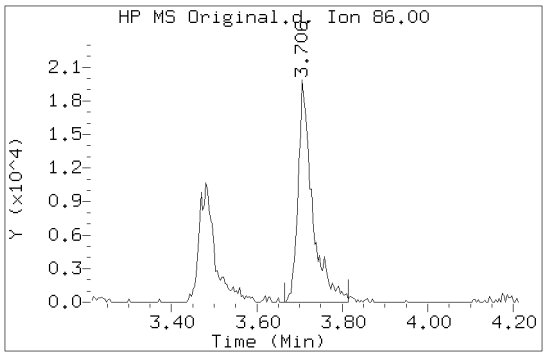

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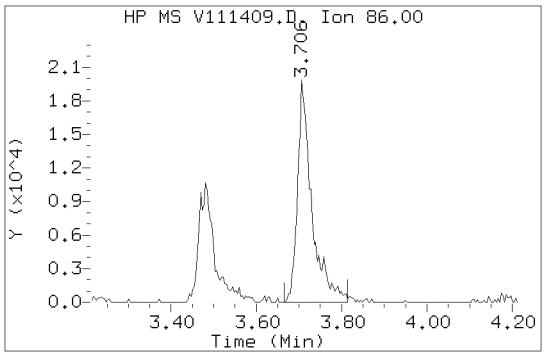

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Report Date: 29-Nov-2022 14:30

ALS Laboratory Group

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Als bottle: 9 QC Sample: MSD
Dil Factor: 10.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	10.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
* 1	Pentafluorobenzene	168	4.912	4.916	(1.000)	473620	50.0000	
2	Dichlorodifluoromethane	85	1.231	1.231	(0.251)	103438	25.5077	255.07
3	Chloromethane	50	1.370	1.374	(0.279)	116916	26.4157	264.15
5	Vinyl Chloride	62	1.452	1.452	(0.296)	119807	27.2564	272.56
6	Bromomethane	94	1.700	1.703	(0.346)	49323	24.8615	248.61
7	Chloroethane	64	1.782	1.786	(0.363)	80438	31.7705	317.70
8	Trichlorofluoromethane	101	1.992	1.992	(0.406)	197672	34.2225	342.22
9	Acrolein	56	2.341	2.352	(0.477)	7286	37.3218	373.21
10	Acetone	43	2.487	2.494	(0.506)	81141	38.6819	386.81
11	1,1-Dichloroethene	96	2.438	2.438	(0.496)	271868	84.0367	840.36
15	Iodomethane	142	2.569	2.573	(0.523)	192799	54.4353	544.35
16	Acrylonitrile	53	3.147	3.143	(0.641)	75961	43.4868	434.86
17	Methylene Chloride	84	2.896	2.899	(0.589)	112050	35.8102	358.10
18	Methyl tert-butyl ether	73	3.192	3.195	(0.650)	267513	22.1100	221.10
19	Carbon Disulfide	76	2.629	2.633	(0.535)	609509	74.3086	743.08
20	trans-1,2-Dichloroethene	96	3.173	3.173	(0.646)	114341	31.5615	315.61
21	Vinyl Acetate	43	3.709	3.713	(0.755)	521089	54.2477	542.47(M)
22	1,1-Dichloroethane	63	3.630	3.630	(0.739)	229289	34.9446	349.44
24	2-Butanone	43	4.350	4.350	(0.886)	128495	52.3196	523.19
26	2,2-Dichloropropane	77	4.305	4.305	(0.876)	181376	31.6401	316.40

27 cis-1,2-Dichloroethene	96	4.309	4.309 (0.877)	124791	28.9808	289.80
28 Chloroform	83	4.669	4.669 (0.950)	208494	26.7962	267.96

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	CONCENTRATIONS FINAL (ug/l)
	29 Bromochloromethane	128	4.571	4.567	(0.931)	63630	29.5353	295.35
$	30 Dibromofluoromethane	113	4.837	4.841	(0.985)	214165	53.5196	53.51
	31 1,1,1-Trichloroethane	97	4.856	4.856	(0.989)	185718	29.7092	297.09
	32 1,1-Dichloropropene	75	5.032	5.036	(0.892)	178883	31.9100	319.10
	33 1,2-Dichloroethane	62	5.265	5.265	(0.933)	190251	28.3016	283.01
	34 Carbon Tetrachloride	117	5.032	5.032	(0.892)	157366	32.4444	324.44
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.056)	258854	50.9368	50.93
*	36 1,4-Difluorobenzene	114	5.643	5.643	(1.000)	727439	50.0000	
	37 Benzene	78	5.242	5.242	(0.929)	510359	27.5602	275.60
	38 Trichloroethene	130	5.887	5.891	(1.043)	139519	29.4407	294.40
	39 Bromodichloromethane	83	6.359	6.359	(1.127)	154597	26.7639	267.63
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	141438	27.3350	273.35
	44 Dibromomethane	93	6.198	6.198	(1.098)	73693	24.8786	248.78
	45 4-Methyl-2-Pentanone	43	6.933	6.929	(0.839)	239698	44.9613	449.61
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.200)	208173	26.9656	269.65
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	606205	50.0000	
$	48 Toluene-d8	98	7.012	7.011	(0.848)	843863	55.2043	55.20
	50 Toluene	91	7.072	7.071	(0.855)	503129	28.1594	281.59
	51 trans-1,3-Dichloropropene	75	7.267	7.270	(1.288)	169929	25.0488	250.48
	52 2-Hexanone	43	7.664	7.664	(0.927)	175251	45.6303	456.30
	53 1,1,2-Trichloroethane	83	7.428	7.428	(0.898)	92383	25.8373	258.37
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	187494	25.5273	255.27
	55 Dibromochloromethane	129	7.765	7.769	(0.939)	112533	24.1197	241.19
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	110798	29.8762	298.76
	57 1,2-Dibromoethane	107	7.863	7.862	(0.951)	110145	25.1621	251.62
	58 1-Chlorohexane	55	8.282	8.282	(1.468)	126111	31.4902	314.90
	59 Chlorobenzene	112	8.294	8.293	(1.003)	301993	24.7650	247.65
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.368	(1.012)	110620	25.3182	253.18
	61 Ethylbenzene	106	8.391	8.391	(1.015)	161361	27.0156	270.15
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	405295	55.1168	551.16
	63 o-Xylene	106	8.830	8.833	(1.068)	192628	26.2277	262.27
	64 Styrene	104	8.845	8.845	(1.070)	339822	25.4753	254.75
	66 Bromoform	173	8.991	8.991	(1.088)	83333	24.1941	241.94
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	511643	28.0754	280.75
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	160454	25.8320	258.32
$	69 4-Bromofluorobenzene	95	9.272	9.272	(1.122)	294688	48.8791	48.87
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	377283	50.0000	
	71 1,2,3-Trichloropropane	75	9.433	9.433	(0.920)	183689	22.9039	229.03
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	609172	29.6006	296.00
	74 Bromobenzene	156	9.400	9.399	(0.917)	151152	26.2497	262.49
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	451388	29.3715	293.71
	76 2-Chlorotoluene	91	9.564	9.564	(0.933)	373611	28.8455	288.45
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	438367	27.2792	272.79
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	381794	28.8032	288.03
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	461837	27.6547	276.54
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	553391	29.7031	297.03
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	501400	29.5864	295.86
	83 1,3-Dichlorobenzene	146	10.194	10.198	(0.995)	290566	25.2169	252.16
	84 1,4-Dichlorobenzene	146	10.269	10.273	(1.002)	297059	27.4299	274.29
	87 n-Butylbenzene	91	10.577	10.576	(1.032)	476765	29.3390	293.39
	88 1,2-Dichlorobenzene	146	10.588	10.584	(1.033)	289022	27.4716	274.71
	89 1,2-Dibromo-3-Chloropropane	155	11.236	11.236	(1.096)	26233	22.4916	224.91

90 1,2,4-Trichlorobenzene	180	11.937	11.933 (1.165)	222883	27.9215	279.21
91 Hexachlorobutadiene	225	12.084	12.083 (1.179)	117893	38.2524	382.52

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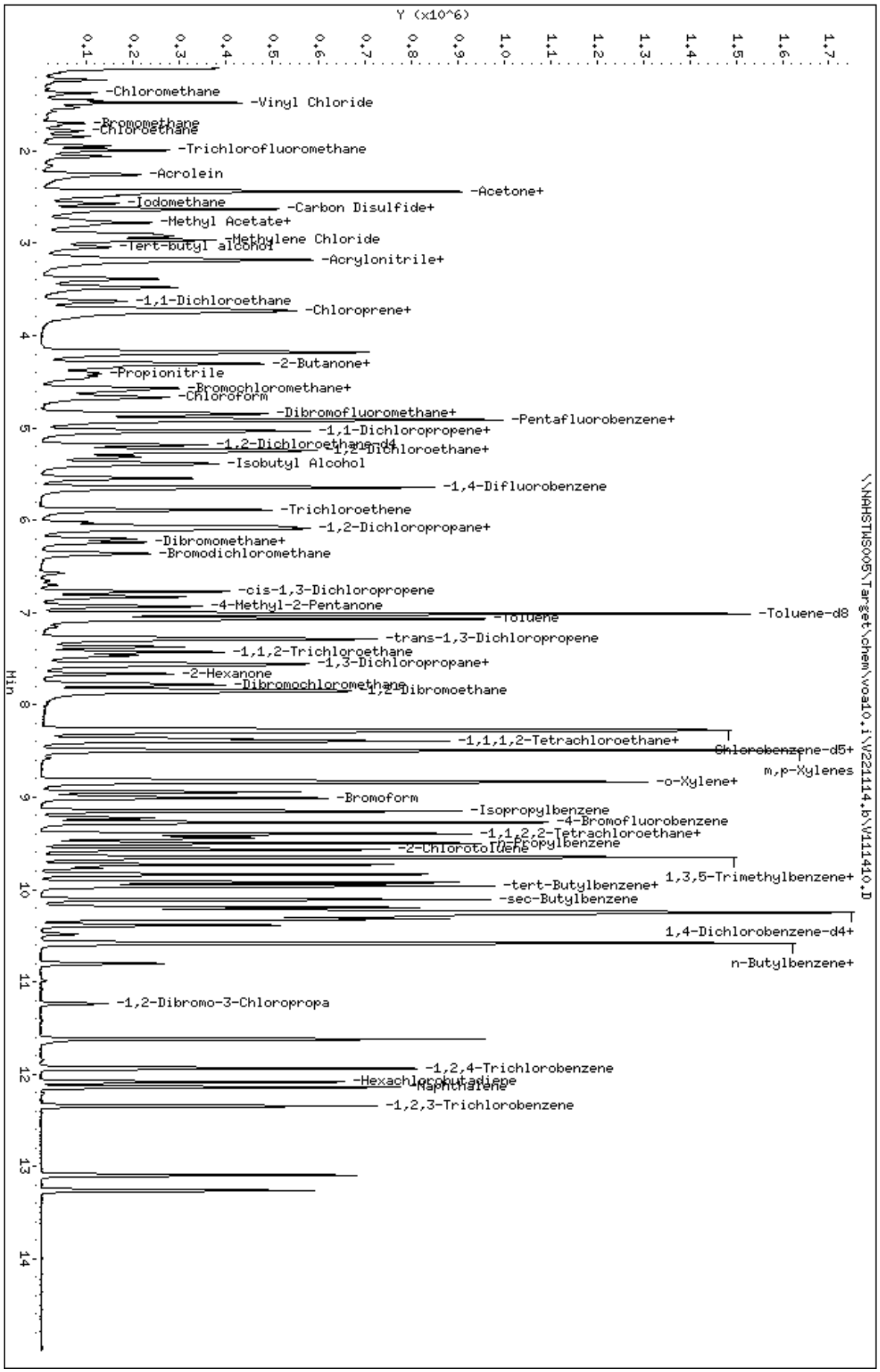
Report Date: 29-Nov-2022 14:30

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/l)	FINAL (ug/l)
	92 Naphthalene	128	12.144	12.143	(1.185)	510269	24.0464	240.46
	93 1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	196675	26.5493	265.49
M	94 1,2-Dichloroethylene (total)	96				239132	60.5424	605.42
M	95 Xylenes (total)	106				597923	81.3445	813.44
	135 1,4-Dioxane	88	6.251	6.247	(1.272)	26259	467.632	4676.32
	141 Cyclohexane	56	4.916	4.912	(1.001)	219963	50.5721	505.72
	138 Freon TF	101	2.442	2.449	(0.497)	113728	46.0228	460.22
	147 Methylcyclohexane	55	6.067	6.071	(1.075)	173411	26.0147	260.14
	146 Methyl Acetate	43	2.809	2.809	(0.572)	96711	24.9259	249.25
	148 Tert-Butyl alcohol	59	3.038	3.042	(0.618)	187613	316.219	3162.18
	149 Isopropyl Alcohol	45	2.633	2.637	(0.536)	143900	343.862	3438.61
	72 trans-1,4-Dichloro-2-butene	53	9.444	9.448	(1.142)	50932	23.0167	230.16
	12 Isobutyl Alcohol	43	5.377	5.373	(1.095)	303144	410.500	4105.00
	13 Acetonitrile	39	2.779	2.775	(0.566)	133725	201.845	2018.45
	14 Allyl Chloride	41	2.776	2.775	(0.565)	179528	17.7344	177.34
	25 Methacrylonitrile	41	4.575	4.575	(0.931)	85063	21.5545	215.54
	40 Methyl Methacrylate	41	6.239	6.239	(1.270)	93126	19.7140	197.13
	4 Propionitrile	54	4.406	4.406	(0.897)	141456	205.381	2053.81(a)
	23 Chloroprene	53	3.728	3.739	(0.759)	196938	33.6914	336.91
	49 Ethyl Methacrylate	69	6.239	6.239	(1.106)	61086	19.6256	196.25

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Column phase: DB624

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Operator: PC
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LabSampID : HS22110553-06MSD

Vinyl Acetate (108-05-4)

Reason Code:

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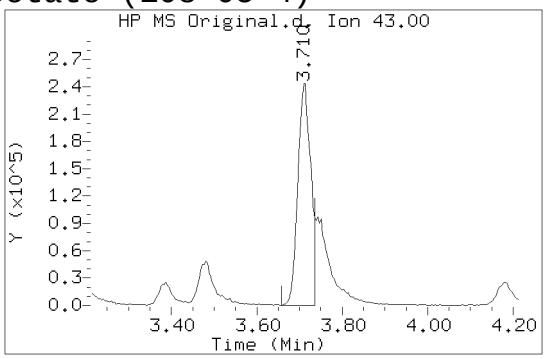
29-Nov-2022
14:29
linh
pham



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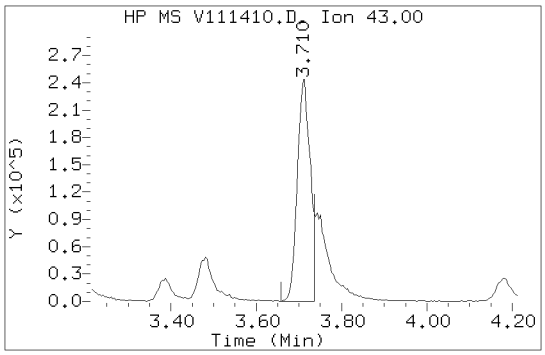

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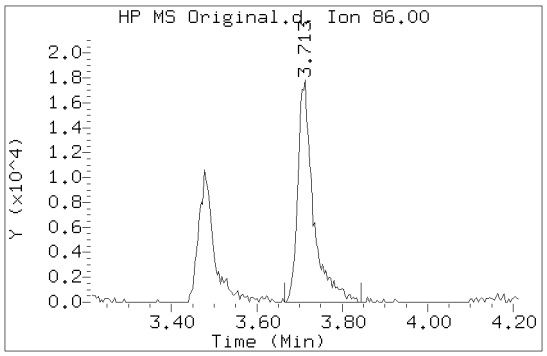

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29-Nov-2022
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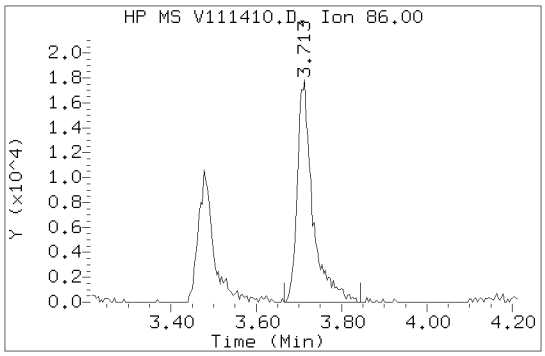

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Report Date: 29-Nov-2022 14:30

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa10.i\V221114.b\V111411.D
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Inj Date : 14-NOV-2022 14:11
Operator : PC Inst ID: voa10.i
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Misc Info : V10;WATER;0;1;
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Meth Date : 29-Nov-2022 14:30 voa10.i Quant Type: ISTD
Cal Date : 10-NOV-2022 15:37 Cal File: X111008.D
Als bottle: 10 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 430_GB.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.916	4.916	(1.000)	458866	50.0000	
2 Dichlorodifluoromethane	85	1.235	1.235	(0.251)	216610	50.0000	55.13
3 Chloromethane	50	1.370	1.370	(0.279)	241924	50.0000	56.41
5 Vinyl Chloride	62	1.448	1.448	(0.295)	233084	50.0000	54.73
6 Bromomethane	94	1.696	1.696	(0.345)	99049	50.0000	51.53
7 Chloroethane	64	1.782	1.782	(0.363)	142240	50.0000	57.98
8 Trichlorofluoromethane	101	1.992	1.992	(0.405)	306093	50.0000	54.69
9 Acrolein	56	2.348	2.348	(0.478)	20758	100.000	112.04
10 Acetone	43	2.491	2.491	(0.507)	167231	100.000	88.42
11 1,1-Dichloroethene	96	2.442	2.442	(0.497)	136455	50.0000	48.77
15 Iodomethane	142	2.569	2.569	(0.523)	401338	100.000	109.88
16 Acrylonitrile	53	3.143	3.143	(0.639)	194270	100.000	114.79
17 Methylene Chloride	84	2.899	2.899	(0.590)	198398	50.0000	66.31
18 Methyl tert-butyl ether	73	3.199	3.199	(0.651)	643212	50.0000	54.87
19 Carbon Disulfide	76	2.633	2.633	(0.536)	1017654	100.000	125.45
20 trans-1,2-Dichloroethene	96	3.173	3.173	(0.645)	189275	50.0000	53.92
21 Vinyl Acetate	43	3.713	3.713	(0.755)	1037807	100.000	111.51(M)
22 1,1-Dichloroethane	63	3.630	3.630	(0.738)	365177	50.0000	56.48
24 2-Butanone	43	4.350	4.350	(0.885)	220005	100.000	92.46
26 2,2-Dichloropropane	77	4.305	4.305	(0.876)	285434	50.0000	51.39

27 cis-1,2-Dichloroethene	96	4.305	4.305 (0.876)	211576	50.0000	50.71
28 Chloroform	83	4.676	4.676 (0.951)	374418	50.0000	49.66

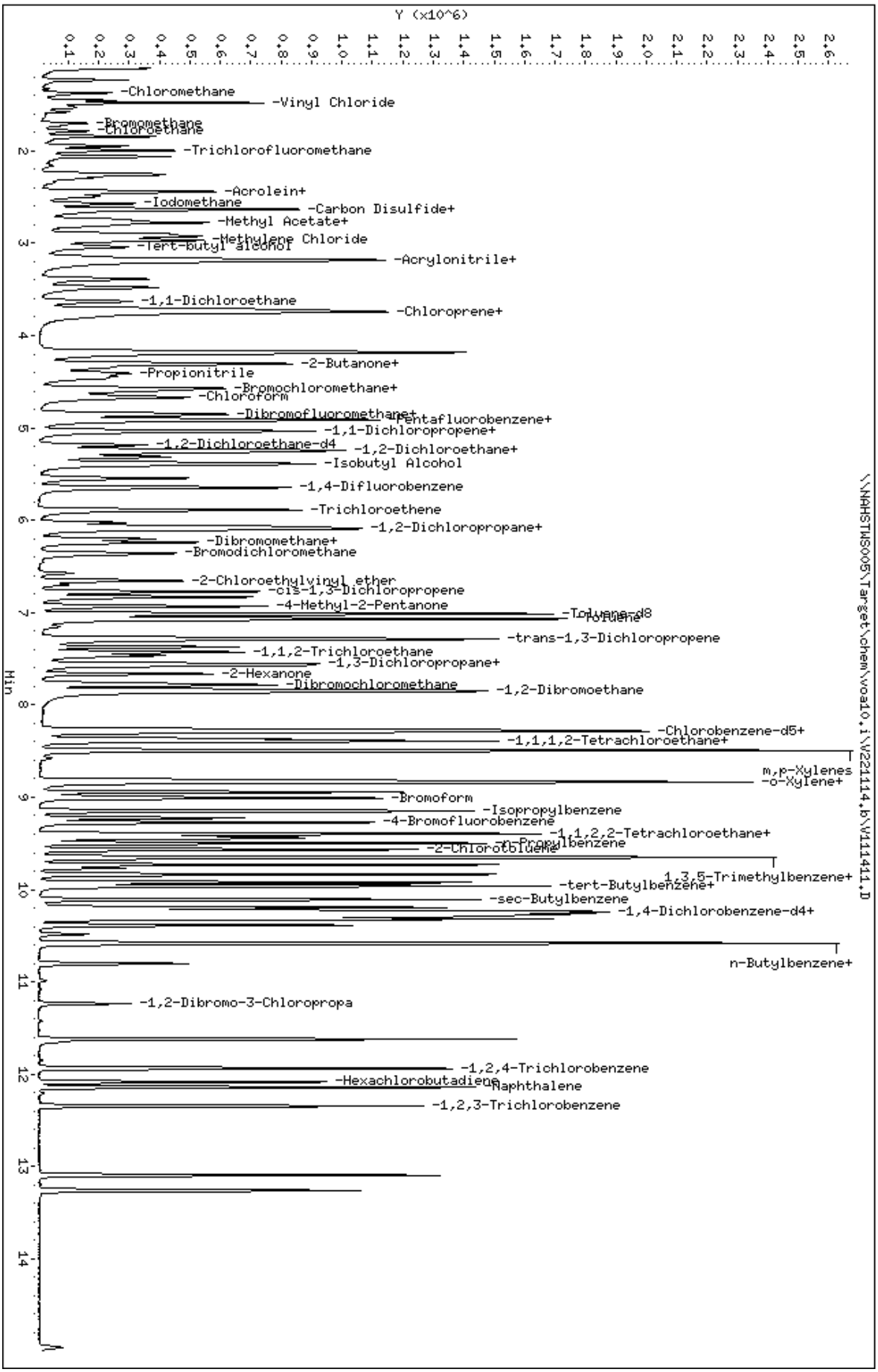
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.567	4.567	(0.929)	110107	50.0000	52.75
$	30 Dibromofluoromethane	113	4.841	4.841	(0.985)	208694	50.0000	53.82
	31 1,1,1-Trichloroethane	97	4.860	4.860	(0.989)	304529	50.0000	50.28
	32 1,1-Dichloropropene	75	5.032	5.032	(0.891)	287444	50.0000	52.41
	33 1,2-Dichloroethane	62	5.265	5.265	(0.932)	311339	50.0000	47.34
	34 Carbon Tetrachloride	117	5.032	5.032	(0.891)	241583	50.0000	50.91
$	35 1,2-Dichloroethane-d4	65	5.186	5.186	(1.055)	261638	50.0000	53.14
*	36 1,4-Difluorobenzene	114	5.647	5.647	(1.000)	711560	50.0000	
	37 Benzene	78	5.242	5.242	(0.928)	877629	50.0000	48.45
	38 Trichloroethene	130	5.887	5.887	(1.042)	231945	50.0000	50.03
	39 Bromodichloromethane	83	6.359	6.359	(1.126)	278243	50.0000	49.24
	41 2-Chloroethylvinyl ether	63	6.655	6.655	(1.179)	193704	100.000	100.86
	42 1,2-Dichloropropane	63	6.097	6.097	(1.080)	249576	50.0000	49.31
	44 Dibromomethane	93	6.198	6.198	(1.098)	134998	50.0000	46.59
	45 4-Methyl-2-Pentanone	43	6.929	6.929	(0.838)	491424	100.000	90.30
	46 cis-1,3-Dichloropropene	75	6.772	6.772	(1.199)	381630	50.0000	50.53
*	47 Chlorobenzene-d5	117	8.267	8.267	(1.000)	598170	50.0000	
$	48 Toluene-d8	98	7.011	7.011	(0.848)	804327	50.0000	53.33
	50 Toluene	91	7.071	7.071	(0.855)	870600	50.0000	49.38
	51 trans-1,3-Dichloropropene	75	7.270	7.270	(1.287)	317982	50.0000	47.91
	52 2-Hexanone	43	7.664	7.664	(0.927)	344760	100.000	89.26
	53 1,1,2-Trichloroethane	83	7.431	7.431	(0.899)	168577	50.0000	47.78
	54 1,3-Dichloropropane	76	7.574	7.574	(0.916)	351683	50.0000	48.52
	55 Dibromochloromethane	129	7.769	7.769	(0.940)	217837	50.0000	47.31
	56 Tetrachloroethene	164	7.551	7.551	(0.913)	178209	50.0000	48.69
	57 1,2-Dibromoethane	107	7.862	7.862	(0.951)	203575	50.0000	47.13
	58 1-Chlorohexane	55	8.282	8.282	(1.467)	185156	50.0000	47.26
	59 Chlorobenzene	112	8.293	8.293	(1.003)	544327	50.0000	45.23
	60 1,1,1,2-Tetrachloroethane	131	8.365	8.365	(1.012)	205950	50.0000	47.77
	61 Ethylbenzene	106	8.391	8.391	(1.015)	272211	50.0000	46.18
	62 m,p-Xylenes	106	8.496	8.496	(1.028)	675320	100.000	93.07
	63 o-Xylene	106	8.830	8.830	(1.068)	329294	50.0000	45.43
	64 Styrene	104	8.841	8.841	(1.069)	600886	50.0000	45.65
	66 Bromoform	173	8.991	8.991	(1.088)	160114	50.0000	46.01
	67 Isopropylbenzene	105	9.148	9.148	(1.107)	804785	50.0000	44.75
	68 1,1,2,2-Tetrachloroethane	83	9.396	9.396	(0.917)	303324	50.0000	47.76
$	69 4-Bromofluorobenzene	95	9.276	9.276	(1.122)	297599	50.0000	50.00
*	70 1,4-Dichlorobenzene-d4	152	10.250	10.250	(1.000)	386931	50.0000	
	71 1,2,3-Trichloropropane	75	9.437	9.437	(0.921)	353253	50.0000	42.94
	73 n-Propylbenzene	91	9.497	9.497	(0.926)	965754	50.0000	45.75
	74 Bromobenzene	156	9.399	9.399	(0.917)	264996	50.0000	44.87
	75 1,3,5-Trimethylbenzene	105	9.647	9.647	(0.941)	729781	50.0000	46.30
	76 2-Chlorotoluene	91	9.568	9.568	(0.933)	635054	50.0000	46.88
	77 4-Chlorotoluene	91	9.658	9.658	(0.942)	739031	50.0000	44.84
	78 tert-Butylbenzene	119	9.924	9.924	(0.968)	595984	50.0000	43.84
	79 1,2,4-Trimethylbenzene	105	9.962	9.962	(0.972)	763865	50.0000	44.59
	81 sec-Butylbenzene	105	10.108	10.108	(0.986)	832624	50.0000	43.57
	82 p-Isopropyltoluene	119	10.232	10.232	(0.998)	770871	50.0000	44.35
	83 1,3-Dichlorobenzene	146	10.198	10.198	(0.995)	496241	50.0000	41.99
	84 1,4-Dichlorobenzene	146	10.273	10.273	(1.002)	524051	50.0000	46.76
	87 n-Butylbenzene	91	10.576	10.576	(1.032)	725864	50.0000	43.55
	88 1,2-Dichlorobenzene	146	10.584	10.584	(1.033)	505724	50.0000	46.87

89	1,2-Dibromo-3-Chloropropane	155	11.236	11.236 (1.096)	53751	50.0000	44.93
90	1,2,4-Trichlorobenzene	180	11.937	11.937 (1.165)	378290	50.0000	46.17

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
91	Hexachlorobutadiene	225	12.083	12.083	(1.179)	164988	50.0000	50.60
92	Naphthalene	128	12.143	12.143	(1.185)	954526	50.0000	43.86
93	1,2,3-Trichlorobenzene	180	12.346	12.346	(1.204)	350270	50.0000	46.29
M 94	1,2-Dichloroethylene (total)	96				400851	100.000	(a)
135	1,4-Dioxane	88	6.247	6.247	(1.271)	46314	1000.00	839.92
141	Cyclohexane	56	4.912	4.912	(0.999)	290149	50.0000	64.85
138	Freon TF	101	2.449	2.449	(0.498)	133232	50.0000	54.14
147	Methylcyclohexane	55	6.067	6.067	(1.074)	261600	50.0000	40.12
146	Methyl Acetate	43	2.805	2.805	(0.571)	200377	50.0000	53.30
148	Tert-Butyl alcohol	59	3.042	3.042	(0.619)	385997	1000.00	671.51
149	Isopropyl Alcohol	45	2.637	2.637	(0.536)	288413	1000.00	711.34
72	trans-1,4-Dichloro-2-butene	53	9.444	9.444	(1.142)	96961	50.0000	44.40
12	Isobutyl Alcohol	43	5.377	5.377	(1.094)	689077	1000.00	963.11
13	Acetonitrile	39	2.775	2.775	(0.565)	304029	500.000	473.65
14	Allyl Chloride	41	2.775	2.775	(0.565)	451458	50.0000	46.03
25	Methacrylonitrile	41	4.579	4.579	(0.931)	199509	50.0000	52.18
40	Methyl Methacrylate	41	6.239	6.239	(1.269)	220364	50.0000	48.14
4	Propionitrile	54	4.406	4.406	(0.896)	338049	500.000	506.59
23	Chloroprene	53	3.735	3.735	(0.760)	322938	50.0000	57.02
49	Ethyl Methacrylate	69	6.243	6.243	(1.106)	145870	50.0000	47.91

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.



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Sample Info: VSTD050-END;VSTD050-END;2;;
Purge Volume: 5.0
Column phase: DB624

Instrument: voa10.i
Operator: PC
Column diameter: 0.18

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Inj Date : 14-NOV-2022 14:11
InstruID : voa10.i
LabSampID : VSTD050-END

Vinyl Acetate (108-05-4)

Reason Code:

BEFORE

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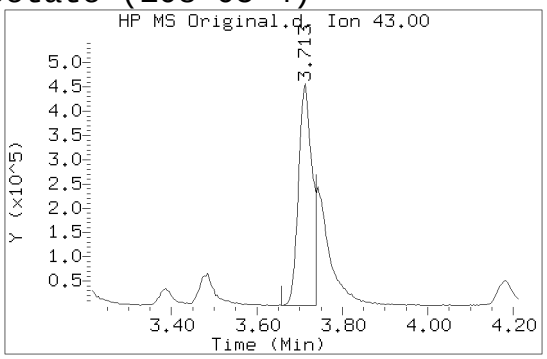
HEIGHT
456147
29-Nov-2022
14:29
linh
pham



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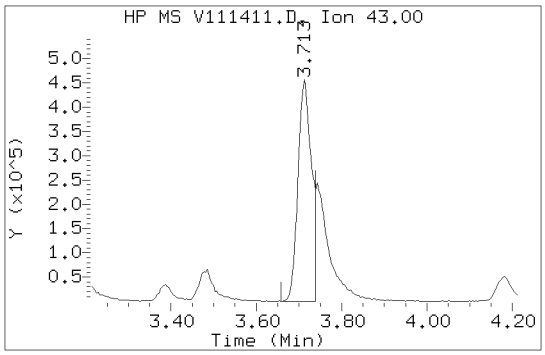

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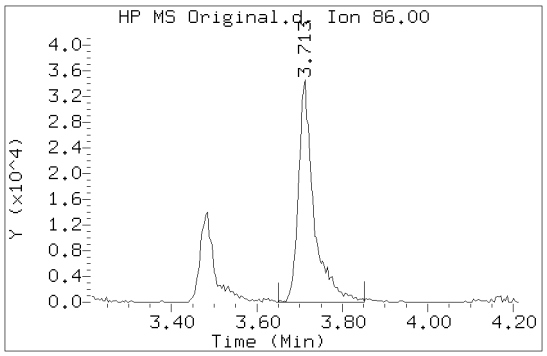

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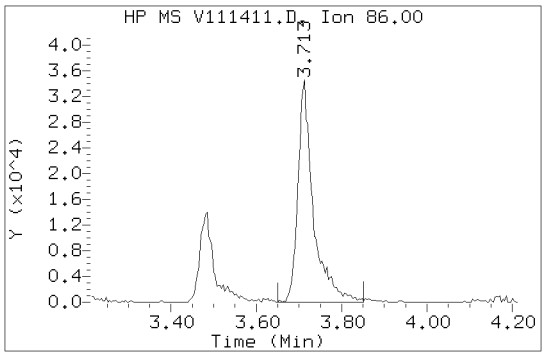

10450 Stancliff Rd. Suite 210
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WorkOrder: HS22110582

LHAAP 67 November 2022

Aptim Environmental & Infrastucture, Inc.

Vicki Graves
10333 Richmond Ave Ste 1030
Houston TX 77042

05-Dec-2022

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ALS WO# HS22110582

10450 Stancliff Rd. Suite 210
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February 07, 2023

Vicki Graves
Aptim Environmental & Infrastucture, Inc.
10333 Richmond Ave
Ste 1030
Houston, TX 77042

Work Order: **HS22110582**

Laboratory Results for: **LHAAP 67 November 2022**

Dear Vicki Graves ,

ALS Environmental received 6 sample(s) on Nov 10, 2022 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: DANE.WACASEY
Dane J. Wacasey

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Work Order: HS22110582

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS22110582-01	67WW09A-221109	Groundwater		09-Nov-2022 07:10	10-Nov-2022 09:00	☐
HS22110582-02	67WW10-221109	Groundwater		09-Nov-2022 07:55	10-Nov-2022 09:00	☐
HS22110582-03	67WW08-221109	Groundwater		09-Nov-2022 08:40	10-Nov-2022 09:00	☐
HS22110582-04	67WW08-221109-FD	Water		09-Nov-2022 08:40	10-Nov-2022 09:00	☐
HS22110582-05	67WW13-221109	Groundwater		09-Nov-2022 09:35	10-Nov-2022 09:00	☐
HS22110582-06	Trip Blank-221109	Water	CG-090622-943	09-Nov-2022 07:10	10-Nov-2022 09:00	☐

Revision:1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 67 November 2022
Work Order: HS22110582

Work Order Comments

• This report was revised February 7, 2023, to adjust the VOC analyte list to include the compounds related to site LHAAP 67.

Work Order Comments

• The analysis for CO2 by RSK175 was subcontracted to Eurofins located in Lancaster, PA. Final report attached.

GC Semivolatiles by Method RSK-175

Batch ID: R421701

Sample ID: HS22110281-01MS

• MS and MSD are for an unrelated sample

GCMS Volatiles by Method SW8260

Batch ID: R422102

Sample ID: CCV

• 4-Isopropyltoluene, Hexachlorobutadiene, n-Butylbenzene, sec-Bultybenzene and tert-Butlybenzene failed %D recovery limits for CCV. The CCV recoveries indicate potential low bias.
Normally, per SOP, the samples would have been re-analyzed to report with acceptable opening CCV. However, these analytes were added as targets after initial completion due to laboratory error of the use of incorrect analyte list. It should be noted that acceptance criteria were met for the closing CCV.

Sample ID: HS22110859-03MS

• MS and MSD are for an unrelated sample

Sample ID: 67WW13-221109 (HS22110582-05MS)

• MS and/or MSD recovered outside control limits for multiple compounds due to possible matrix effect.

Wet Chemistry by Method SW9056

Batch ID: R422228

Sample ID: 67WW13-221109 (HS22110582-05MS)

• MS and/or MSD recovered outside control limits for multiple compounds due to possible matrix effect.

WetChemistry by Method SM5310B

Batch ID: R422513,R422513

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **CASE NARRATIVE**
Project: LHAAP 67 November 2022
Work Order: HS22110582

WetChemistry by Method SW9056

Batch ID: R422228

Sample ID: 67WW08-221109 (HS22110582-03)

- Sample was analyzed outside of the holding time due to instrument problems. Results should be considered estimated.

Sample ID: 67WW08-221109-FD (HS22110582-04)

- Sample was analyzed outside of the holding time due to instrument problems. Results should be considered estimated.

Sample ID: 67WW13-221109 (HS22110582-05)

- Sample was analyzed outside of the holding time due to instrument problems. Results should be considered estimated.

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW09A-221109
Collection Date: 09-Nov-2022 07:10

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:34
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 17:34
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW09A-221109
Collection Date: 09-Nov-2022 07:10

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:34
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:34
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:34
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:34
Surr: 1,2-Dichloroethane-d4	*93.3*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 17:34*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 17:34*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 17:34*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 17:34*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW10-221109
Collection Date: 09-Nov-2022 07:55

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:56
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 17:56
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW10-221109
Collection Date: 09-Nov-2022 07:55

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 17:56
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 17:56
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 17:56
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 17:56
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 17:56*
Surr: 4-Bromofluorobenzene	*92.8*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 17:56*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 17:56*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 17:56*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,1-Dichloroethane	**5.3**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:06
1,1-Dichloroethene	**19**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:06
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,2-Dichloroethane	**0.61**	J	**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:06
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:06
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 13:06
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:06
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:06
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:06
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:06
Surr: 1,2-Dichloroethane-d4	*93.1*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 13:06*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 13:06*
Surr: Dibromofluoromethane	*91.5*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 13:06*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 13:06*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: SAM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	11-Nov-2022 16:12
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	11-Nov-2022 16:12
Methane	**0.00232**		**0.000107**	**0.000500**	**0.000500**	**mg/L**	1	11-Nov-2022 16:12
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**4.16**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Nov-2022 09:33

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**2,190**		**10.0**	**25.0**	**25.0**	**mg/L**	50	18-Nov-2022 19:25
Nitrogen, Nitrate (As N)	**0.0458**	JH	**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Nov-2022 19:20
Sulfate	**649**		**10.0**	**25.0**	**25.0**	**mg/L**	50	18-Nov-2022 19:25
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2022 10:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW08-221109-FD Lab ID:HS22110582-04
Collection Date: 09-Nov-2022 08:40 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,1-Dichloroethane	**5.2**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 12:44
1,1-Dichloroethene	**20**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 12:44
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 12:44
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 12:44
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109-FD
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 12:44
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 12:44
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 12:44
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 12:44
Surr: 1,2-Dichloroethane-d4	*93.5*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 12:44*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 12:44*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 12:44*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 12:44*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: SAM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	11-Nov-2022 16:31
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	11-Nov-2022 16:31
Methane	0.000500	U	0.000107	0.000500	0.000500	mg/L	1	11-Nov-2022 16:31
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**4.42**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Nov-2022 09:47

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW08-221109-FD
Collection Date: 09-Nov-2022 08:40

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**2,120**		**10.0**	**12.5**	**25.0**	**mg/L**	50	18-Nov-2022 20:02
Nitrogen, Nitrate (As N)	**0.0492**	JH	**0.0300**	**0.0500**	**0.100**	**mg/L**	1	18-Nov-2022 19:57
Sulfate	**629**		**10.0**	**12.5**	**25.0**	**mg/L**	50	18-Nov-2022 20:02
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2022 10:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW13-221109
Collection Date: 09-Nov-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,1,2-Trichloroethane	**4.3**		**0.30**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
1,1-Dichloroethane	**25**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
1,1-Dichloroethene	**480**		**2.0**	**10**	**10**	**ug/L**	10	17-Nov-2022 16:05
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,2-Dichloroethane	**34**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:29
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 13:29
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc. **ANALYTICAL REPORT**
Project: LHAAP 67 November 2022 WorkOrder:HS22110582
Sample ID: 67WW13-221109 Lab ID:HS22110582-05
Collection Date: 09-Nov-2022 09:35 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
cis-1,2-Dichloroethene	**1.2**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 13:29
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 13:29
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 13:29
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Trichloroethene	**2.1**		**0.20**	**1.0**	**1.0**	**ug/L**	1	17-Nov-2022 13:29
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 13:29
Surr: 1,2-Dichloroethane-d4	*91.8*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: 1,2-Dichloroethane-d4	*92.2*			**0**	*81-118*	*%REC*	*10*	*17-Nov-2022 16:05*
Surr: 4-Bromofluorobenzene	*96.0*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: 4-Bromofluorobenzene	*96.0*			**0**	*85-114*	*%REC*	*10*	*17-Nov-2022 16:05*
Surr: Dibromofluoromethane	*90.6*			**0**	*80-119*	*%REC*	*10*	*17-Nov-2022 16:05*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 13:29*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*10*	*17-Nov-2022 16:05*
DISSOLVED GASES BY RSK-175		**Method:RSK-175**						Analyst: SAM
Ethane	0.000500	U	0.000144	0.000500	0.00100	mg/L	1	11-Nov-2022 16:43
Ethene	0.000500	U	0.000234	0.000500	0.00100	mg/L	1	11-Nov-2022 16:43
Methane	0.000500	U	0.000107	0.000500	0.000500	mg/L	1	11-Nov-2022 16:43

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: 67WW13-221109
Collection Date: 09-Nov-2022 09:35

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
TOTAL ORGANIC CARBON - SM5310B-2011		**Method:SM5310B**						Analyst: JAC
Organic Carbon, Total	**2.92**		**0.500**	**1.00**	**1.00**	**mg/L**	1	23-Nov-2022 10:26
ANIONS BY SW9056A		**Method:SW9056**						Analyst: TH
Chloride	**1,460**		**10.0**	**12.5**	**25.0**	**mg/L**	50	18-Nov-2022 19:15
Nitrogen, Nitrate (As N)	**0.114**	H	**0.0300**	**0.100**	**0.100**	**mg/L**	1	18-Nov-2022 18:59
Sulfate	**348**		**10.0**	**25.0**	**25.0**	**mg/L**	50	18-Nov-2022 19:15
SUBCONTRACT ANALYSIS - RSK		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	30-Nov-2022 10:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: Trip Blank-221109
Collection Date: 09-Nov-2022 07:10

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,1-Trichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,2,2-Tetrachloroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1,2-Trichloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,1-Dichloropropene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,3-Trichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,3-Trichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,4-Trichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2,4-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dibromo-3-chloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dibromoethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dichlorobenzene	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dichloroethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,2-Dichloropropane	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,3,5-Trimethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,3-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,3-Dichloropropane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
1,4-Dichlorobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
2,2-Dichloropropane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 16:27
2-Chlorotoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2022 16:27
4-Chlorotoluene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
4-Isopropyltoluene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Acetone	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Benzene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromobenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromochloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromodichloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromoform	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Bromomethane	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Carbon tetrachloride	1.0	U	0.50	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Chlorobenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Chloroethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
Sample ID: Trip Blank-221109
Collection Date: 09-Nov-2022 07:10

ANALYTICAL REPORT
WorkOrder:HS22110582
Lab ID:HS22110582-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloroform	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Chloromethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
cis-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
cis-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Dibromochloromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Dibromomethane	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Dichlorodifluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Ethylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Isopropylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2022 16:27
Methylene chloride	1.0	U	0.40	1.0	2.0	ug/L	1	17-Nov-2022 16:27
n-Butylbenzene	1.0	U	0.40	1.0	1.0	ug/L	1	17-Nov-2022 16:27
n-Propylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Naphthalene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
o-Xylene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
sec-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Styrene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
tert-Butylbenzene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Tetrachloroethene	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Toluene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
trans-1,2-Dichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
trans-1,3-Dichloropropene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Trichloroethene	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Trichlorofluoromethane	1.0	U	0.30	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Vinyl chloride	1.0	U	0.20	1.0	1.0	ug/L	1	17-Nov-2022 16:27
Surr: 1,2-Dichloroethane-d4	*93.4*			**0**	*81-118*	*%REC*	*1*	*17-Nov-2022 16:27*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*17-Nov-2022 16:27*
Surr: Dibromofluoromethane	*91.8*			**0**	*80-119*	*%REC*	*1*	*17-Nov-2022 16:27*
Surr: Toluene-d8	*110*			**0**	*89-112*	*%REC*	*1*	*17-Nov-2022 16:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R421701 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			11 Nov 2022 16:31	1
Batch ID: R421701 (0)	**Test Name :** DISSOLVED GASES BY RSK-175				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			11 Nov 2022 16:12	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			11 Nov 2022 16:43	1
Batch ID: R422102 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			17 Nov 2022 12:44	1
HS22110582-06	Trip Blank-221109	09 Nov 2022 07:10			17 Nov 2022 16:27	1
Batch ID: R422102 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS22110582-01	67WW09A-221109	09 Nov 2022 07:10			17 Nov 2022 17:34	1
HS22110582-02	67WW10-221109	09 Nov 2022 07:55			17 Nov 2022 17:56	1
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			17 Nov 2022 13:06	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			17 Nov 2022 16:05	10
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			17 Nov 2022 13:29	1
Batch ID: R422228 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			18 Nov 2022 20:02	50
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			18 Nov 2022 19:57	1
Batch ID: R422228 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			18 Nov 2022 19:25	50
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			18 Nov 2022 19:20	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			18 Nov 2022 19:15	50
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			18 Nov 2022 18:59	1
Batch ID: R422513 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			23 Nov 2022 09:47	1
Batch ID: R422513 (0)	**Test Name :** TOTAL ORGANIC CARBON - SM5310B-2011				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			23 Nov 2022 09:33	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			23 Nov 2022 10:26	1
Batch ID: R422804 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Water	
HS22110582-04	67WW08-221109-FD	09 Nov 2022 08:40			30 Nov 2022 10:04	1
Batch ID: R422804 (0)	**Test Name :** SUBCONTRACT ANALYSIS - RSK				**Matrix:** Groundwater	
HS22110582-03	67WW08-221109	09 Nov 2022 08:40			30 Nov 2022 10:04	1
HS22110582-05	67WW13-221109	09 Nov 2022 09:35			30 Nov 2022 10:04	1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R421701 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MBLK Sample ID: **MBLK-221111** Units: **mg/L** Analysis Date: **11-Nov-2022 08:52**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978931** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.000500	0.00100								U
Ethene	0.000500	0.00100								U
Methane	0.000500	0.000500								U

LCS Sample ID: **LCS-221111** Units: **mg/L** Analysis Date: **11-Nov-2022 09:00**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978932** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0201	0.00100	0.01804	0	112	75 - 125				
Ethene	0.0186	0.00100	0.0168	0	111	75 - 125				
Methane	0.00859	0.000500	0.009647	0	89.0	75 - 125				

LCSD Sample ID: **LCSD-221111** Units: **mg/L** Analysis Date: **11-Nov-2022 09:08**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978933** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0206	0.00100	0.01804	0	114	75 - 125	0.02012	2.54	30	
Ethene	0.0190	0.00100	0.0168	0	113	75 - 125	0.01862	2.1	30	
Methane	0.00887	0.000500	0.009647	0	91.9	75 - 125	0.008588	3.23	30	

MS Sample ID: **HS22110582-05MS** Units: **mg/L** Analysis Date: **11-Nov-2022 17:06**
Client ID: **67WW13-221109** Run ID: **FID-4_421701** SeqNo: **6978955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0212	0.00100	0.01804	0	118	75 - 125				
Ethene	0.0187	0.00100	0.0168	0	111	75 - 125				
Methane	0.00886	0.000500	0.009647	0	91.8	75 - 125				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R421701 (0) **Instrument:** FID-4 **Method:** DISSOLVED GASES BY RSK-175

MS Sample ID: **HS22110281-01MS** Units: **mg/L** Analysis Date: **11-Nov-2022 14:15**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978947** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0240	0.00100	0.01804	0	133	75 - 125				S
Ethene	0.0223	0.00100	0.0168	0	133	75 - 125				S
Methane	0.00937	0.000500	0.009647	0.001261	84.1	75 - 125				

MSD Sample ID: **HS22110582-05MSD** Units: **mg/L** Analysis Date: **11-Nov-2022 17:18**
Client ID: **67WW13-221109** Run ID: **FID-4_421701** SeqNo: **6978956** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0216	0.00100	0.01804	0	119	75 - 125	0.02121	1.61	30	
Ethene	0.0195	0.00100	0.0168	0	116	75 - 125	0.01872	4.3	30	
Methane	0.00912	0.000500	0.009647	0	94.5	75 - 125	0.008861	2.83	30	

MSD Sample ID: **HS22110281-01MSD** Units: **mg/L** Analysis Date: **11-Nov-2022 14:32**
Client ID: Run ID: **FID-4_421701** SeqNo: **6978948** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ethane	0.0250	0.00100	0.01804	0	139	75 - 125	0.02404	3.91	30	S
Ethene	0.0227	0.00100	0.0168	0	135	75 - 125	0.02233	1.62	30	S
Methane	0.00951	0.000500	0.009647	0.001261	85.5	75 - 125	0.009369	1.48	30	

The following samples were analyzed in this batch: HS22110582-03 HS22110582-04 HS22110582-05

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 12:22**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	1.0	1.0								U
1,1,1-Trichloroethane	1.0	1.0								U
1,1,2,2-Tetrachloroethane	1.0	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	1.0	1.0								U
1,1,2-Trichloroethane	1.0	1.0								U
1,1-Dichloroethane	1.0	1.0								U
1,1-Dichloroethene	1.0	1.0								U
1,1-Dichloropropene	1.0	1.0								U
1,2,3-Trichlorobenzene	1.0	1.0								U
1,2,3-Trichloropropane	1.0	1.0								U
1,2,4-Trichlorobenzene	1.0	1.0								U
1,2,4-Trimethylbenzene	1.0	1.0								U
1,2-Dibromo-3-chloropropane	1.0	1.0								U
1,2-Dibromoethane	1.0	1.0								U
1,2-Dichlorobenzene	1.0	1.0								U
1,2-Dichloroethane	1.0	1.0								U
1,2-Dichloropropane	1.0	1.0								U
1,3,5-Trimethylbenzene	1.0	1.0								U
1,3-Dichlorobenzene	1.0	1.0								U
1,3-Dichloropropane	1.0	1.0								U
1,4-Dichlorobenzene	1.0	1.0								U
2,2-Dichloropropane	1.0	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	1.0	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	1.0	1.0								U
4-Isopropyltoluene	1.0	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	1.0	1.0								U
Bromobenzene	1.0	1.0								U
Bromochloromethane	1.0	1.0								U
Bromodichloromethane	1.0	1.0								U
Bromoform	1.0	1.0								U

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 12:22**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	1.0	1.0								U
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	1.0	1.0								U
Chlorobenzene	1.0	1.0								U
Chloroethane	1.0	1.0								U
Chloroform	1.0	1.0								U
Chloromethane	1.0	1.0								U
cis-1,2-Dichloroethene	1.0	1.0								U
cis-1,3-Dichloropropene	1.0	1.0								U
Dibromochloromethane	1.0	1.0								U
Dibromomethane	1.0	1.0								U
Dichlorodifluoromethane	1.0	1.0								U
Ethylbenzene	1.0	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	1.0	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	1.0	1.0								U
n-Butylbenzene	1.0	1.0								U
n-Propylbenzene	1.0	1.0								U
o-Xylene	1.0	1.0								U
sec-Butylbenzene	1.0	1.0								U
Styrene	1.0	1.0								U
tert-Butylbenzene	1.0	1.0								U
Tetrachloroethene	1.0	1.0								U
Toluene	1.0	1.0								U
trans-1,2-Dichloroethene	1.0	1.0								U
trans-1,3-Dichloropropene	1.0	1.0								U
Trichloroethene	1.0	1.0								U
Trichlorofluoromethane	1.0	1.0								U
Vinyl chloride	1.0	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.61*	*1.0*	*50*	*0*	*91.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.11*	*1.0*	*50*	*0*	*96.2*	*85 - 114*				
Surr: Dibromofluoromethane	*45.25*	*1.0*	*50*	*0*	*90.5*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 12:22**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987955** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*54.69*	*1.0*	*50*	*0*	*109*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 11:37**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987954** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.99	1.0	20	0	105	78 - 124				
1,1,1-Trichloroethane	20.17	1.0	20	0	101	74 - 131				
1,1,2,2-Tetrachloroethane	20.59	1.0	20	0	103	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	22.77	1.0	20	0	114	70 - 136				
1,1,2-Trichloroethane	20.96	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.18	1.0	20	0	95.9	77 - 125				
1,1-Dichloroethene	19.29	1.0	20	0	96.4	71 - 131				
1,1-Dichloropropene	20.08	1.0	20	0	100	78 - 125				
1,2,3-Trichlorobenzene	19.45	1.0	20	0	97.3	69 - 129				
1,2,3-Trichloropropane	20.49	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	18.41	1.0	20	0	92.0	69 - 130				
1,2,4-Trimethylbenzene	21.31	1.0	20	0	107	76 - 124				
1,2-Dibromo-3-chloropropane	16.8	1.0	20	0	84.0	62 - 128				
1,2-Dibromoethane	21.16	1.0	20	0	106	77 - 121				
1,2-Dichlorobenzene	20.12	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	20.82	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	21.13	1.0	20	0	106	78 - 122				
1,3,5-Trimethylbenzene	21.04	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	20.82	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	21.46	1.0	20	0	107	80 - 119				
1,4-Dichlorobenzene	19.78	1.0	20	0	98.9	79 - 118				
2,2-Dichloropropane	18.54	1.0	20	0	92.7	60 - 139				
2-Butanone	46.41	2.0	40	0	116	56 - 143				
2-Chlorotoluene	21.13	1.0	20	0	106	79 - 122				
2-Hexanone	38.36	2.0	40	0	95.9	57 - 139				
4-Chlorotoluene	21.04	1.0	20	0	105	78 - 122				
4-Isopropyltoluene	19.1	1.0	20	0	95.5	77 - 127				
4-Methyl-2-pentanone	40.16	2.0	40	0	100	67 - 130				
Acetone	43.83	2.0	40	0	110	39 - 160				
Benzene	20.67	1.0	20	0	103	79 - 120				
Bromobenzene	21.34	1.0	20	0	107	80 - 120				
Bromochloromethane	20.04	1.0	20	0	100	78 - 123				
Bromodichloromethane	20.2	1.0	20	0	101	79 - 125				
Bromoform	16.95	1.0	20	0	84.8	66 - 130				

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ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 11:37**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987954** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	19.75	1.0	20	0	98.7	53 - 141				
Carbon disulfide	36.1	2.0	40	0	90.3	64 - 133				
Carbon tetrachloride	23.63	1.0	20	0	118	72 - 136				
Chlorobenzene	20.46	1.0	20	0	102	82 - 118				
Chloroethane	18.93	1.0	20	0	94.6	60 - 138				
Chloroform	20.14	1.0	20	0	101	79 - 124				
Chloromethane	19.51	1.0	20	0	97.5	50 - 139				
cis-1,2-Dichloroethene	20.2	1.0	20	0	101	78 - 123				
cis-1,3-Dichloropropene	17.5	1.0	20	0	87.5	75 - 124				
Dibromochloromethane	18.58	1.0	20	0	92.9	74 - 126				
Dibromomethane	19.77	1.0	20	0	98.8	79 - 123				
Dichlorodifluoromethane	19.72	1.0	20	0	98.6	32 - 152				
Ethylbenzene	20.34	1.0	20	0	102	79 - 121				
Hexachlorobutadiene	21.01	1.0	20	0	105	66 - 134				
Isopropylbenzene	20.1	1.0	20	0	100	72 - 131				
m,p-Xylene	40.4	2.0	40	0	101	80 - 121				
Methylene chloride	21.45	2.0	20	0	107	74 - 124				
Naphthalene	18.2	1.0	20	0	91.0	61 - 128				
n-Butylbenzene	18.63	1.0	20	0	93.2	75 - 128				
n-Propylbenzene	19.65	1.0	20	0	98.2	76 - 126				
o-Xylene	20.24	1.0	20	0	101	78 - 122				
sec-Butylbenzene	18.29	1.0	20	0	91.5	77 - 126				
Styrene	19.44	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.9	78 - 124				
Tetrachloroethene	19.39	1.0	20	0	96.9	74 - 129				
Toluene	21.38	1.0	20	0	107	80 - 121				
trans-1,2-Dichloroethene	19.28	1.0	20	0	96.4	75 - 124				
trans-1,3-Dichloropropene	16.86	1.0	20	0	84.3	73 - 127				
Trichloroethene	20.17	1.0	20	0	101	79 - 123				
Trichlorofluoromethane	19.46	1.0	20	0	97.3	65 - 141				
Vinyl chloride	19.28	1.0	20	0	96.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.54*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.48*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*52.39*	*1.0*	*50*	*0*	*105*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-221117** Units: **ug/L** Analysis Date: **17-Nov-2022 11:37**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987954** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*52.05*	*1.0*	*50*	*0*	*104*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110859-03MS** Units: **ug/L** Analysis Date: **17-Nov-2022 15:20**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987963** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	11310	500	10000	0	113	78 - 124				
1,1,1-Trichloroethane	11460	500	10000	0	115	74 - 131				
1,1,2,2-Tetrachloroethane	10560	500	10000	0	106	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	40600	500	10000	31320	92.8	70 - 136				
1,1,2-Trichloroethane	10860	500	10000	0	109	80 - 119				
1,1-Dichloroethane	9665	500	10000	0	96.6	77 - 125				
1,1-Dichloroethene	10820	500	10000	0	108	71 - 131				
1,1-Dichloropropene	12810	500	10000	0	128	78 - 125				S
1,2,3-Trichlorobenzene	10960	500	10000	0	110	69 - 129				
1,2,3-Trichloropropane	9852	500	10000	0	98.5	73 - 122				
1,2,4-Trichlorobenzene	11000	500	10000	0	110	69 - 130				
1,2,4-Trimethylbenzene	12420	500	10000	0	124	76 - 124				S
1,2-Dibromo-3-chloropropane	8398	500	10000	0	84.0	62 - 128				
1,2-Dibromoethane	10730	500	10000	0	107	77 - 121				
1,2-Dichlorobenzene	11020	500	10000	0	110	80 - 119				
1,2-Dichloroethane	10370	500	10000	0	104	73 - 128				
1,2-Dichloropropane	10930	500	10000	0	109	78 - 122				
1,3,5-Trimethylbenzene	12930	500	10000	0	129	75 - 124				S
1,3-Dichlorobenzene	11640	500	10000	0	116	80 - 119				
1,3-Dichloropropane	10950	500	10000	0	110	80 - 119				
1,4-Dichlorobenzene	10970	500	10000	0	110	79 - 118				
2,2-Dichloropropane	10100	500	10000	0	101	60 - 139				
2-Butanone	18990	1000	20000	1809	85.9	56 - 143				
2-Chlorotoluene	12390	500	10000	0	124	79 - 122				S
2-Hexanone	18430	1000	20000	0	92.1	57 - 139				
4-Chlorotoluene	12160	500	10000	0	122	78 - 122				
4-Isopropyltoluene	12950	500	10000	0	130	77 - 127				S
4-Methyl-2-pentanone	19890	1000	20000	0	99.5	67 - 130				
Acetone	12770	1000	20000	0	63.9	39 - 160				
Benzene	10980	500	10000	0	110	79 - 120				
Bromobenzene	11450	500	10000	0	115	80 - 120				
Bromochloromethane	9330	500	10000	0	93.3	78 - 123				
Bromodichloromethane	10480	500	10000	0	105	79 - 125				
Bromoform	8643	500	10000	0	86.4	66 - 130				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110859-03MS** Units: **ug/L** Analysis Date: **17-Nov-2022 15:20**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987963** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	9707	500	10000	0	97.1	53 - 141				
Carbon disulfide	19190	1000	20000	0	95.9	64 - 133				
Carbon tetrachloride	14940	500	10000	0	149	72 - 136				S
Chlorobenzene	11260	500	10000	0	113	82 - 118				
Chloroethane	9810	500	10000	0	98.1	60 - 138				
Chloroform	10010	500	10000	0	100	79 - 124				
Chloromethane	9522	500	10000	0	95.2	50 - 139				
cis-1,2-Dichloroethene	10040	500	10000	0	100	78 - 123				
cis-1,3-Dichloropropene	9184	500	10000	0	91.8	75 - 124				
Dibromochloromethane	9496	500	10000	0	95.0	74 - 126				
Dibromomethane	10210	500	10000	0	102	79 - 123				
Dichlorodifluoromethane	9816	500	10000	0	98.2	32 - 152				
Ethylbenzene	12230	500	10000	0	122	79 - 121				S
Hexachlorobutadiene	14410	500	10000	0	144	66 - 134				S
Isopropylbenzene	13240	500	10000	0	132	72 - 131				S
m,p-Xylene	24170	1000	20000	0	121	80 - 121				
Methylene chloride	9707	1000	10000	0	97.1	74 - 124				
Naphthalene	10090	500	10000	0	101	61 - 128				
n-Butylbenzene	12830	500	10000	0	128	75 - 128				S
n-Propylbenzene	12830	500	10000	0	128	76 - 126				S
o-Xylene	11930	500	10000	0	119	78 - 122				
sec-Butylbenzene	12430	500	10000	0	124	77 - 126				
Styrene	10510	500	10000	0	105	78 - 123				
tert-Butylbenzene	12920	500	10000	0	129	78 - 124				S
Tetrachloroethene	23480	500	10000	10420	131	74 - 129				S
Toluene	12390	500	10000	0	124	80 - 121				S
trans-1,2-Dichloroethene	10200	500	10000	0	102	75 - 124				
trans-1,3-Dichloropropene	8528	500	10000	0	85.3	73 - 127				
Trichloroethene	40720	500	10000	29470	113	79 - 123				
Trichlorofluoromethane	11180	500	10000	0	112	65 - 141				
Vinyl chloride	10120	500	10000	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*22520*	*500*	*25000*	*0*	*90.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*25900*	*500*	*25000*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*23460*	*500*	*25000*	*0*	*93.9*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110859-03MS** Units: **ug/L** Analysis Date: **17-Nov-2022 15:20**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987963** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*27440*	*500*	*25000*	*0*	*110*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110582-05MS** Units: **ug/L** Analysis Date: **17-Nov-2022 14:36**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	23.47	1.0	20	0	117	78 - 124				
1,1,1-Trichloroethane	23.31	1.0	20	0	117	74 - 131				
1,1,2,2-Tetrachloroethane	22.34	1.0	20	0	112	71 - 121				
1,1,2-Trichlor-1,2,2-trifluoroethane	33.52	1.0	20	0	168	70 - 136				S
1,1,2-Trichloroethane	26.96	1.0	20	4.336	113	80 - 119				
1,1-Dichloroethane	44.39	1.0	20	24.96	97.2	77 - 125				
1,1-Dichloroethene	554.6	1.0	20	548.4	30.9	71 - 131				SEO
1,1-Dichloropropene	26.79	1.0	20	0	134	78 - 125				S
1,2,3-Trichlorobenzene	20.45	1.0	20	0	102	69 - 129				
1,2,3-Trichloropropane	21.77	1.0	20	0	109	73 - 122				
1,2,4-Trichlorobenzene	20.8	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	25.62	1.0	20	0	128	76 - 124				S
1,2-Dibromo-3-chloropropane	17.6	1.0	20	0	88.0	62 - 128				
1,2-Dibromoethane	22.34	1.0	20	0	112	77 - 121				
1,2-Dichlorobenzene	22.83	1.0	20	0	114	80 - 119				
1,2-Dichloroethane	56.32	1.0	20	33.95	112	73 - 128				
1,2-Dichloropropane	22.64	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	27.02	1.0	20	0	135	75 - 124				S
1,3-Dichlorobenzene	24.03	1.0	20	0	120	80 - 119				S
1,3-Dichloropropane	22.73	1.0	20	0	114	80 - 119				
1,4-Dichlorobenzene	22.23	1.0	20	0	111	79 - 118				
2,2-Dichloropropane	20.77	1.0	20	0	104	60 - 139				
2-Butanone	36.37	2.0	40	0	90.9	56 - 143				
2-Chlorotoluene	25.66	1.0	20	0	128	79 - 122				S
2-Hexanone	38.58	2.0	40	0	96.5	57 - 139				
4-Chlorotoluene	25.55	1.0	20	0	128	78 - 122				S
4-Isopropyltoluene	26.79	1.0	20	0	134	77 - 127				S
4-Methyl-2-pentanone	43.63	2.0	40	0	109	67 - 130				
Acetone	25.37	2.0	40	0	63.4	39 - 160				
Benzene	23.37	1.0	20	0	117	79 - 120				
Bromobenzene	23.82	1.0	20	0	119	80 - 120				
Bromochloromethane	19.17	1.0	20	0	95.9	78 - 123				
Bromodichloromethane	21.77	1.0	20	0	109	79 - 125				
Bromoform	17.73	1.0	20	0	88.6	66 - 130				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110582-05MS** Units: **ug/L** Analysis Date: **17-Nov-2022 14:36**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	20.3	1.0	20	0	102	53 - 141				
Carbon disulfide	38.82	2.0	40	0	97.0	64 - 133				
Carbon tetrachloride	31.48	1.0	20	0	157	72 - 136				S
Chlorobenzene	23.4	1.0	20	0	117	82 - 118				
Chloroethane	20.06	1.0	20	0	100	60 - 138				
Chloroform	20.9	1.0	20	0	105	79 - 124				
Chloromethane	19.49	1.0	20	0	97.5	50 - 139				
cis-1,2-Dichloroethene	21.48	1.0	20	1.231	101	78 - 123				
cis-1,3-Dichloropropene	18.7	1.0	20	0	93.5	75 - 124				
Dibromochloromethane	19.39	1.0	20	0	96.9	74 - 126				
Dibromomethane	21.31	1.0	20	0	107	79 - 123				
Dichlorodifluoromethane	20.71	1.0	20	0	104	32 - 152				
Ethylbenzene	25.48	1.0	20	0	127	79 - 121				S
Hexachlorobutadiene	31.61	1.0	20	0	158	66 - 134				S
Isopropylbenzene	26.93	1.0	20	0	135	72 - 131				S
m,p-Xylene	48.96	2.0	40	0	122	80 - 121				S
Methylene chloride	19.7	2.0	20	0	98.5	74 - 124				
Naphthalene	18.17	1.0	20	0	90.9	61 - 128				
n-Butylbenzene	26.1	1.0	20	0	131	75 - 128				S
n-Propylbenzene	26.62	1.0	20	0	133	76 - 126				S
o-Xylene	24.45	1.0	20	0	122	78 - 122				S
sec-Butylbenzene	25.93	1.0	20	0	130	77 - 126				S
Styrene	20.47	1.0	20	0	102	78 - 123				
tert-Butylbenzene	27.11	1.0	20	0	136	78 - 124				S
Tetrachloroethene	27.8	1.0	20	0	139	74 - 129				S
Toluene	25.57	1.0	20	0	128	80 - 121				S
trans-1,2-Dichloroethene	20.79	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	17.11	1.0	20	0	85.6	73 - 127				
Trichloroethene	27.86	1.0	20	2.116	129	79 - 123				S
Trichlorofluoromethane	22.55	1.0	20	0	113	65 - 141				
Vinyl chloride	21.09	1.0	20	0	105	58 - 137				
Surr: 1,2-Dichloroethane-d4	*44.22*	*1.0*	*50*	*0*	*88.4*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.8*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*45.99*	*1.0*	*50*	*0*	*92.0*	*80 - 119*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS22110582-05MS** Units: **ug/L** Analysis Date: **17-Nov-2022 14:36**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987961** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*55.01*	*1.0*	*50*	*0*	*110*	*89 - 112*				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110859-03MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 15:42**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987964** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	11080	500	10000	0	111	78 - 124	11310	2.04	20	
1,1,1-Trichloroethane	10910	500	10000	0	109	74 - 131	11460	4.87	20	
1,1,2,2-Tetrachloroethane	10670	500	10000	0	107	71 - 121	10560	1.08	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	38800	500	10000	31320	74.8	70 - 136	40600	4.54	20	
1,1,2-Trichloroethane	10500	500	10000	0	105	80 - 119	10860	3.29	20	
1,1-Dichloroethane	9313	500	10000	0	93.1	77 - 125	9665	3.71	20	
1,1-Dichloroethene	10080	500	10000	0	101	71 - 131	10820	7.09	20	
1,1-Dichloropropene	12020	500	10000	0	120	78 - 125	12810	6.3	20	
1,2,3-Trichlorobenzene	10990	500	10000	0	110	69 - 129	10960	0.231	20	
1,2,3-Trichloropropane	10270	500	10000	0	103	73 - 122	9852	4.11	20	
1,2,4-Trichlorobenzene	10980	500	10000	0	110	69 - 130	11000	0.169	20	
1,2,4-Trimethylbenzene	12440	500	10000	0	124	76 - 124	12420	0.2	20	S
1,2-Dibromo-3-chloropropane	8536	500	10000	0	85.4	62 - 128	8398	1.63	20	
1,2-Dibromoethane	10690	500	10000	0	107	77 - 121	10730	0.416	20	
1,2-Dichlorobenzene	10580	500	10000	0	106	80 - 119	11020	4.02	20	
1,2-Dichloroethane	10270	500	10000	0	103	73 - 128	10370	0.953	20	
1,2-Dichloropropane	10610	500	10000	0	106	78 - 122	10930	2.91	20	
1,3,5-Trimethylbenzene	12580	500	10000	0	126	75 - 124	12930	2.71	20	S
1,3-Dichlorobenzene	11280	500	10000	0	113	80 - 119	11640	3.17	20	
1,3-Dichloropropane	10810	500	10000	0	108	80 - 119	10950	1.27	20	
1,4-Dichlorobenzene	10640	500	10000	0	106	79 - 118	10970	3.05	20	
2,2-Dichloropropane	9741	500	10000	0	97.4	60 - 139	10100	3.66	20	
2-Butanone	19310	1000	20000	1809	87.5	56 - 143	18990	1.68	20	
2-Chlorotoluene	12190	500	10000	0	122	79 - 122	12390	1.62	20	
2-Hexanone	18340	1000	20000	0	91.7	57 - 139	18430	0.467	20	
4-Chlorotoluene	11960	500	10000	0	120	78 - 122	12160	1.64	20	
4-Isopropyltoluene	12690	500	10000	0	127	77 - 127	12950	2.08	20	
4-Methyl-2-pentanone	20350	1000	20000	0	102	67 - 130	19890	2.25	20	
Acetone	13720	1000	20000	0	68.6	39 - 160	12770	7.18	20	
Benzene	10680	500	10000	0	107	79 - 120	10980	2.85	20	
Bromobenzene	11130	500	10000	0	111	80 - 120	11450	2.83	20	
Bromochloromethane	9317	500	10000	0	93.2	78 - 123	9330	0.138	20	
Bromodichloromethane	9942	500	10000	0	99.4	79 - 125	10480	5.26	20	
Bromoform	8688	500	10000	0	86.9	66 - 130	8643	0.517	20	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110859-03MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 15:42**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987964** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	9100	500	10000	0	91.0	53 - 141	9707	6.46	20	
Carbon disulfide	18350	1000	20000	0	91.8	64 - 133	19190	4.45	20	
Carbon tetrachloride	14350	500	10000	0	143	72 - 136	14940	4.04	20	S
Chlorobenzene	11020	500	10000	0	110	82 - 118	11260	2.15	20	
Chloroethane	9646	500	10000	0	96.5	60 - 138	9810	1.69	20	
Chloroform	9747	500	10000	0	97.5	79 - 124	10010	2.65	20	
Chloromethane	8910	500	10000	0	89.1	50 - 139	9522	6.64	20	
cis-1,2-Dichloroethene	9637	500	10000	0	96.4	78 - 123	10040	4.11	20	
cis-1,3-Dichloropropene	8960	500	10000	0	89.6	75 - 124	9184	2.46	20	
Dibromochloromethane	9456	500	10000	0	94.6	74 - 126	9496	0.425	20	
Dibromomethane	9930	500	10000	0	99.3	79 - 123	10210	2.76	20	
Dichlorodifluoromethane	9387	500	10000	0	93.9	32 - 152	9816	4.46	20	
Ethylbenzene	11930	500	10000	0	119	79 - 121	12230	2.49	20	
Hexachlorobutadiene	13960	500	10000	0	140	66 - 134	14410	3.12	20	S
Isopropylbenzene	12750	500	10000	0	128	72 - 131	13240	3.77	20	
m,p-Xylene	23670	1000	20000	0	118	80 - 121	24170	2.09	20	
Methylene chloride	9458	1000	10000	0	94.6	74 - 124	9707	2.6	20	
Naphthalene	10320	500	10000	0	103	61 - 128	10090	2.21	20	
n-Butylbenzene	12650	500	10000	0	127	75 - 128	12830	1.38	20	
n-Propylbenzene	12720	500	10000	0	127	76 - 126	12830	0.838	20	S
o-Xylene	11470	500	10000	0	115	78 - 122	11930	3.96	20	
sec-Butylbenzene	12290	500	10000	0	123	77 - 126	12430	1.12	20	
Styrene	10340	500	10000	0	103	78 - 123	10510	1.61	20	
tert-Butylbenzene	12710	500	10000	0	127	78 - 124	12920	1.67	20	S
Tetrachloroethene	22140	500	10000	10420	117	74 - 129	23480	5.89	20	
Toluene	11980	500	10000	0	120	80 - 121	12390	3.39	20	
trans-1,2-Dichloroethene	9611	500	10000	0	96.1	75 - 124	10200	5.91	20	
trans-1,3-Dichloropropene	8565	500	10000	0	85.7	73 - 127	8528	0.435	20	
Trichloroethene	38890	500	10000	29470	94.2	79 - 123	40720	4.62	20	
Trichlorofluoromethane	10780	500	10000	0	108	65 - 141	11180	3.68	20	
Vinyl chloride	9718	500	10000	0	97.2	58 - 137	10120	4.1	20	
Surr: 1,2-Dichloroethane-d4	*22470*	*500*	*25000*	*0*	*89.9*	*81 - 118*	*22520*	*0.208*	*20*	
Surr: 4-Bromofluorobenzene	*25860*	*500*	*25000*	*0*	*103*	*85 - 114*	*25900*	*0.158*	*20*	
Surr: Dibromofluoromethane	*23020*	*500*	*25000*	*0*	*92.1*	*80 - 119*	*23460*	*1.93*	*20*	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110859-03MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 15:42**
Client ID: Run ID: **VOA9_422102** SeqNo: **6987964** PrepDate: DF: **500**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*27630*	*500*	*25000*	*0*	*111*	*89 - 112*	*27440*	*0.722*	*20*	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110582-05MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 14:58**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.95	1.0	20	0	110	78 - 124	23.47	6.69	20	
1,1,1-Trichloroethane	22.91	1.0	20	0	115	74 - 131	23.31	1.71	20	
1,1,2,2-Tetrachloroethane	21.1	1.0	20	0	106	71 - 121	22.34	5.68	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	31.57	1.0	20	0	158	70 - 136	33.52	6	20	S
1,1,2-Trichloroethane	25.21	1.0	20	4.336	104	80 - 119	26.96	6.68	20	
1,1-Dichloroethane	43.57	1.0	20	24.96	93.0	77 - 125	44.39	1.88	20	
1,1-Dichloroethene	546.2	1.0	20	548.4	-11.1	71 - 131	554.6	1.53	20	SEO
1,1-Dichloropropene	25.33	1.0	20	0	127	78 - 125	26.79	5.6	20	S
1,2,3-Trichlorobenzene	21.33	1.0	20	0	107	69 - 129	20.45	4.22	20	
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122	21.77	6.01	20	
1,2,4-Trichlorobenzene	21.57	1.0	20	0	108	69 - 130	20.8	3.59	20	
1,2,4-Trimethylbenzene	24.94	1.0	20	0	125	76 - 124	25.62	2.68	20	S
1,2-Dibromo-3-chloropropane	16.93	1.0	20	0	84.6	62 - 128	17.6	3.91	20	
1,2-Dibromoethane	21.89	1.0	20	0	109	77 - 121	22.34	2.07	20	
1,2-Dichlorobenzene	22.08	1.0	20	0	110	80 - 119	22.83	3.32	20	
1,2-Dichloroethane	54.59	1.0	20	33.95	103	73 - 128	56.32	3.11	20	
1,2-Dichloropropane	21.8	1.0	20	0	109	78 - 122	22.64	3.78	20	
1,3,5-Trimethylbenzene	26.03	1.0	20	0	130	75 - 124	27.02	3.73	20	S
1,3-Dichlorobenzene	23.58	1.0	20	0	118	80 - 119	24.03	1.91	20	
1,3-Dichloropropane	21.86	1.0	20	0	109	80 - 119	22.73	3.91	20	
1,4-Dichlorobenzene	21.83	1.0	20	0	109	79 - 118	22.23	1.81	20	
2,2-Dichloropropane	19.91	1.0	20	0	99.6	60 - 139	20.77	4.22	20	
2-Butanone	35.34	2.0	40	0	88.3	56 - 143	36.37	2.87	20	
2-Chlorotoluene	24.85	1.0	20	0	124	79 - 122	25.66	3.22	20	S
2-Hexanone	37.29	2.0	40	0	93.2	57 - 139	38.58	3.42	20	
4-Chlorotoluene	24.28	1.0	20	0	121	78 - 122	25.55	5.08	20	
4-Isopropyltoluene	25.74	1.0	20	0	129	77 - 127	26.79	3.98	20	S
4-Methyl-2-pentanone	41.31	2.0	40	0	103	67 - 130	43.63	5.45	20	
Acetone	23.25	2.0	40	0	58.1	39 - 160	25.37	8.74	20	
Benzene	22.44	1.0	20	0	112	79 - 120	23.37	4.06	20	
Bromobenzene	22.91	1.0	20	0	115	80 - 120	23.82	3.9	20	
Bromochloromethane	18.56	1.0	20	0	92.8	78 - 123	19.17	3.28	20	
Bromodichloromethane	20.84	1.0	20	0	104	79 - 125	21.77	4.4	20	
Bromoform	17.05	1.0	20	0	85.2	66 - 130	17.73	3.91	20	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110582-05MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 14:58**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Bromomethane	19.15	1.0	20	0	95.8	53 - 141	20.3	5.81	20	
Carbon disulfide	38.08	2.0	40	0	95.2	64 - 133	38.82	1.91	20	
Carbon tetrachloride	30	1.0	20	0	150	72 - 136	31.48	4.81	20	S
Chlorobenzene	22.63	1.0	20	0	113	82 - 118	23.4	3.36	20	
Chloroethane	19.59	1.0	20	0	98.0	60 - 138	20.06	2.34	20	
Chloroform	20.4	1.0	20	0	102	79 - 124	20.9	2.42	20	
Chloromethane	19	1.0	20	0	95.0	50 - 139	19.49	2.56	20	
cis-1,2-Dichloroethene	20.83	1.0	20	1.231	98.0	78 - 123	21.48	3.05	20	
cis-1,3-Dichloropropene	18.01	1.0	20	0	90.0	75 - 124	18.7	3.78	20	
Dibromochloromethane	18.66	1.0	20	0	93.3	74 - 126	19.39	3.8	20	
Dibromomethane	20.55	1.0	20	0	103	79 - 123	21.31	3.59	20	
Dichlorodifluoromethane	20.12	1.0	20	0	101	32 - 152	20.71	2.88	20	
Ethylbenzene	24.24	1.0	20	0	121	79 - 121	25.48	5	20	S
Hexachlorobutadiene	30.11	1.0	20	0	151	66 - 134	31.61	4.85	20	S
Isopropylbenzene	25.91	1.0	20	0	130	72 - 131	26.93	3.88	20	
m,p-Xylene	47.82	2.0	40	0	120	80 - 121	48.96	2.35	20	
Methylene chloride	19.11	2.0	20	0	95.6	74 - 124	19.7	3.05	20	
Naphthalene	19.93	1.0	20	0	99.6	61 - 128	18.17	9.23	20	
n-Butylbenzene	26.11	1.0	20	0	131	75 - 128	26.1	0.00496	20	S
n-Propylbenzene	25.98	1.0	20	0	130	76 - 126	26.62	2.41	20	S
o-Xylene	23.56	1.0	20	0	118	78 - 122	24.45	3.69	20	
sec-Butylbenzene	25.32	1.0	20	0	127	77 - 126	25.93	2.36	20	S
Styrene	19.65	1.0	20	0	98.3	78 - 123	20.47	4.07	20	
tert-Butylbenzene	26.29	1.0	20	0	131	78 - 124	27.11	3.08	20	S
Tetrachloroethene	25.63	1.0	20	0	128	74 - 129	27.8	8.12	20	
Toluene	24.11	1.0	20	0	121	80 - 121	25.57	5.85	20	
trans-1,2-Dichloroethene	20.67	1.0	20	0	103	75 - 124	20.79	0.616	20	
trans-1,3-Dichloropropene	16.83	1.0	20	0	84.1	73 - 127	17.11	1.69	20	
Trichloroethene	25.5	1.0	20	2.116	117	79 - 123	27.86	8.81	20	
Trichlorofluoromethane	22.17	1.0	20	0	111	65 - 141	22.55	1.69	20	
Vinyl chloride	20.61	1.0	20	0	103	58 - 137	21.09	2.3	20	
Surr: 1,2-Dichloroethane-d4	*45.08*	*1.0*	*50*	*0*	*90.2*	*81 - 118*	*44.22*	*1.93*	*20*	
Surr: 4-Bromofluorobenzene	*51.84*	*1.0*	*50*	*0*	*104*	*85 - 114*	*51.8*	*0.0733*	*20*	
Surr: Dibromofluoromethane	*46.98*	*1.0*	*50*	*0*	*94.0*	*80 - 119*	*45.99*	*2.13*	*20*	

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422102 (0) **Instrument:** VOA9 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS22110582-05MSD** Units: **ug/L** Analysis Date: **17-Nov-2022 14:58**
Client ID: **67WW13-221109** Run ID: **VOA9_422102** SeqNo: **6987962** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	*54.04*	*1.0*	*50*	*0*	*108*	*89 - 112*	*55.01*	*1.79*	*20*	

The following samples were analyzed in this batch: HS22110582-01 HS22110582-02 HS22110582-03 HS22110582-04 HS22110582-05 HS22110582-06

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422228 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **18-Nov-2022 17:03**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991408** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.250	0.500								U
Nitrogen, Nitrate (As N)	0.100	0.100								U
Nitrogen, Nitrite (As N)	0.0500	0.100								U
Sulfate	0.500	0.500								U

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **18-Nov-2022 17:08**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.26	0.500	20	0	96.3	80 - 120				
Nitrogen, Nitrate (As N)	3.901	0.100	4	0	97.5	80 - 120				
Nitrogen, Nitrite (As N)	3.903	0.100	4	0	97.6	80 - 120				
Sulfate	19.74	0.500	20	0	98.7	80 - 120				

MS Sample ID: **HS22110582-05MS** Units: **mg/L** Analysis Date: **18-Nov-2022 19:04**
Client ID: **67WW13-221109** Run ID: **ICS-Integrion_422228** SeqNo: **6991425** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1267	0.500	10	1275	-79.9	80 - 120				SEO
Nitrogen, Nitrate (As N)	2.083	0.100	2	0.1144	98.4	80 - 120				
Nitrogen, Nitrite (As N)	1.342	0.100	2	0	67.1	80 - 120				S
Sulfate	291.2	0.500	10	288.2	30.1	80 - 120				SEO

MS Sample ID: **HS22110164-08MS** Units: **mg/L** Analysis Date: **18-Nov-2022 18:01**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991416** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	106.4	1.00	20	87.86	92.8	80 - 120				O
Nitrogen, Nitrate (As N)	4.125	0.200	4	0.1284	99.9	80 - 120				
Nitrogen, Nitrite (As N)	4.001	0.200	4	0.2536	93.7	80 - 120				
Sulfate	39.34	1.00	20	19.27	100	80 - 120				

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422228 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MSD Sample ID: **HS22110582-05MSD** Units: **mg/L** Analysis Date: **18-Nov-2022 19:09**
Client ID: **67WW13-221109** Run ID: **ICS-Integrion_422228** SeqNo: **6991426** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1263	0.500	10	1275	-118	80 - 120	1267	0.304	20	SEO
Nitrogen, Nitrate (As N)	2.085	0.100	2	0.1144	98.5	80 - 120	2.083	0.11	20	
Nitrogen, Nitrite (As N)	1.322	0.100	2	0	66.1	80 - 120	1.342	1.47	20	S
Sulfate	290.8	0.500	10	288.2	26.5	80 - 120	291.2	0.126	20	SEO

MSD Sample ID: **HS22110164-08MSD** Units: **mg/L** Analysis Date: **18-Nov-2022 18:06**
Client ID: Run ID: **ICS-Integrion_422228** SeqNo: **6991417** PrepDate: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	106.8	1.00	20	87.86	94.9	80 - 120	106.4	0.403	20	O
Nitrogen, Nitrate (As N)	4.156	0.200	4	0.1284	101	80 - 120	4.125	0.749	20	
Nitrogen, Nitrite (As N)	4.027	0.200	4	0.2536	94.3	80 - 120	4.001	0.653	20	
Sulfate	39.51	1.00	20	19.27	101	80 - 120	39.34	0.414	20	

The following samples were analyzed in this batch: HS22110582-03 HS22110582-04 HS22110582-05

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: HS22110582

QC BATCH REPORT

Batch ID: R422513 (0) **Instrument:** TOC_04 **Method:** TOTAL ORGANIC CARBON - SM5310B-2011

MBLK Sample ID: **MBLK-11222022** Units: **mg/L** Analysis Date: **23-Nov-2022 08:00**
Client ID: Run ID: **TOC_04_422513** SeqNo: **6998232** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	1.00	1.00								U

LCS Sample ID: **LCS-11222022** Units: **mg/L** Analysis Date: **23-Nov-2022 08:14**
Client ID: Run ID: **TOC_04_422513** SeqNo: **6998233** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.19	1.00	10	0	102	85 - 115				

LCSD Sample ID: **LCSD-11222022** Units: **mg/L** Analysis Date: **23-Nov-2022 08:28**
Client ID: Run ID: **TOC_04_422513** SeqNo: **6998234** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	10.34	1.00	10	0	103	85 - 115	10.19	1.46	20	

MS Sample ID: **HS22110582-05MS** Units: **mg/L** Analysis Date: **23-Nov-2022 10:40**
Client ID: **67WW13-221109** Run ID: **TOC_04_422513** SeqNo: **6998244** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	13.22	1.00	10	2.919	103	80 - 120				

The following samples were analyzed in this batch: HS22110582-03 HS22110582-04 HS22110582-05

Revision: 1

ALS Houston, US Date: 07-Feb-23

Client: Aptim Environmental & Infrastucture, Inc.
Project: LHAAP 67 November 2022
WorkOrder: **HS22110582**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

ALS Houston, US Date: 07-Feb-23

Sample Receipt Checklist

Work Order ID: HS22110582 **Date/Time Received:** 10-Nov-2022 09:00

Client Name: CBI-Houston **Received by:** Corey Grandits

Completed By: /S/ Nelson D. Dusara (eSignature) 10-Nov-2022 11:09 (Date/Time) **Reviewed by:** /S/ Dane J. Wacasey (eSignature) 21-Nov-2022 10:41 (Date/Time)

Matrices: WATER Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8/1.3 C UC/C	IR 31	
Cooler(s)/Kit(s):	47194		
Date/Time sample(s) sent to storage:	11/10/2022 10:30		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 575-2190 ATTN: Dane Wacasey

Project: APTIM LONGHORN
ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. 501032

Job: **LHAAP 67 November 2022**

Prepared By: Scott Beesinger

P.O. Number

HS22110582

Aptim Environmental & Infrastucture, Inc.
LHAAP 67 November 2022

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC by SW 8260B	TOC by SM5310C	MEE by RSK 175	Anions (chloride sulfate, nitrate) by SW9056	CO2 by RSK 175	Remarks (Preservatives, etc.)	Lab I.D.#
67ww09A-221109	wG	11/9/22 0710		3	X						
67ww10-221109	wG	11/9/22 0755		3	X						
67ww08-221109	wG	11/9/22 0840		12	X	X	X	X	X		
67ww08-221109-FD	wG	11/9/22 0840		12	X	X	X	X	X		
67ww13-221109	wG	11/9/22 0935		12	X	X	X	X	X		
67ww13-221109-ms	wG	11/9/22 0935		12	X	X	X	X	X		
67ww13-221109-msD	wG	11/9/22 0935		12	X	X	X	X	X		
TRIP BLANK-221109	wG	11/9/22		2	X						

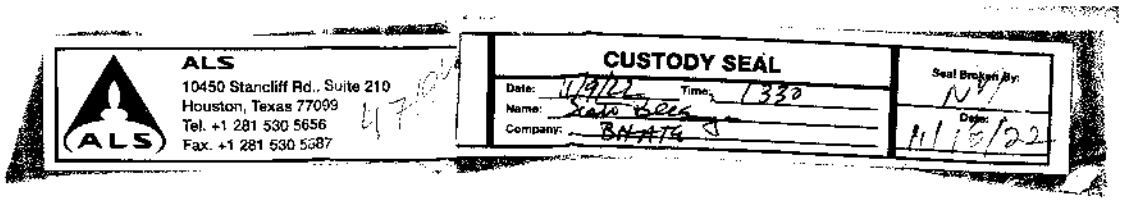
Additional Remarks: **Standard TAT on all parameters. Please email results to Vicki.Graves@aptim.com and invoices to fedinvoices@aptim.com**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger											

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

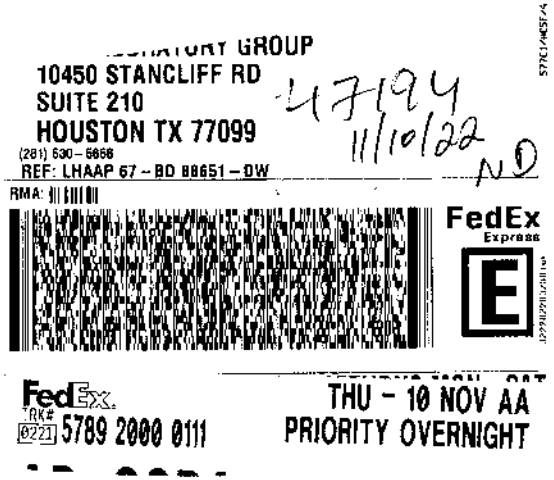


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

47194

CUSTODY SEAL
Date: 11/9/22 Time: 1330
Name: Kate Bees
Company: BHATE J

Seal Broken By: NP
Date: 11/10/22



...ORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 67 - BD 88651 - DW

47194
11/10/22
ND

RMA:

FedEx Express

FedEx
TRK# 0221 5789 2000 0111

THU - 10 NOV AA
PRIORITY OVERNIGHT

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Dane Wacasey
ALS Group USA, Corp
10450 Stancliff Rd.
Suite 210
Houston Texas 77099

Generated 11/18/2022 11:57:45 AM

JOB DESCRIPTION

HS22110582

JOB NUMBER

410-105413-1

Client: ALS Group USA, Corp
Project/Site: HS22110582

Laboratory Job ID: 410-105413-1

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Definitions/Glossary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Qualifiers

GC VOA

Qualifier	Qualifier Description
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Job ID: 410-105413-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-105413-1

Receipt

The samples were received on 11/11/2022 10:10 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.3°C

GC VOA

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Client Sample ID: HS22110582-03 — Lab Sample ID: 410-105413-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	81000		12000	2600	ug/L	1		RSK-175	Total/NA

Client Sample ID: HS22110582-04 — Lab Sample ID: 410-105413-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	90000		12000	2600	ug/L	1		RSK-175	Total/NA

Client Sample ID: HS22110582-05 — Lab Sample ID: 410-105413-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Carbon dioxide	80000	J1	12000	2600	ug/L	1		RSK-175	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Client Sample ID: HS22110582-03

Lab Sample ID: 410-105413-1

Date Collected: 11/09/22 08:40
Matrix: Water
Date Received: 11/11/22 10:10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	81000		12000	2600	ug/L		11/17/22 05:48	11/17/22 09:46	1

Client Sample ID: HS22110582-04

Lab Sample ID: 410-105413-2

Date Collected: 11/09/22 08:40
Matrix: Water
Date Received: 11/11/22 10:10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	90000		12000	2600	ug/L		11/17/22 05:48	11/17/22 09:54	1

Client Sample ID: HS22110582-05

Lab Sample ID: 410-105413-3

Date Collected: 11/09/22 07:10
Matrix: Water
Date Received: 11/11/22 10:10

Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	80000	J1	12000	2600	ug/L		11/17/22 05:48	11/17/22 10:02	1

QC Sample Results

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Method: RSK-175 - Dissolved Gases (GC)

Lab Sample ID: MB 410-318466/1-A
Matrix: Water
Analysis Batch: 318495

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 318466

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon dioxide	2600	U	12000	2600	ug/L		11/17/22 05:48	11/17/22 09:24	1

Lab Sample ID: LCS 410-318466/2-A
Matrix: Water
Analysis Batch: 318495

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 318466

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Carbon dioxide	35800	38200		ug/L		107	80 - 122

Lab Sample ID: 410-105413-3 MS
Matrix: Water
Analysis Batch: 318495

Client Sample ID: HS22110582-05
Prep Type: Total/NA
Prep Batch: 318466

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Carbon dioxide	80000	J1	35800	108000	J1	ug/L		77	80 - 122

Lab Sample ID: 410-105413-3 MSD
Matrix: Water
Analysis Batch: 318495

Client Sample ID: HS22110582-05
Prep Type: Total/NA
Prep Batch: 318466

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Carbon dioxide	80000	J1	35800	121000		ug/L		113	80 - 122	11	30

QC Association Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

GC VOA

Prep Batch: 318466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-105413-1	HS22110582-03	Total/NA	Water	RSK-175	
410-105413-2	HS22110582-04	Total/NA	Water	RSK-175	
410-105413-3	HS22110582-05	Total/NA	Water	RSK-175	
MB 410-318466/1-A	Method Blank	Total/NA	Water	RSK-175	
LCS 410-318466/2-A	Lab Control Sample	Total/NA	Water	RSK-175	
410-105413-3 MS	HS22110582-05	Total/NA	Water	RSK-175	
410-105413-3 MSD	HS22110582-05	Total/NA	Water	RSK-175	

Analysis Batch: 318495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-105413-1	HS22110582-03	Total/NA	Water	RSK-175	318466
410-105413-2	HS22110582-04	Total/NA	Water	RSK-175	318466
410-105413-3	HS22110582-05	Total/NA	Water	RSK-175	318466
MB 410-318466/1-A	Method Blank	Total/NA	Water	RSK-175	318466
LCS 410-318466/2-A	Lab Control Sample	Total/NA	Water	RSK-175	318466
410-105413-3 MS	HS22110582-05	Total/NA	Water	RSK-175	318466
410-105413-3 MSD	HS22110582-05	Total/NA	Water	RSK-175	318466

Lab Chronicle

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Client Sample ID: HS22110582-03

Lab Sample ID: 410-105413-1

Date Collected: 11/09/22 08:40
Matrix: Water
Date Received: 11/11/22 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	RSK-175			318466	LXF2	ELLE	11/17/22 05:48
Total/NA	Analysis	RSK-175		1	318495	LXF2	ELLE	11/17/22 09:46

Client Sample ID: HS22110582-04

Lab Sample ID: 410-105413-2

Date Collected: 11/09/22 08:40
Matrix: Water
Date Received: 11/11/22 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	RSK-175			318466	LXF2	ELLE	11/17/22 05:48
Total/NA	Analysis	RSK-175		1	318495	LXF2	ELLE	11/17/22 09:54

Client Sample ID: HS22110582-05

Lab Sample ID: 410-105413-3

Date Collected: 11/09/22 07:10
Matrix: Water
Date Received: 11/11/22 10:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	RSK-175			318466	LXF2	ELLE	11/17/22 05:48
Total/NA	Analysis	RSK-175		1	318495	LXF2	ELLE	11/17/22 10:02

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: ALS Group USA, Corp
Job ID: 410-105413-1
Project/Site: HS22110582

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-22

Method Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Method	Method Description	Protocol	Laboratory
RSK-175	Dissolved Gases (GC)	RSK	ELLE
RSK-175	Dissolved Gases Prep	RSK	ELLE

Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique , RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: ALS Group USA, Corp
Project/Site: HS22110582

Job ID: 410-105413-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-105413-1	HS22110582-03	Water	11/09/22 08:40	11/11/22 10:10
410-105413-2	HS22110582-04	Water	11/09/22 08:40	11/11/22 10:10
410-105413-3	HS22110582-05	Water	11/09/22 07:10	11/11/22 10:10

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense **COC ID:** 20312

SUBCONTRACT TO:

Eurofins Lancaster Laboratories Envt Testing
2425 New Holland Pike
Lancaster, PA 17601 **Phone:** +1 717 656 2300

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Dane J. Wacasey
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	Dane.Wacasey@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS22110582
TSR:	Ron Martino

	LAB SAMPLE ID / ANALYSIS REQUESTED	CLIENT SAMPLE ID	MATRIX	COLLECT DATE / DUE DATE
1.	**HS22110582-03**	**67WW08-221109**	**Groundwater**	**09 Nov 2022 08:40**
	RSK - CO2; Level II & IV, LHAAP EQUIS EDD			28 Nov 2022
2.	**HS22110582-04**	**67WW08-221109-FD**	**Water**	**09 Nov 2022 08:40**
	RSK - CO2; Level II & IV, LHAAP EQUIS EDD			28 Nov 2022
3.	**HS22110582-05**	**67WW13-221109**	**Groundwater**	**09 Nov 2022 07:10**
	RSK - CO2; Level II & IV, LHAAP EQUIS EDD			28 Nov 2022

Comments: HS22110582-05 designate as MS/MSD

Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: Corey G Date/Time: 11/10/22 1800

Received By: Date/Time: 11/11/22 1010

Cooler ID(s): Temperature(s):

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Purchase Order

PO: HS22110582

VENDOR:

Eurofins Lancaster Laboratories Envt Testing
2425 New Holland Pike
Lancaster, PA 17601

Phone: +1 717 656 2300

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	Dane J. Wacasey
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	Dane.Wacasey@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	20312
TSR:	Ron Martino

	Item	Catalog No	Unit Price	Quantity	Ext Price
1.	RSK - CO2; Level II & IV, LHAAP EQUIS EDD	NA	$115.25	3	$345.75

Order Total: $345.75

Login Sample Receipt Checklist

Client: ALS Group USA, Corp

Job Number: 410-105413-1

Login Number: 105413
List Number: 1
Creator: McCaskey, Jonathan

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

Eurofins Lancaster Laboratories Environment Testing, LLC

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization

Generated
11/18/2022 11:57:45 AM

Authorized for release by
Kelly Bauer, Project Manager
Kelly.Bauer@et.eurofinsus.com
(717)556-7262

Eurofins Lancaster Laboratories Environment Testing, LLC

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

This report shall not be reproduced except in full, without the written approval of the laboratory.

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HS22110582-MSVOA-SW8260 REV01

ALS WO# HS22110582

right solutions.
right partner.

Form 1

Organic Analysis Data Sheet

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-01				Collected	Received	Matrix	Basis
67WW09A-221109				11/09/22 07:10	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-01				Collected	Received	Matrix	Basis
67WW09A-221109				11/09/22 07:10	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 17:34	VOA9_422102	U111721
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:34	VOA9_422102	U111721

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-02	Collected	Received	Matrix	Basis
67WW10-221109	11/09/22 07:55	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-02				Collected	Received	Matrix	Basis
67WW10-221109				11/09/22 07:55	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 17:56	VOA9_422102	U111722
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 17:56	VOA9_422102	U111722

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-03

67WW08-221109

Collected	Received	Matrix	Basis
11/09/22 08:40	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,1-Dichloroethane	ug/L	5.3		0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,1-Dichloroethene	ug/L	19		0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,2-Dichloroethane	ug/L	0.61	J	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-03				Collected	Received	Matrix	Basis
67WW08-221109				11/09/22 08:40	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 13:06	VOA9_422102	U111709
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:06	VOA9_422102	U111709

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-04				Collected	Received	Matrix	Basis
67WW08-221109-FD				11/09/22 08:40	11/10/22 09:00	Water	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1-Dichloroethane	ug/L	5.2		0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1-Dichloroethene	ug/L	20		0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-04				Collected	Received	Matrix	Basis
67WW08-221109-FD				11/09/22 08:40	11/10/22 09:00	Water	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 12:44	VOA9_422102	U111708
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:44	VOA9_422102	U111708

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-05

67WW13-221109

Collected	Received	Matrix	Basis
11/09/22 09:35	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,1,2-Trichloroethane	ug/L	4.3		0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,1-Dichloroethane	ug/L	25		0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,1-Dichloroethene	ug/L	480		2.0	10	10	10	11/17/22 16:05	VOA9_422102	U111717
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,2-Dichloroethane	ug/L	34		0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
cis-1,2-Dichloroethene	ug/L	1.2		0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by EPA 8260

HS22110582-05

67WW13-221109

Collected	Received	Matrix	Basis
11/09/22 09:35	11/10/22 09:00	Groundwater	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 13:29	VOA9_422102	U111710
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Trichloroethene	ug/L	2.1		0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 13:29	VOA9_422102	U111710

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-06	Collected	Received	Matrix	Basis
Trip Blank-221109	11/09/22 07:10	11/10/22 09:00	Water	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

HS22110582-06

Trip Blank-221109

Collected	Received	Matrix	Basis
11/09/22 07:10	11/10/22 09:00	Water	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 16:27	VOA9_422102	U111718
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 16:27	VOA9_422102	U111718

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

VBLKW-221117	Collected	Received	Matrix	Basis
VBLKW-221117	NA	NA	Aqueous	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
1,1,1,2-Tetrachloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1,1-Trichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1,2,2-Tetrachloroethane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1,2-Trichlor-1,2,2-	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1,2-Trichloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,1-Dichloropropene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2,3-Trichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2,3-Trichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2,4-Trichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2,4-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2-Dibromo-3-	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2-Dibromoethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2-Dichlorobenzene	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2-Dichloroethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,2-Dichloropropane	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,3,5-Trimethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,3-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,3-Dichloropropane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
1,4-Dichlorobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
2,2-Dichloropropane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
2-Butanone	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
2-Chlorotoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
2-Hexanone	ug/L	2.0	U	1.0	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
4-Chlorotoluene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
4-Isopropyltoluene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
4-Methyl-2-pentanone	ug/L	2.0	U	0.70	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
Acetone	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
Benzene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Bromobenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Bromochloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Bromodichloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

Volatiles by EPA 8260

VBLKW-221117	Collected	Received	Matrix	Basis
VBLKW-221117	NA	NA	Aqueous	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Bromoform	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Bromomethane	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Carbon disulfide	ug/L	2.0	U	0.60	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
Carbon tetrachloride	ug/L	1.0	U	0.50	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Chlorobenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Chloroethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Chloroform	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Chloromethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
cis-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
cis-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Cyclohexane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Dibromochloromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Dibromomethane	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Dichlorodifluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Ethylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Hexachlorobutadiene	ug/L	1.0	U	1.0	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Isopropylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
m,p-Xylene	ug/L	2.0	U	0.50	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
Methyl acetate	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Methyl tert-butyl ether	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Methylcyclohexane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Methylene chloride	ug/L	2.0	U	0.40	2.0	2.0	1	11/17/22 12:22	VOA9_422102	U111707
Naphthalene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
n-Butylbenzene	ug/L	1.0	U	0.40	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
n-Propylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
o-Xylene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
sec-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Styrene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
tert-Butylbenzene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Tetrachloroethene	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Toluene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
trans-1,2-Dichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
trans-1,3-Dichloropropene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707

Form 1 - Organic Analysis Data Sheet

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by EPA 8260

VBLKW-221117	Collected	Received	Matrix	Basis
VBLKW-221117	NA	NA	Aqueous	Wet

Analyte	Units	Result	Q	DL	LOD	LOQ	DF	Analysis Date	Run ID	DataFile
Trichloroethene	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Trichlorofluoromethane	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Vinyl chloride	ug/L	1.0	U	0.20	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707
Xylenes, Total	ug/L	1.0	U	0.30	1.0	1.0	1	11/17/22 12:22	VOA9_422102	U111707

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Form 2

System Monitoring Compound Recovery

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
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Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_422102

Volatiles by by EPA 8260

CCV	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	52.62	50	105	80-120	
4-Bromofluorobenzene	52.58	50	105	80-120	
Dibromofluoromethane	53.99	50	108	80-120	
Toluene-d8	52.94	50	106	80-120	

CCB	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	44.78	50	89.6	80-120	
4-Bromofluorobenzene	48.36	50	96.7	80-120	
Dibromofluoromethane	44.59	50	89.2	80-120	
Toluene-d8	53.44	50	107	80-120	

VLCSW-221117	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	51.54	50	103	81-118	
4-Bromofluorobenzene	51.48	50	103	85-114	
Dibromofluoromethane	52.39	50	105	80-119	
Toluene-d8	52.05	50	104	89-112	

VBLKW-221117	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	45.61	50	91.2	81-118	
4-Bromofluorobenzene	48.11	50	96.2	85-114	
Dibromofluoromethane	45.25	50	90.5	80-119	
Toluene-d8	54.69	50	109	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_422102

Volatiles by by EPA 8260

HS22110582-04	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	47	50	93.5	81-118	
4-Bromofluorobenzene	48	50	95.4	85-114	
Dibromofluoromethane	46	50	91.9	80-119	
Toluene-d8	54	50	109	89-112	

HS22110582-03	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	47	50	93.1	81-118	
4-Bromofluorobenzene	47	50	94.8	85-114	
Dibromofluoromethane	46	50	91.5	80-119	
Toluene-d8	55	50	110	89-112	

HS22110582-05	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	46	50	91.8	81-118	
4-Bromofluorobenzene	48	50	96.0	85-114	
Dibromofluoromethane	46	50	92.3	80-119	
Toluene-d8	54	50	108	89-112	
1,2-Dichloroethane-d4	460	500	92.2	81-118	
4-Bromofluorobenzene	480	500	96.0	85-114	
Dibromofluoromethane	450	500	90.6	80-119	
Toluene-d8	540	500	109	89-112	

HS22110582-05MS	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	44.22	50	88.4	81-118	
4-Bromofluorobenzene	51.8	50	104	85-114	
Dibromofluoromethane	45.99	50	92.0	80-119	
Toluene-d8	55.01	50	110	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_422102

Volatiles by by EPA 8260

HS22110582-05MSD	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	45.08	50	90.2	81-118	
4-Bromofluorobenzene	51.84	50	104	85-114	
Dibromofluoromethane	46.98	50	94.0	80-119	
Toluene-d8	54.04	50	108	89-112	

HS22110859-03MS	Analyzed 11/17/22		Conc Units µg/L		DF 500
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	22520	25000	90.1	81-118	
4-Bromofluorobenzene	25900	25000	104	85-114	
Dibromofluoromethane	23460	25000	93.9	80-119	
Toluene-d8	27440	25000	110	89-112	

HS22110859-03MSD	Analyzed 11/17/22		Conc Units µg/L		DF 500
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	22470	25000	89.9	81-118	
4-Bromofluorobenzene	25860	25000	103	85-114	
Dibromofluoromethane	23020	25000	92.1	80-119	
Toluene-d8	27630	25000	111	89-112	

HS22110582-06	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	47	50	93.4	81-118	
4-Bromofluorobenzene	48	50	96.3	85-114	
Dibromofluoromethane	46	50	91.8	80-119	
Toluene-d8	55	50	110	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

Form 2 - System Monitoring Compound Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_422102

Volatiles by by EPA 8260

HS22110582-01	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	47	50	93.3	81-118	
4-Bromofluorobenzene	47	50	93.5	85-114	
Dibromofluoromethane	46	50	91.4	80-119	
Toluene-d8	54	50	108	89-112	

HS22110582-02	Analyzed 11/17/22		Conc Units µg/L		DF 1
Surrogate	Result Conc	Spike Conc	%Recovery	%Recovery Limits	Q
1,2-Dichloroethane-d4	47	50	93.4	81-118	
4-Bromofluorobenzene	46	50	92.8	85-114	
Dibromofluoromethane	46	50	91.9	80-119	
Toluene-d8	54	50	107	89-112	

Q - Surrogate %Recovery Flag * - %Recovery / RPD Outside Limits

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Form 3A

Matrix Spike/Spike Duplicate Recovery

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

02/07/2023

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Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

67WW13-221109			HS22110582-05	HS22110582-05MS				HS22110582-05MSD						
Sample Matrix	Aqueous	Run Date	11/17/22	11/17/22				11/17/22						
Units	µg/L	Run Time	13:29	14:36				14:58						
		Data File	U111710.D	U111713.D				U111714.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
1,1,1,2-Tetrachloroethane	78-124	1	0	23.47	20.00	117		21.95	20.00	110		20	6.70	
1,1,1-Trichloroethane	74-131	1	0	23.31	20.00	117		22.91	20.00	115		20	1.70	
1,1,2,2-Tetrachloroethane	71-121	1	0	22.34	20.00	112		21.1	20.00	106		20	5.70	
1,1,2-Trichlor-1,2,2-	70-136	1	0	33.52	20.00	168	*	31.57	20.00	158	*	20	6.00	
1,1,2-Trichloroethane	80-119	1	4.336	26.96	20.00	113		25.21	20.00	104		20	6.70	
1,1-Dichloroethane	77-125	1	24.96	44.39	20.00	97		43.57	20.00	93		20	1.90	
1,1-Dichloroethene	71-131	1	548.4	554.6	20.00	31	*	546.2	20.00	-11	*	20	1.50	
1,1-Dichloropropene	78-125	1	0	26.79	20.00	134	*	25.33	20.00	127	*	20	5.60	
1,2,3-Trichlorobenzene	69-129	1	0	20.45	20.00	102		21.33	20.00	107		20	4.20	
1,2,3-Trichloropropane	73-122	1	0	21.77	20.00	109		20.5	20.00	102		20	6.00	
1,2,4-Trichlorobenzene	69-130	1	0	20.80	20.00	104		21.57	20.00	108		20	3.60	
1,2,4-Trimethylbenzene	76-124	1	0	25.62	20.00	128	*	24.94	20.00	125	*	20	2.70	
1,2-Dibromo-3-	62-128	1	0	17.60	20.00	88		16.93	20.00	85		20	3.90	
1,2-Dibromoethane	77-121	1	0	22.34	20.00	112		21.89	20.00	109		20	2.10	
1,2-Dichlorobenzene	80-119	1	0	22.83	20.00	114		22.08	20.00	110		20	3.30	
1,2-Dichloroethane	73-128	1	33.95	56.32	20.00	112		54.59	20.00	103		20	3.10	
1,2-Dichloropropane	78-122	1	0	22.64	20.00	113		21.8	20.00	109		20	3.80	
1,3,5-Trimethylbenzene	75-124	1	0	27.02	20.00	135	*	26.03	20.00	130	*	20	3.70	
1,3-Dichlorobenzene	80-119	1	0	24.03	20.00	120	*	23.58	20.00	118		20	1.90	
1,3-Dichloropropane	80-119	1	0	22.73	20.00	114		21.86	20.00	109		20	3.90	
1,4-Dichlorobenzene	79-118	1	0	22.23	20.00	111		21.83	20.00	109		20	1.80	
2,2-Dichloropropane	60-139	1	0	20.77	20.00	104		19.91	20.00	100		20	4.20	
2-Butanone	56-143	1	0	36.37	40.00	91		35.34	40.00	88		20	2.90	
2-Chlorotoluene	79-122	1	0	25.66	20.00	128	*	24.85	20.00	124	*	20	3.20	
2-Hexanone	57-139	1	0	38.58	40.00	97		37.29	40.00	93		20	3.40	
4-Chlorotoluene	78-122	1	0	25.55	20.00	128	*	24.28	20.00	121		20	5.10	
4-Isopropyltoluene	77-127	1	0	26.79	20.00	134	*	25.74	20.00	129	*	20	4.00	
4-Methyl-2-pentanone	67-130	1	0	43.63	40.00	109		41.31	40.00	103		20	5.40	
Acetone	39-160	1	0	25.37	40.00	63		23.25	40.00	58		20	8.70	
Benzene	79-120	1	0	23.37	20.00	117		22.44	20.00	112		20	4.10	
Bromobenzene	80-120	1	0	23.82	20.00	119		22.91	20.00	115		20	3.90	
Bromochloromethane	78-123	1	0	19.17	20.00	96		18.56	20.00	93		20	3.30	
Bromodichloromethane	79-125	1	0	21.77	20.00	109		20.84	20.00	104		20	4.40	
Bromoform	66-130	1	0	17.73	20.00	89		17.05	20.00	85		20	3.90	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

67WW13-221109		HS22110582-05		HS22110582-05MS				HS22110582-05MSD						
Sample Matrix Aqueous		**Run Date**	11/17/22	11/17/22				11/17/22						
Units µg/L		**Run Time**	13:29	14:36				14:58						
		Data File	U111710.D	U111713.D				U111714.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
Bromomethane	53-141	1	0	20.30	20.00	102		19.15	20.00	96		20	5.80	
Carbon disulfide	64-133	1	0	38.82	40.00	97		38.08	40.00	95		20	1.90	
Carbon tetrachloride	72-136	1	0	31.48	20.00	157	*	30	20.00	150	*	20	4.80	
Chlorobenzene	82-118	1	0	23.40	20.00	117		22.63	20.00	113		20	3.40	
Chloroethane	60-138	1	0	20.06	20.00	100		19.59	20.00	98		20	2.30	
Chloroform	79-124	1	0	20.90	20.00	105		20.4	20.00	102		20	2.40	
Chloromethane	50-139	1	0	19.49	20.00	98		19	20.00	95		20	2.60	
cis-1,2-Dichloroethene	78-123	1	1.231	21.48	20.00	101		20.83	20.00	98		20	3.10	
cis-1,3-Dichloropropene	75-124	1	0	18.70	20.00	94		18.01	20.00	90		20	3.80	
Dibromochloromethane	74-126	1	0	19.39	20.00	97		18.66	20.00	93		20	3.80	
Dibromomethane	79-123	1	0	21.31	20.00	107		20.55	20.00	103		20	3.60	
Dichlorodifluoromethane	32-152	1	0	20.71	20.00	104		20.12	20.00	101		20	2.90	
Ethylbenzene	79-121	1	0	25.48	20.00	127	*	24.24	20.00	121	*	20	5.00	
Hexachlorobutadiene	66-134	1	0	31.61	20.00	158	*	30.11	20.00	151	*	20	4.90	
Isopropylbenzene	72-131	1	0	26.93	20.00	135	*	25.91	20.00	130		20	3.90	
m,p-Xylene	80-121	1	0	48.96	40.00	122	*	47.82	40.00	120		20	2.40	
Methylene chloride	74-124	1	0	19.70	20.00	99		19.11	20.00	96		20	3.00	
n-Butylbenzene	75-128	1	0	26.10	20.00	131	*	26.11	20.00	131	*	20	0	
n-Propylbenzene	76-126	1	0	26.62	20.00	133	*	25.98	20.00	130	*	20	2.40	
Naphthalene	61-128	1	0	18.17	20.00	91		19.93	20.00	100		20	9.20	
o-Xylene	78-122	1	0	24.45	20.00	122	*	23.56	20.00	118		20	3.70	
sec-Butylbenzene	77-126	1	0	25.93	20.00	130	*	25.32	20.00	127	*	20	2.40	
Styrene	78-123	1	0	20.47	20.00	102		19.65	20.00	98		20	4.10	
tert-Butylbenzene	78-124	1	0	27.11	20.00	136	*	26.29	20.00	131	*	20	3.10	
Tetrachloroethene	74-129	1	0	27.80	20.00	139	*	25.63	20.00	128		20	8.10	
Toluene	80-121	1	0	25.57	20.00	128	*	24.11	20.00	121		20	5.90	
trans-1,2-Dichloroethene	75-124	1	0	20.79	20.00	104		20.67	20.00	103		20	0.600	
trans-1,3-Dichloropropene	73-127	1	0	17.11	20.00	86		16.83	20.00	84		20	1.70	
Trichloroethene	79-123	1	2.116	27.86	20.00	129	*	25.5	20.00	117		20	8.80	
Trichlorofluoromethane	65-141	1	0	22.55	20.00	113		22.17	20.00	111		20	1.70	
Vinyl chloride	58-137	1	0	21.09	20.00	105		20.61	20.00	103		20	2.30	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

		HS22110859-03		HS22110859-03MS				HS22110859-03MSD						
Sample Matrix	Aqueous	**Run Date**	11/17/22	11/17/22				11/17/22						
Units	µg/L	**Run Time**	13:51	15:20				15:42						
		Data File	U111711.D	U111715.D				U111716.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
1,1,1,2-Tetrachloroethane	78-124	500	0	11310	10000	113		11080	10000	111		20	2.00	
1,1,1-Trichloroethane	74-131	500	0	11460	10000	115		10910	10000	109		20	4.90	
1,1,2,2-Tetrachloroethane	71-121	500	0	10560	10000	106		10670	10000	107		20	1.10	
1,1,2-Trichlor-1,2,2-	70-136	500	31320	40600	10000	93		38800	10000	75		20	4.50	
1,1,2-Trichloroethane	80-119	500	0	10860	10000	109		10500	10000	105		20	3.30	
1,1-Dichloroethane	77-125	500	0	9665	10000	97		9313	10000	93		20	3.70	
1,1-Dichloroethene	71-131	500	0	10820	10000	108		10080	10000	101		20	7.10	
1,1-Dichloropropene	78-125	500	0	12810	10000	128	*	12020	10000	120		20	6.30	
1,2,3-Trichlorobenzene	69-129	500	0	10960	10000	110		10990	10000	110		20	0.200	
1,2,3-Trichloropropane	73-122	500	0	9852	10000	99		10270	10000	103		20	4.10	
1,2,4-Trichlorobenzene	69-130	500	0	11000	10000	110		10980	10000	110		20	0.200	
1,2,4-Trimethylbenzene	76-124	500	0	12420	10000	124	*	12440	10000	124	*	20	0.200	
1,2-Dibromo-3-	62-128	500	0	8398	10000	84		8536	10000	85		20	1.60	
1,2-Dibromoethane	77-121	500	0	10730	10000	107		10690	10000	107		20	0.400	
1,2-Dichlorobenzene	80-119	500	0	11020	10000	110		10580	10000	106		20	4.00	
1,2-Dichloroethane	73-128	500	0	10370	10000	104		10270	10000	103		20	1.00	
1,2-Dichloropropane	78-122	500	0	10930	10000	109		10610	10000	106		20	2.90	
1,3,5-Trimethylbenzene	75-124	500	0	12930	10000	129	*	12580	10000	126	*	20	2.70	
1,3-Dichlorobenzene	80-119	500	0	11640	10000	116		11280	10000	113		20	3.20	
1,3-Dichloropropane	80-119	500	0	10950	10000	110		10810	10000	108		20	1.30	
1,4-Dichlorobenzene	79-118	500	0	10970	10000	110		10640	10000	106		20	3.00	
2,2-Dichloropropane	60-139	500	0	10100	10000	101		9741	10000	97		20	3.70	
2-Butanone	56-143	500	1809	18990	20000	86		19310	20000	88		20	1.70	
2-Chlorotoluene	79-122	500	0	12390	10000	124	*	12190	10000	122		20	1.60	
2-Hexanone	57-139	500	0	18430	20000	92		18340	20000	92		20	0.500	
4-Chlorotoluene	78-122	500	0	12160	10000	122		11960	10000	120		20	1.60	
4-Isopropyltoluene	77-127	500	0	12950	10000	130	*	12690	10000	127		20	2.10	
4-Methyl-2-pentanone	67-130	500	0	19890	20000	100		20350	20000	102		20	2.30	
Acetone	39-160	500	0	12770	20000	64		13720	20000	69		20	7.20	
Benzene	79-120	500	0	10980	10000	110		10680	10000	107		20	2.90	
Bromobenzene	80-120	500	0	11450	10000	115		11130	10000	111		20	2.80	
Bromochloromethane	78-123	500	0	9330	10000	93		9317	10000	93		20	0.100	
Bromodichloromethane	79-125	500	0	10480	10000	105		9942	10000	99		20	5.30	
Bromoform	66-130	500	0	8643	10000	86		8688	10000	87		20	0.500	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

Form 3A - Matrix Spike/Spike Duplicate Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder **HS22110582**

		HS22110859-03		HS22110859-03MS				HS22110859-03MSD						
Sample Matrix	Aqueous	**Run Date**	11/17/22	11/17/22				11/17/22						
Units	µg/L	**Run Time**	13:51	15:20				15:42						
		Data File	U111711.D	U111715.D				U111716.D						
Analyte	%R Limits	DF	Result	MS Result	Spike Added	%R	Q	MSD Result	Spike Added	%R	Q	RPD Limit	RPD	Q
Bromomethane	53-141	500	0	9707	10000	97		9100	10000	91		20	6.50	
Carbon disulfide	64-133	500	0	19190	20000	96		18350	20000	92		20	4.40	
Carbon tetrachloride	72-136	500	0	14940	10000	149	*	14350	10000	143	*	20	4.00	
Chlorobenzene	82-118	500	0	11260	10000	113		11020	10000	110		20	2.10	
Chloroethane	60-138	500	0	9810	10000	98		9646	10000	97		20	1.70	
Chloroform	79-124	500	0	10010	10000	100		9747	10000	98		20	2.70	
Chloromethane	50-139	500	0	9522	10000	95		8910	10000	89		20	6.60	
cis-1,2-Dichloroethene	78-123	500	0	10040	10000	100		9637	10000	96		20	4.10	
cis-1,3-Dichloropropene	75-124	500	0	9184	10000	92		8960	10000	90		20	2.50	
Dibromochloromethane	74-126	500	0	9496	10000	95		9456	10000	95		20	0.400	
Dibromomethane	79-123	500	0	10210	10000	102		9930	10000	99		20	2.80	
Dichlorodifluoromethane	32-152	500	0	9816	10000	98		9387	10000	94		20	4.50	
Ethylbenzene	79-121	500	0	12230	10000	122	*	11930	10000	119		20	2.50	
Hexachlorobutadiene	66-134	500	0	14410	10000	144	*	13960	10000	140	*	20	3.10	
Isopropylbenzene	72-131	500	0	13240	10000	132	*	12750	10000	128		20	3.80	
m,p-Xylene	80-121	500	0	24170	20000	121		23670	20000	118		20	2.10	
Methylene chloride	74-124	500	0	9707	10000	97		9458	10000	95		20	2.60	
n-Butylbenzene	75-128	500	0	12830	10000	128	*	12650	10000	127		20	1.40	
n-Propylbenzene	76-126	500	0	12830	10000	128	*	12720	10000	127	*	20	0.800	
Naphthalene	61-128	500	0	10090	10000	101		10320	10000	103		20	2.20	
o-Xylene	78-122	500	0	11930	10000	119		11470	10000	115		20	4.00	
sec-Butylbenzene	77-126	500	0	12430	10000	124		12290	10000	123		20	1.10	
Styrene	78-123	500	0	10510	10000	105		10340	10000	103		20	1.60	
tert-Butylbenzene	78-124	500	0	12920	10000	129	*	12710	10000	127	*	20	1.70	
Tetrachloroethene	74-129	500	10420	23480	10000	131	*	22140	10000	117		20	5.90	
Toluene	80-121	500	0	12390	10000	124	*	11980	10000	120		20	3.40	
trans-1,2-Dichloroethene	75-124	500	0	10200	10000	102		9611	10000	96		20	5.90	
trans-1,3-Dichloropropene	73-127	500	0	8528	10000	85		8565	10000	86		20	0.400	
Trichloroethene	79-123	500	29470	40720	10000	113		38890	10000	94		20	4.60	
Trichlorofluoromethane	65-141	500	0	11180	10000	112		10780	10000	108		20	3.70	
Vinyl chloride	58-137	500	0	10120	10000	101		9718	10000	97		20	4.10	

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits OL - Outside Limits

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Form 3B

Laboratory Control Sample Recovery

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

02/07/2023

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 3B - Laboratory Control Sample Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by EPA 8260

VOA9_422102		QC ID	VLCSW-221117			
QC Matrix Aqueous	Units	Run Date	11/17/22			
	ug/L	Run Time	11:37			
Analyte	%R Limits	Spike Added	LCS Result	%R	Q	
1,1,1,2-Tetrachloroethane	78-124	20	20.99	105		
1,1,1-Trichloroethane	74-131	20	20.17	101		
1,1,2,2-Tetrachloroethane	71-121	20	20.59	103		
1,1,2-Trichlor-1,2,2-trifluoroethane	70-136	20	22.77	114		
1,1,2-Trichloroethane	80-119	20	20.96	105		
1,1-Dichloroethane	77-125	20	19.18	96		
1,1-Dichloroethene	71-131	20	19.29	96		
1,1-Dichloropropene	78-125	20	20.08	100		
1,2,3-Trichlorobenzene	69-129	20	19.45	97		
1,2,3-Trichloropropane	73-122	20	20.49	102		
1,2,4-Trichlorobenzene	69-130	20	18.41	92		
1,2,4-Trimethylbenzene	76-124	20	21.31	107		
1,2-Dibromo-3-chloropropane	62-128	20	16.8	84		
1,2-Dibromoethane	77-121	20	21.16	106		
1,2-Dichlorobenzene	80-119	20	20.12	101		
1,2-Dichloroethane	73-128	20	20.82	104		
1,2-Dichloroethane-d4	81-118	50	51.54	103		
1,2-Dichloropropane	78-122	20	21.13	106		
1,3,5-Trimethylbenzene	75-124	20	21.04	105		
1,3-Dichlorobenzene	80-119	20	20.82	104		
1,3-Dichloropropane	80-119	20	21.46	107		
1,4-Dichlorobenzene	79-118	20	19.78	99		
2,2-Dichloropropane	60-139	20	18.54	93		
2-Butanone	56-143	40	46.41	116		
2-Chlorotoluene	79-122	20	21.13	106		
2-Hexanone	57-139	40	38.36	96		
4-Bromofluorobenzene	85-114	50	51.48	103		
4-Chlorotoluene	78-122	20	21.04	105		
4-Isopropyltoluene	77-127	20	19.1	96		
4-Methyl-2-pentanone	67-130	40	40.16	100		
Acetone	39-160	40	43.83	110		
Benzene	79-120	20	20.67	103		
Bromobenzene	80-120	20	21.34	107		
Bromochloromethane	78-123	20	20.04	100		
Bromodichloromethane	79-125	20	20.2	101		
Bromoform	66-130	20	16.95	85		

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits

Form 3B - Laboratory Control Sample Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by EPA 8260

VOA9_422102		QC ID	VLCSW-221117			
QC Matrix Aqueous	Units	Run Date	11/17/22			
	ug/L	Run Time	11:37			
Analyte	%R Limits	Spike Added	LCS Result	%R	Q	
Bromomethane	53-141	20	19.75	99		
Carbon disulfide	64-133	40	36.1	90		
Carbon tetrachloride	72-136	20	23.63	118		
Chlorobenzene	82-118	20	20.46	102		
Chloroethane	60-138	20	18.93	95		
Chloroform	79-124	20	20.14	101		
Chloromethane	50-139	20	19.51	98		
cis-1,2-Dichloroethene	78-123	20	20.2	101		
cis-1,3-Dichloropropene	75-124	20	17.5	88		
Cyclohexane	71-130	20	24.45	122		
Dibromochloromethane	74-126	20	18.58	93		
Dibromofluoromethane	80-119	50	52.39	105		
Dibromomethane	79-123	20	19.77	99		
Dichlorodifluoromethane	32-152	20	19.72	99		
Ethylbenzene	79-121	20	20.34	102		
Hexachlorobutadiene	66-134	20	21.01	105		
Isopropylbenzene	72-131	20	20.1	100		
m,p-Xylene	80-121	40	40.4	101		
Methyl acetate	56-136	20	19.04	95		
Methyl tert-butyl ether	71-124	20	18.58	93		
Methylcyclohexane	72-132	20	19	95		
Methylene chloride	74-124	20	21.45	107		
Naphthalene	61-128	20	18.2	91		
n-Butylbenzene	75-128	20	18.63	93		
n-Propylbenzene	76-126	20	19.65	98		
o-Xylene	78-122	20	20.24	101		
sec-Butylbenzene	77-126	20	18.29	92		
Styrene	78-123	20	19.44	97		
tert-Butylbenzene	78-124	20	19.57	98		
Tetrachloroethene	74-129	20	19.39	97		
Toluene	80-121	20	21.38	107		
Toluene-d8	89-112	50	52.05	104		
trans-1,2-Dichloroethene	75-124	20	19.28	96		
trans-1,3-Dichloropropene	73-127	20	16.86	84		
Trichloroethene	79-123	20	20.17	101		
Trichlorofluoromethane	65-141	20	19.46	97		

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits

Form 3B - Laboratory Control Sample Recovery

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by EPA 8260

VOA9_422102		QC ID	VLCSW-221117			
QC Matrix Aqueous	Units	Run Date	11/17/22			
	ug/L	Run Time	11:37			
Analyte	%R Limits	Spike Added	LCS Result	%R	Q	
Vinyl chloride	58-137	20	19.28	96		
Xylenes	78-122	60	60.65	101		

- %Recovery / RPD Flag * - %Recovery / RPD Outside Limits

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Form 4

Method Blank Summary

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

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Form 4 - Method Blank Summary

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by by EPA 8260

Client Sample ID	Type	Lab Sample ID	File ID	Date Analyzed	Run ID
METHOD BLANK	MBLK	VBLKW-221117	U111707.D	11/17/22 12:22	VOA9_422102
VLCSW-221117	LCS	VLCSW-221117	U111705.D	11/17/22 11:37	VOA9_422102
67WW08-221109-FD	SAMP	HS22110582-04	U111708.D	11/17/22 12:44	VOA9_422102
67WW08-221109	SAMP	HS22110582-03	U111709.D	11/17/22 13:06	VOA9_422102
67WW13-221109	SAMP	HS22110582-05	U111710.D	11/17/22 13:29	VOA9_422102
67WW13-221109	MS	HS22110582-05MS	U111713.D	11/17/22 14:36	VOA9_422102
67WW13-221109	MSD	HS22110582-05MSD	U111714.D	11/17/22 14:58	VOA9_422102
BatchQC	MS	HS22110859-03MS	U111715.D	11/17/22 15:20	VOA9_422102
BatchQC	MSD	HS22110859-03MSD	U111716.D	11/17/22 15:42	VOA9_422102
67WW13-221109	SAMP	HS22110582-05	U111717.D	11/17/22 16:05	VOA9_422102
Trip Blank-221109	SAMP	HS22110582-06	U111718.D	11/17/22 16:27	VOA9_422102
67WW09A-221109	SAMP	HS22110582-01	U111721.D	11/17/22 17:34	VOA9_422102
67WW10-221109	SAMP	HS22110582-02	U111722.D	11/17/22 17:56	VOA9_422102

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Form 5

Instrument Performance Check

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
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www.alsglobal.com

Form 5 - Instrument Performance Check

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_421678

Tune File U111101.D 11/11/22 11:34

m / e	Ion Abundance Criterion	%RA
50	15.0 - 40.0% of mass 95	18.5 (18.5)
75	30.0 - 60.0% of mass 95	50.1 (50.1)
95	Base peak, 100% RA	100 (100)
96	5.0 - 9.0% of mass 95	7.1 (7.12)
173	Less than 2.0% of mass 174	0 (0) 1
174	50.0 - 120.0% of mass 95	91.9 (91.9)
175	4.0 - 9.0% of mass 174	8.1 (8.83) 1
176	93.0 - 101.0% of mass 174	89.1 (97) 1
177	5.0 - 9.0% of mass 176	5.8 (6.51) 2

Value is % of mass 1) 174 2) 176 RA - Relative Abundance

This check applies to the following analyses

	Type	Date Analyzed	Lab File ID	Sample ID
1	ICAL1	11/11/22 11:56	U111102	VSTD000.25
2	ICAL2	11/11/22 12:18	U111103	VSTD000.5
3	ICAL3	11/11/22 13:03	U111104	VSTD001
4	ICAL4	11/11/22 13:25	U111105	VSTD002
5	ICAL5	11/11/22 13:47	U111106	VSTD005
6	ICAL6	11/11/22 14:09	U111107	VSTD020
7	ICAL7	11/11/22 14:31	U111108	VSTD050
8	ICAL8	11/11/22 14:53	U111109	VSTD100
9	ICAL9	11/11/22 15:16	U111110	VSTD150
10	ICAL	11/11/22 15:38	U111111	VSTD200
11	ICV	11/11/22 16:44	U111114	CCV

Form 5 - Instrument Performance Check

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_422102

Tune File U111701.D 11/17/22 10:08

m / e	Ion Abundance Criterion	%RA
50	15.0 - 40.0% of mass 95	17.1 (17.1)
75	30.0 - 60.0% of mass 95	46.7 (46.7)
95	Base peak, 100% RA	100 (100)
96	5.0 - 9.0% of mass 95	6.8 (6.84)
173	Less than 2.0% of mass 174	0 (0) 1
174	50.0 - 120.0% of mass 95	82.4 (82.4)
175	4.0 - 9.0% of mass 174	6.6 (8.01) 1
176	93.0 - 101.0% of mass 174	79.2 (96.1) 1
177	5.0 - 9.0% of mass 176	5.3 (6.7) 2

Value is % of mass 1) 174 2) 176 RA - Relative Abundance

This check applies to the following analyses

	Type	Date Analyzed	Lab File ID	Sample ID
1	CCV	11/17/22 10:53	U111703	CCV
2	CCB	11/17/22 11:15	U111704	CCB
3	LCS	11/17/22 11:37	U111705	VLCSW-221117
4	MBLK	11/17/22 12:22	U111707	VBLKW-221117
5	SAMP	11/17/22 12:44	U111708	67WW08-221109-FD
6	SAMP	11/17/22 13:06	U111709	67WW08-221109
7	SAMP	11/17/22 13:29	U111710	67WW13-221109
8	MS	11/17/22 14:36	U111713	HS22110582-05MS
9	MSD	11/17/22 14:58	U111714	HS22110582-05MSD
10	MS	11/17/22 15:20	U111715	ZZZZZZMS
11	MSD	11/17/22 15:42	U111716	ZZZZZZMSD
12	SAMP	11/17/22 16:05	U111717	67WW13-221109
13	SAMP	11/17/22 16:27	U111718	Trip Blank-221109
14	SAMP	11/17/22 17:34	U111721	67WW09A-221109
15	SAMP	11/17/22 17:56	U111722	67WW10-221109
16	CCV_EN	11/17/22 21:39	U111732	CCV-END

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Form 6

Initial Calibration Data

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
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Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_421678

Volatiles Organics by Method 8260C

ICAL Start Date 11-NOV-2022 1156
ICAL End Date 11-NOV-2022 1538

Calibration Files

Level 1 ..voa9.i\U221111.b\U111102.D
Level 2 ..voa9.i\U221111.b\U111103.D
Level 3 ..voa9.i\U221111.b\U111104.D
Level 4 ..voa9.i\U221111.b\U111105.D
Level 5 ..voa9.i\U221111.b\U111106.D
Level 6 ..voa9.i\U221111.b\U111107.D
Level 7 ..voa9.i\U221111.b\U111108.D
Level 8 ..voa9.i\U221111.b\U111109.D
Level 9 ..voa9.i\U221111.b\U111110.D
Level 10 ..voa9.i\U221111.b\U111111.D

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Dichlorodifluoromethane	NE 341105	4110 811364	5077 NE	13794 NE	27052	102320	QUAD	0.00497	2.70999	-0.68802	0.99907	
Chloromethane	NE 443180	5083 920649	9584 1404641	18483 1980029	42615	151074	LINR	0.00497	0.55484		0.99958	
Propionitrile	NE 0.07816	0.07866 0.07852	0.09016 0.07944	0.07629 0.07571	0.08264	0.08029	AVRG		0.07998		5.41628	
Vinyl Chloride	NE 0.50798	0.59832 0.54722	0.48678 0.56417	0.49108 0.52557	0.45681	0.41192	AVRG		0.50998		11.11666	
Bromomethane	NE 297603	3746 575509	7086 870933	14046 1235875	31789	112053	LINR	-0.02231	0.34356		0.99971	
Chloroethane	NE 0.37854	0.44333 0.40669	0.31694 0.39504	0.37296 0.36341	0.35911	0.31712	AVRG		0.37257		10.88063	
Trichlorofluoromethane	NE 0.64539	0.77114 0.75423	0.55006 0.73088	0.70734 0.64030	0.62146	0.54678	AVRG		0.66307		12.55101	
Acrolein	NE 55154	810 117779	1204 185978	2628 257093	6241	19477	LINR	0.01996	0.03620		0.99877	
Acetone	NE 354366	13138 675630	16101 999241	24043 1345589	50255	138833	LINR	-0.15051	0.18958		0.99740	
1,1-Dichloroethene	NE 0.42370	0.50391 0.47515	0.37561 0.46979	0.40906 0.43067	0.38649	0.36338	AVRG		0.42642		11.34935	

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Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
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RunID VOA9_421678

Volatiles Organics by Method 8260C

ICAL Start Date 11-NOV-2022 1156 **ICAL End Date** 11-NOV-2022 1538

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Isobutyl Alcohol	NE 913025	6241 2020674	13495 3236082	27238 4941650	71424	309205	LINR	1.29985	0.06758		0.99681	
Acetonitrile	NE 0.04844	0.04581 0.05248	0.06086 0.05282	0.05273 0.04923	0.04707	0.04784	AVRG		0.05081		9.00444	
Allyl Chloride	NE 1.11129	1.23887 1.16441	1.21521 1.17726	1.18831 1.09891	1.16648	1.10377	AVRG		1.16272		4.26014	
Iodomethane	NE 724437	7282 1610926	11703 2556299	22375 3486199	51771	213421	QUAD	0.08012	1.99245	0.00469	0.99773	
Acrylonitrile	NE 0.22209	0.24684 0.22727	0.25533 0.22443	0.22927 0.21393	0.24716	0.22369	AVRG		0.23222		6.04166	
Methylene Chloride	NE 474209	5802 927668	9340 1389833	17193 1881972	39927	187449	LINR	-0.03078	0.53493		0.99779	
Methyl tert-butyl ether	NE 1.39016	1.41916 1.42962	1.58859 1.46934	1.47221 1.40500	1.39375	1.36506	AVRG		1.43699		4.66185	
Carbon Disulfide	NE 1.21908	1.57212 1.29393	1.24621 1.28724	1.23712 1.17251	1.12709	1.00908	AVRG		1.24049		12.31026	
trans-1,2-Dichloroethene	NE 0.48088	0.48201 0.50036	0.48895 0.49928	0.47112 0.46553	0.44661	0.41184	AVRG		0.47184		5.95719	
Vinyl Acetate	NE 1.25411	1.16950 1.25690	1.23854 1.27898	1.24209 1.17945	1.24238	1.22126	AVRG		1.23147		2.92064	
1,1-Dichloroethane	NE 0.85043	0.94882 0.83499	0.90695 0.83538	0.84670 0.76646	0.81320	0.74642	AVRG		0.83882		7.46823	
Chloroprene	NE 128333	1388 326899	1731 NE	4354 NE	10066	36907	QUAD	0.00855	7.33525	-5.80581	0.99887	

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ICAL Start Date 11-NOV-2022 1156 **ICAL End Date** 11-NOV-2022 1538

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
2-Butanone	NE 0.20501	0.19701 0.20493	0.19886 0.20482	0.19591 0.19351	0.21233	0.20732	AVRG		0.20219		3.04965	
Methacrylonitrile	NE 0.30796	0.31496 0.30603	0.32332 0.29230	0.25346 0.28675	0.29001	0.28602	AVRG		0.29565		6.96547	
2,2-Dichloropropane	NE 341067	3730 779680	5237 1201871	11193 1601634	26695	103832	LINR	0.02661	0.46277		0.99656	
cis-1,2-Dichloroethene	NE 0.55243	0.58259 0.55001	0.61117 0.56642	0.55000 0.53053	0.53949	0.50921	AVRG		0.55465		5.34752	
Chloroform	NE 0.90623	0.94436 0.90665	0.93930 0.91738	0.87644 0.85919	0.88323	0.82810	AVRG		0.89565		4.21446	
Bromochloromethane	NE 0.29375	0.33175 0.28585	0.29863 0.29175	0.31073 0.27551	0.29595	0.28049	AVRG		0.29605		5.71264	
1,1,1-Trichloroethane	NE 0.62162	0.60396 0.70738	0.47776 0.71829	0.57682 0.65969	0.53453	0.52160	AVRG		0.60241		13.81773	
1,1-Dichloropropene	NE 0.34497	0.37548 0.39211	0.32208 0.38053	0.33968 0.35979	0.31118	0.29311	AVRG		0.34655		9.67762	
1,2-Dichloroethane	NE 0.45028	0.45519 0.44762	0.42282 0.43949	0.44932 0.42925	0.43063	0.42893	AVRG		0.43928		2.66727	
Carbon Tetrachloride	NE 320902	3171 877292	5716 NE	12588 NE	26439	99378	QUAD	0.00358	4.77119	-2.62219	0.99939	
Benzene	NE 1.21893	1.33494 1.23107	1.10653 1.19955	1.16917 1.16297	1.10567	1.07155	AVRG		1.17782		6.81618	
Trichloroethene	NE 0.33123	0.34200 0.34997	0.27358 0.35020	0.31968 0.33798	0.31138	0.28438	AVRG		0.32227		8.63536	

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Volatiles Organics by Method 8260C

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Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Bromodichloromethane	NE 0.40361	0.27950 0.41013	0.32541 0.41914	0.32516 0.41711	0.31974	0.34062	AVRG		0.36005		14.58454	
Methyl Methacrylate	NE 0.45087	0.44818 0.47304	0.43204 0.48592	0.39972 0.46208	0.42042	0.42927	AVRG		0.44462		6.09024	
1,2-Dichloropropane	NE 0.31163	0.31581 0.31737	0.27021 0.31210	0.27890 0.30747	0.29677	0.28567	AVRG		0.29955		5.82511	
Dibromomethane	NE 0.22460	0.21118 0.22126	0.22010 0.22004	0.20775 0.21798	0.21258	0.20735	AVRG		0.21587		2.91287	
4-Methyl-2-Pentanone	NE 0.31356	0.25125 0.32274	0.28167 0.31860	0.26962 0.30750	0.28711	0.29181	AVRG		0.29376		8.18151	
cis-1,3-Dichloropropene	NE 589702	3916 1314625	6701 2111427	12126 2990718	36717	175436	LINR	0.05627	0.51492		0.99885	
Ethyl Methacrylate	NE 0.50593	0.40733 0.53928	0.37773 0.54458	0.38355 0.53641	0.42977	0.45912	AVRG		0.46486		14.72354	
Toluene	NE 1.38778	1.39982 1.44134	1.21104 1.39966	1.26334 1.31011	1.27326	1.25824	AVRG		1.32718		6.11848	
trans-1,3-Dichloropropene	NE 478316	3354 1103954	5135 1776839	10490 2555944	28169	139963	LINR	0.06841	0.43838		0.99809	
2-Hexanone	NE 526402	3253 1147474	6997 1804472	15502 2481566	43345	182995	LINR	0.02689	0.22152		0.99938	
1,1,2-Trichloroethane	NE 0.28535	0.30394 0.28144	0.29168 0.27840	0.31088 0.26792	0.27515	0.27827	AVRG		0.28589		4.87877	
1,3-Dichloropropane	NE 0.59985	0.54458 0.59322	0.62025 0.57919	0.58244 0.55925	0.61540	0.56459	AVRG		0.58431		4.36498	

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Volatiles Organics by Method 8260C

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Dibromochloromethane	NE 445683	2776 982012	5711 1554115	10463 2175278	32648	144312	LINR	0.02904	0.38650		0.99954	
Tetrachloroethene	NE 0.26518	0.36052 0.31293	0.25500 0.30103	0.29775 0.28004	0.28276	0.24046	AVRG		0.28841		12.32266	
1,2-Dibromoethane	NE 0.37580	0.32247 0.37689	0.32027 0.36983	0.34309 0.36138	0.33265	0.35104	AVRG		0.35038		6.30276	
1-Chlorohexane	NE 266333	2433 699070	5434 1079275	10304 NE	25743	88434	QUAD	0.02799	4.47506	-0.90746	0.99670	
Chlorobenzene	NE 0.94880	1.03214 0.97595	0.93103 0.95172	0.96579 0.92152	0.93300	0.88690	AVRG		0.94965		4.26342	
1,1,1,2-Tetrachloroethane	NE 0.33048	0.28764 0.34052	0.28110 0.34297	0.30809 0.33306	0.28325	0.28886	AVRG		0.31066		8.41408	
Ethylbenzene	NE 0.43502	0.44772 0.48275	0.38987 0.47917	0.43387 0.45165	0.42415	0.39460	AVRG		0.43764		7.40184	
m,p-Xylenes	NE 0.55781	0.57229 0.61822	0.47739 0.60746	0.53188 0.56602	0.49962	0.47828	AVRG		0.54544		9.58491	
o-Xylene	NE 0.56239	0.52301 0.59976	0.46265 0.60311	0.51870 0.57783	0.50564	0.49517	AVRG		0.53870		9.13822	
Styrene	NE 1123787	7484 2515807	14453 3972522	30964 5467718	87295	369850	LINR	0.02452	0.97782		0.99917	
Bromoform	NE 291068	1530 649870	3479 1062982	7647 1509527	20007	94499	LINR	0.04610	0.26650		0.99912	
Isopropylbenzene	NE 1.27176	1.20161 1.46187	1.06148 1.44003	1.16431 1.33602	1.14251	1.09706	AVRG		1.24185		11.68451	

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Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
1,1,2,2-Tetrachloroethane	NE 0.99917	0.94673 0.95886	1.10764 0.94009	1.04906 0.90656	1.04746	0.99080	AVRG		0.99404		6.44767	
1,2,3-Trichloropropane	NE 0.85277	0.87208 0.88461	0.83161 0.89266	0.79724 0.87574	0.88013	0.83477	AVRG		0.85796		3.65500	
trans-1,4-Dichloro-2-butene	NE 79394	658 194985	1264 330142	1922 492359	5548	24229	LINR	0.08945	0.08580		0.99526	*
n-Propylbenzene	NE 2.68988	3.02452 3.06948	2.19495 3.07408	2.71517 2.72855	2.41093	2.33363	AVRG		2.69346		12.14017	
Bromobenzene	NE 0.79863	0.78833 0.81550	0.70948 0.81442	0.82995 0.79814	0.80492	0.77153	AVRG		0.79232		4.45882	
1,3,5-Trimethylbenzene	NE 2.02112	2.12091 2.19775	1.72906 2.19016	1.87690 2.05903	1.91318	1.83867	AVRG		1.99409		8.23324	
2-Chlorotoluene	NE 1.90646	2.09036 1.97591	1.76709 1.94903	1.86614 1.83707	1.86391	1.79383	AVRG		1.89442		5.26252	
4-Chlorotoluene	NE 2.16972	2.13619 2.28339	1.96215 2.28292	2.02866 2.13560	2.05117	2.01738	AVRG		2.11858		5.40062	
tert-Butylbenzene	NE 1.68444	2.03427 1.97251	1.49786 1.95203	1.75865 1.81522	1.52886	1.49250	AVRG		1.74848		12.10742	
1,2,4-Trimethylbenzene	NE 2.07216	2.04703 2.17967	2.02846 2.19921	2.27850 2.06798	2.05257	1.94598	AVRG		2.09684		4.87694	
sec-Butylbenzene	NE 1297343	13271 3454225	17948 5412058	48003 7122212	104963	417125	LINR	0.03516	2.50925		0.99562	
p-Isopropyltoluene	NE 1.78818	2.23058 2.15416	1.52520 2.21396	1.93165 2.07475	1.70907	1.59412	AVRG		1.91352		14.13606	

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1,3-Dichlorobenzene	NE 1.35248	1.40202 1.40005	1.35559 1.41127	1.36137 1.34585	1.32950	1.26312	AVRG		1.35792		3.34986	
1,4-Dichlorobenzene	NE 1.38818	1.83660 1.46138	1.57392 1.47515	1.56102 1.40968	1.42880	1.31535	AVRG		1.49445		10.15208	
Benzyl Chloride	NE 247883	2195 744928	2872 1485347	5046 2305969	12456	67066	QUAD	0.09029	3.65220	-0.79083	0.99371	
n-Butylbenzene	NE 902009	9581 2374641	13013 3785172	30228 5128466	69831	294780	LINR	0.04452	1.78149		0.99722	
1,2-Dichlorobenzene	NE 1.37878	1.77704 1.42178	1.43070 1.43714	1.39596 1.36755	1.39990	1.32522	AVRG		1.43712		9.19399	
1,2-Dibromo-3-Chloropropane	NE 84642	243 194924	881 327600	2331 455426	6526	27340	LINR	0.04588	0.15555		0.99863	*
1,2,4-Trichlorobenzene	NE 0.76535	0.94693 0.87347	0.69416 0.90702	0.70447 0.86757	0.64171	0.67334	AVRG		0.78600		14.49685	
Hexachlorobutadiene	NE 169934	2560 483913	3339 776762	7172 NE	13306	60901	QUAD	0.02461	3.29929	-0.60146	0.99631	
Naphthalene	NE 1.94294	2.34585 2.18241	1.81609 2.25421	1.65121 2.18948	1.56626	1.70385	AVRG		1.96137		14.80479	
1,2,3-Trichlorobenzene	NE 0.74741	0.87691 0.83974	0.77069 0.87025	0.72599 0.83224	0.65950	0.69086	AVRG		0.77929		10.18147	
Methyl Acrylate	NE 0.63788	0.58114 0.65496	0.66638 0.66799	0.60901 0.64003	0.62369	0.64549	AVRG		0.63629		4.41179	
1,4-Dioxane	0.00764 0.00783	0.00572 0.00775	0.00896 0.00761	0.00814 0.00725	0.00720	0.00786	AVRG		0.00759		10.84165	

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n-Hexane	NE 264054	3006 763254	5169 NE	10877 NE	22793	83693	QUAD	-0.00349	3.63906	-1.58945	0.99969	
Freon TF	NE 265554	3044 692856	4273 NE	11940 NE	24730	87464	QUAD	-0.00579	3.55380	-1.38042	0.99977	
Methyl Acetate	NE 0.39255	0.44241 0.38801	0.47450 0.38581	0.41241 0.36342	0.41981	0.40337	AVRG		0.40914		8.14900	
Methylcyclohexane	NE 0.65687	0.75984 0.79486	0.61212 0.81168	0.69781 0.80420	0.57963	0.62796	AVRG		0.70500		12.78092	
Isopropyl alcohol	NE 0.03092	0.03841 0.03087	0.03319 0.03130	0.02908 0.02921	0.03288	0.03100	AVRG		0.03187		8.82721	
Allyl alcohol	NE 264054	3292 763254	5169 NE	12118 NE	22793	83693	QUAD	-0.10577	72.95973	-31.94131	0.99965	
4-Methyl-2-pentanol	NE 1277106	6499 3162203	13051 5345216	24117 7390620	72617	382624	LINR	1.67222	0.06433		0.99650	
Tert-butyl alcohol	NE 0.04819	0.04338 0.04888	0.05078 0.04984	0.04730 0.04794	0.05106	0.04792	AVRG		0.04836		4.73312	
Diethyl ether	NE 0.41981	0.48018 0.43079	0.51716 0.43952	0.48104 0.42304	0.43173	0.41683	AVRG		0.44890		7.84645	
1,3-Butadiene	NE 295655	2660 689246	3837 1073997	9824 1414871	21652	86035	LINR	0.03494	0.41146		0.99555	
Cyclohexane	NE 367931	3722 998644	7250 NE	14256 NE	30806	124554	QUAD	-0.00372	2.56518	-0.74833	0.99996	
Tetrahydrofuran	NE 0.08795	0.09847 0.08816	0.09007 0.08756	0.09190 0.08448	0.07422	0.08471	AVRG		0.08750		7.45264	

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alpha-Methylstyrene	NE 534002	4251 1279645	6442 2085929	15380 2924639	43560	174380	LINR	0.04335	0.99763		0.99882	
Diisopropyl ether	NE 1.46114	1.65230 1.50876	1.79423 1.53589	1.56505 1.46125	1.50440	1.43002	AVRG		1.54589		7.38749	
Butyl acrylate	NE 721684	5755 1660715	9969 2725039	16558 3845538	49075	235491	LINR	0.05054	0.68108		0.99881	
Dicyclopentadiene	NE 2.12006	2.13445 2.53482	2.04605 2.56976	2.26511 2.53580	1.75914	1.94049	AVRG		2.21174		12.99323	
1,2,3-Trimethylbenzene	NE 2.11362	2.43907 2.17979	2.22797 2.18399	2.26544 2.12200	2.12491	2.05537	AVRG		2.19024		5.15864	
Ethanol	NE 0.00644	0.00540 0.00654	0.00792 0.00669	0.00753 0.00634	0.00765	0.00650	AVRG		0.00678		11.61431	
Acetaldehyde	NE 190123	NE 411315	NE 699663	5590 992749	22603	68834	LINR	0.29225	0.06981		0.99646	
Dimethyl Disulfide	NE 293810	631 943799	1885 1785183	3997 NE	12751	73144	QUAD	0.07444	3.48254	-0.98353	0.99316	
1,2-Dichloroethylene (total)	NE 0.51666	0.53230 0.52519	0.55006 0.53285	0.51056 0.49803	0.49305	0.46053	AVRG		0.51325		5.19276	
Xylenes (total)	NE 0.52916	0.50201 0.58032	0.43393 0.58386	0.47444 0.55660	0.45487	0.45013	AVRG		0.50726		11.36948	
Dibromofluoromethane	NE 387990	5430 851798	7603 1264289	15872 1763288	36389	161737	LINR	-0.00697	0.49651		0.99912	
1,2-Dichloroethane-d4	NE 449979	5818 940738	10111 1438278	19160 1994105	47752	187085	LINR	-0.01276	0.56011		0.99925	

NE - Not Evaluated, AVRG - Averaged, LINR - Linear Regression, WLIN - Weighted Linear, QUAD - Quadratic, * - Curve Fit Outside Limits

Initial Calibration Data

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_421678

Volatiles Organics by Method 8260C

ICAL Start Date 11-NOV-2022 1156 **ICAL End Date** 11-NOV-2022 1538

Compound	Level 1 0.250 Level 7 50.0	Level 2 0.500 Level 8 100.0	Level 3 1.00 Level 9 150.0	Level 4 2.00 Level 10 200.0	Level 5 5.00	Level 6 20.00	Curve	b	m1	m2	%RSD or R^2	Q
Toluene-d8	NE 1.09663	1.45550 1.22885	1.16619 1.12378	1.17555 1.12762	1.10766	1.22325	AVRG		1.18945		9.28870	
4-Bromofluorobenzene	NE 515213	7000 1154383	11689 1769020	19298 2511444	50749	205602	LINR	0.00366	0.44191		0.99969	

NE - Not Evaluated, AVRG - Averaged, LINR - Linear Regression, WLIN - Weighted Linear, QUAD - Quadratic, * - Curve Fit Outside Limits

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Form 6I

Initial Calibration Verification (ICV)

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Initial Calibration Verification (ICV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_421678

Volatiles Organics by Method 8260C

Instrument ID VOA9.i ICAL Date 11-NOV-2022
Lab File ID U111114.D ICAL Time 1431
?VAL? ?VAL? Conc Units ug/L
Analysis Type VOA Level LOW

Compound	Amount Added	Amount Recovered	% Recovered	Limits	Q
1,1,1,2-Tetrachlor	50.00	50.48	100.98	80-120	
1,1,1-Trichloroeth	50.00	46.48	92.97	80-120	
1,1,2,2-Tetrachlor	50.00	46.60	93.21	80-120	
Freon TF	50.00	45.63	91.28	80-120	
Methyl Acetate	50.00	43.57	87.15	80-120	
Cyclohexane	50.00	45.53	91.08	80-120	
Methylcyclohexane	50.00	44.99	89.98	80-120	
Carbon Disulfide	100.00	86.80	86.81	80-120	
2-Hexanone	100.00	94.33	94.33	80-120	
1,1,2-Trichloroeth	50.00	45.64	91.29	80-120	
1,1-Dichloroethane	50.00	43.38	86.77	80-120	
1,1-Dichloroethene	50.00	43.53	87.06	80-120	
1,1-Dichloropropen	50.00	44.98	89.98	80-120	
1,2,3-Trichloroben	50.00	53.41	106.84	80-120	
1,2,3-Trichloropro	50.00	48.22	96.44	80-120	
1,2,4-Trichloroben	50.00	52.78	105.56	80-120	
1,2,4-Trimethylben	50.00	50.49	100.99	80-120	
1,2-Dibromo-3-Chlo	50.00	44.35	88.70	80-120	
1,2-Dibromoethane	50.00	50.17	100.34	80-120	
Acrolein	100.00	96.32	96.32	80-120	
Acrylonitrile	100.00	87.24	87.24	80-120	
1,2-Dichlorobenzen	50.00	48.01	96.03	80-120	
1,2-Dichloroethane	50.00	46.06	92.13	80-120	
1,2-Dichloropropan	50.00	47.01	94.02	80-120	
1,3,5-Trimethylben	50.00	49.83	99.67	80-120	
1,3-Dichlorobenzen	50.00	49.69	99.39	80-120	
1,3-Dichloropropan	50.00	47.38	94.78	80-120	
1,4-Dichlorobenzen	50.00	47.47	94.95	80-120	
1-Chlorohexane	50.00	42.12	84.26	80-120	
2,2-Dichloropropan	50.00	43.93	87.88	80-120	
2-Butanone	100.00	93.33	93.33	80-120	
2-Chlorotoluene	50.00	48.62	97.25	80-120	
4-Chlorotoluene	50.00	50.10	100.21	80-120	
p-Isopropyltoluene	50.00	47.96	95.92	80-120	

Initial Calibration Verification (ICV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_421678

Volatiles Organics by Method 8260C

Instrument ID VOA9.i ICAL Date 11-NOV-2022
Lab File ID U111114.D ICAL Time 1431
?VAL? ?VAL? Conc Units ug/L
Analysis Type VOA Level LOW

Compound	Amount Added	Amount Recovered	% Recovered	Limits	Q
4-Methyl-2-Pentano	100.00	102.72	102.73	80-120	
Acetone	100.00	92.23	92.23	80-120	
Benzene	50.00	45.44	90.89	80-120	
Bromobenzene	50.00	49.40	98.82	80-120	
Bromochloromethane	50.00	44.77	89.56	80-120	
Bromodichlorometha	50.00	50.74	101.49	80-120	
Bromoform	50.00	44.72	89.45	80-120	
Bromomethane	50.00	48.21	96.42	80-120	
Carbon Tetrachlori	50.00	47.09	94.19	80-120	
Chlorobenzene	50.00	46.83	93.66	80-120	
Chloroethane	50.00	44.83	89.68	80-120	
Chloroform	50.00	45.09	90.18	80-120	
Chloromethane	50.00	44.04	88.09	80-120	
cis-1,2-Dichloroet	50.00	44.51	89.04	80-120	
cis-1,3-Dichloropr	50.00	43.54	87.10	80-120	
Dibromochlorometha	50.00	45.64	91.28	80-120	
Dibromomethane	50.00	46.84	93.70	80-120	
Dichlorodifluorome	50.00	46.35	92.70	80-120	
Ethylbenzene	50.00	48.48	96.96	80-120	
Hexachlorobutadien	50.00	45.55	91.10	80-120	
Isopropylbenzene	50.00	49.14	98.29	80-120	
m,p-Xylenes	100.00	99.20	99.21	80-120	
Methyl tert-butyl	50.00	45.47	90.96	80-120	
Methylene Chloride	50.00	48.02	96.04	80-120	
n-Butylbenzene	50.00	44.12	88.25	80-120	
n-Propylbenzene	50.00	48.81	97.63	80-120	
Naphthalene	50.00	56.60	113.20	80-120	
o-Xylene	50.00	49.93	99.88	80-120	
sec-Butylbenzene	50.00	42.95	85.91	80-120	
Styrene	50.00	46.28	92.57	80-120	
tert-Butylbenzene	50.00	46.75	93.51	80-120	
Tetrachloroethene	50.00	44.40	88.81	80-120	
Toluene	50.00	48.57	97.14	80-120	
trans-1,2-Dichloro	50.00	46.03	92.06	80-120	

Initial Calibration Verification (ICV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_421678

Volatiles Organics by Method 8260C

Instrument ID VOA9.i ICAL Date 11-NOV-2022
Lab File ID U111114.D ICAL Time 1431
?VAL? ?VAL? Conc Units ug/L
Analysis Type VOA Level LOW

Compound	Amount Added	Amount Recovered	% Recovered	Limits	Q
trans-1,3-Dichloro	50.00	42.90	85.80	80-120	
Trichloroethene	50.00	46.96	93.93	80-120	
Trichlorofluoromet	50.00	43.09	86.19	80-120	
Vinyl Chloride	50.00	42.99	85.98	80-120	
1,2-Dichloroethyle	50.00	90.55	181.10*	80-120	
Xylenes (total)	150.00	149.14	99.43	80-120	
1,4-Dioxane	1000.00	929.11	92.91	80-120	
Dibromofluorometha	50.00	49.14	98.28	71-125	
1,2-Dichloroethane	50.00	48.13	96.27	70-125	
Toluene-d8	50.00	51.43	102.86	75-125	
4-Bromofluorobenze	50.00	50.93	101.88	72-125	

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Form 7

Continuing Calibration Verification (CCV)

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_422102

Volatiles Organics by Method 8260C

Instrument ID VOA9.i Injection Date 17-NOV-2022 1053
Lab File ID U111703.D ICAL Date(s) 11-NOV-2022 11-NOV-2022
Analysis Type WATER ICAL Times 1156 1538
Lab Sample ID CCV Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
Dichlorodifluoromethane	50.0	41.64216	0.33377	0.100	16.71567	20.0	Quadratic	
Chloromethane	50.0	44.51583	0.49123	0.100	10.96834	20.0	Linear	
Vinyl Chloride	0.50998	0.44027	0.44027	0.100	13.66978	20.0	Averaged	
Bromomethane	50.0	44.04348	0.31030	0.100	11.91304	20.0	Linear	
Chloroethane	0.37257	0.34274	0.34274	0.100	8.00620	20.0	Averaged	
Trichlorofluoromethane	0.66307	0.57259	0.57259	0.100	13.64461	20.0	Averaged	
Acrolein	100	97.88803	0.03507	0.020	2.11197	20.0	Linear	
Acetone	100	112	0.22632	0.100	-11.85081	20.0	Linear	
1,1-Dichloroethene	0.42642	0.35230	0.35230	0.100	17.38094	20.0	Averaged	
Iodomethane	100	94.68910	0.45416	0.100	5.31090	20.0	Quadratic	
Acrylonitrile	0.23222	0.23532	0.23532	0.050	-1.33282	20.0	Averaged	
Methylene Chloride	50.0	49.78943	0.54914	0.100	0.42114	20.0	Linear	
Methyl tert-butyl ether	1.43699	1.42721	1.42721	0.100	0.68061	20.0	Averaged	
Carbon Disulfide	1.24049	1.03008	1.03008	0.100	16.96144	20.0	Averaged	
trans-1,2-Dichloroethene	0.47184	0.42315	0.42315	0.100	10.32006	20.0	Averaged	
Vinyl Acetate	1.23147	1.32038	1.32038	0.010	-7.22006	20.0	Averaged	
1,1-Dichloroethane	0.83882	0.74455	0.74455	0.200	11.23782	20.0	Averaged	
2-Butanone	0.20219	0.23656	0.23656	0.100	-16.99637	20.0	Averaged	
2,2-Dichloropropane	50.0	44.06127	0.39549	0.100	11.87745	20.0	Linear	
cis-1,2-Dichloroethene	0.55465	0.52420	0.52420	0.100	5.49050	20.0	Averaged	
Chloroform	0.89565	0.85401	0.85401	0.200	4.64936	20.0	Averaged	
Bromochloromethane	0.29605	0.28890	0.28890	0.100	2.41475	20.0	Averaged	
Dibromofluoromethane	50.0	53.98866	0.53958	0.100	-7.97732	20.0	Linear	
1,1,1-Trichloroethane	0.60241	0.56362	0.56362	0.100	6.43891	20.0	Averaged	
1,1-Dichloropropene	0.34655	0.31836	0.31836	0.100	8.13505	20.0	Averaged	
1,2-Dichloroethane	0.43928	0.45028	0.45028	0.100	-2.50414	20.0	Averaged	
Carbon Tetrachloride	50.0	52.12866	0.25292	0.100	-4.25732	20.0	Quadratic	
1,2-Dichloroethane-d4	50.0	52.62157	0.59662	0.100	-5.24314	20.0	Linear	
Benzene	1.17782	1.12374	1.12374	0.500	4.59107	20.0	Averaged	
Trichloroethene	0.32227	0.30132	0.30132	0.200	6.49953	20.0	Averaged	
Bromodichloromethane	0.36005	0.37985	0.37985	0.200	-5.50118	20.0	Averaged	
2-Chloroethylvinyl ether	++++	++++	1.301e+65	0.001	++++	20.0	Averaged	<-
1,2-Dichloropropane	0.29955	0.30817	0.30817	0.100	-2.87773	20.0	Averaged	
Dibromomethane	0.21587	0.21722	0.21722	0.100	-0.62439	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_422102

Volatiles Organics by Method 8260C

Instrument ID VOA9.i Injection Date 17-NOV-2022 1053
Lab File ID U111703.D ICAL Date(s) 11-NOV-2022 11-NOV-2022
Analysis Type WATER ICAL Times 1156 1538
Lab Sample ID CCV Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
4-Methyl-2-Pentanone	0.29376	0.32474	0.32474	0.100	-10.54555	20.0	Averaged	
cis-1,3-Dichloropropene	50.0	45.55982	0.44021	0.200	8.88035	20.0	Linear	
Toluene-d8	1.18945	1.25934	1.25934	0.100	-5.87556	20.0	Averaged	
Toluene	1.32718	1.28828	1.28828	0.400	2.93092	20.0	Averaged	
trans-1,3-Dichloropropene	50.0	44.24616	0.35794	0.100	11.50768	20.0	Linear	
2-Hexanone	100	101	0.21997	0.100	-0.64399	20.0	Linear	
1,1,2-Trichloroethane	0.28589	0.29164	0.29164	0.100	-2.01092	20.0	Averaged	
1,3-Dichloropropane	0.58431	0.60517	0.60517	0.100	-3.57002	20.0	Averaged	
Dibromochloromethane	50.0	47.39787	0.35517	0.100	5.20426	20.0	Linear	
Tetrachloroethene	0.28841	0.24065	0.24065	0.200	16.55878	20.0	Averaged	
1,2-Dibromoethane	0.35038	0.37502	0.37502	0.100	-7.03423	20.0	Averaged	
1-Chlorohexane	50.0	37.17681	0.16545	0.100	25.64639	20.0	Quadratic	<-
Chlorobenzene	0.94965	0.91068	0.91068	0.500	4.10314	20.0	Averaged	
1,1,1,2-Tetrachloroethane	0.31066	0.32469	0.32469	0.100	-4.51524	20.0	Averaged	
Ethylbenzene	0.43764	0.39412	0.39412	0.100	9.94526	20.0	Averaged	
m,p-Xylenes	0.54544	0.49682	0.49682	0.100	8.91353	20.0	Averaged	
o-Xylene	0.53870	0.50924	0.50924	0.300	5.46887	20.0	Averaged	
Styrene	50.0	44.15526	0.83953	0.300	11.68948	20.0	Linear	
Bromoform	50.0	45.19731	0.22862	0.100	9.60539	20.0	Linear	
Isopropylbenzene	1.24185	1.06956	1.06956	0.100	13.87368	20.0	Averaged	
1,1,2,2-Tetrachloroethane	0.99404	1.02441	1.02441	0.300	-3.05469	20.0	Averaged	
4-Bromofluorobenzene	50.0	52.58393	0.46313	0.100	-5.16785	20.0	Linear	
1,2,3-Trichloropropane	0.85796	0.88517	0.88517	0.100	-3.17237	20.0	Averaged	
n-Propylbenzene	2.69346	2.26191	2.26191	0.100	16.02223	20.0	Averaged	
Bromobenzene	0.79232	0.78497	0.78497	0.100	0.92853	20.0	Averaged	
1,3,5-Trimethylbenzene	1.99409	1.73863	1.73863	0.100	12.81071	20.0	Averaged	
2-Chlorotoluene	1.89442	1.74582	1.74582	0.100	7.84428	20.0	Averaged	
4-Chlorotoluene	2.11858	1.97210	1.97210	0.100	6.91370	20.0	Averaged	
tert-Butylbenzene	1.74848	1.39786	1.39786	0.100	20.05268	20.0	Averaged	<-
1,2,4-Trimethylbenzene	2.09684	1.86389	1.86389	0.100	11.10976	20.0	Averaged	
sec-Butylbenzene	50.0	36.07455	1.72219	0.100	27.85090	20.0	Linear	<-
p-Isopropyltoluene	1.91352	1.50847	1.50847	0.100	21.16767	20.0	Averaged	<-
1,3-Dichlorobenzene	1.35792	1.24384	1.24384	0.600	8.40118	20.0	Averaged	
1,4-Dichlorobenzene	1.49445	1.29884	1.29884	0.400	13.08923	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_422102

Volatiles Organics by Method 8260C

Instrument ID VOA9.i Injection Date 17-NOV-2022 1053
Lab File ID U111703.D ICAL Date(s) 11-NOV-2022 11-NOV-2022
Analysis Type WATER ICAL Times 1156 1538
Lab Sample ID CCV Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
n-Butylbenzene	50.0	36.70127	1.22834	0.500	26.59746	20.0	Linear	<-
1,2-Dichlorobenzene	1.43712	1.28107	1.28107	0.400	10.85853	20.0	Averaged	
1,2-Dibromo-3-Chloropropane	50.0	43.32057	0.12764	0.050	13.35887	20.0	Linear	
1,2,4-Trichlorobenzene	0.78600	0.68885	0.68885	0.200	12.35960	20.0	Averaged	
Hexachlorobutadiene	50.0	39.18861	0.24066	0.100	21.62277	20.0	Quadratic	<-
Naphthalene	1.96137	1.88642	1.88642	0.200	3.82135	20.0	Averaged	
1,2,3-Trichlorobenzene	0.77929	0.69432	0.69432	0.100	10.90288	20.0	Averaged	
1,2-Dichloroethylene (total	0.51325	0.47367	0.47367	0.200	7.71048	20.0	Averaged	
Xylenes (total)	0.50726	0.46530	0.46530	0.100	8.27112	20.0	Averaged	
1,4-Dioxane	0.00759	0.00713	0.00713	0.001	6.11014	20.0	Averaged	
Cyclohexane	50.0	46.22822	0.41121	0.100	7.54355	20.0	Quadratic	
Freon TF	50.0	45.96114	0.29382	0.100	8.07772	20.0	Quadratic	
1,3-Butadiene	50.0	40.78171	0.32122	0.100	18.43658	20.0	Linear	
Methylcyclohexane	0.70500	0.75647	0.75647	0.100	-7.30087	20.0	Averaged	
Methyl Acetate	0.40914	0.39190	0.39190	0.100	4.21564	20.0	Averaged	
Tert-butyl alcohol	0.04836	0.04684	0.04684	0.005	3.15187	20.0	Averaged	
Isopropyl alcohol	0.03187	0.03029	0.03029	0.005	4.98122	20.0	Averaged	
trans-1,4-Dichloro-2-butene	50.0	42.99300	0.06610	0.050	14.01400	20.0	Linear	
Isobutyl Alcohol	1000	914	0.05740	0.005	8.55758	20.0	Linear	
Acetonitrile	0.05081	0.05109	0.05109	0.005	-0.54590	20.0	Averaged	
Allyl Chloride	1.16272	1.19905	1.19905	0.100	-3.12464	20.0	Averaged	
Methacrylonitrile	0.29565	0.32353	0.32353	0.100	-9.43030	20.0	Averaged	
Methyl Methacrylate	0.44462	0.47539	0.47539	0.100	-6.92210	20.0	Averaged	
Propionitrile	0.07998	0.08561	0.08561	0.010	-7.03498	20.0	Averaged	
Methyl Acrylate	0.63629	0.69728	0.69728	0.100	-9.58607	20.0	Averaged	
Ethyl Methacrylate	0.46486	0.53360	0.53360	0.100	-14.78914	20.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_422102

Volatiles Organics by Method 8260C

Instrument ID VOA9.i Injection Date 17-NOV-2022 2139
Lab File ID U111732.D ICAL Date(s) 11-NOV-2022 11-NOV-2022
Analysis Type WATER ICAL Times 1156 1538
Lab Sample ID CCV-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
Dichlorodifluoromethane	50.0	49.74620	0.40745	0.100	0.50760	50.0	Quadratic	
Chloromethane	50.0	46.55391	0.51384	0.100	6.89218	50.0	Linear	
Vinyl Chloride	0.50998	0.48326	0.48326	0.100	5.23980	50.0	Averaged	
Bromomethane	50.0	46.49779	0.32717	0.100	7.00443	50.0	Linear	
Chloroethane	0.37257	0.34371	0.34371	0.100	7.74723	50.0	Averaged	
Trichlorofluoromethane	0.66307	0.59836	0.59836	0.100	9.75893	50.0	Averaged	
Acrolein	100	89.60813	0.03208	0.020	10.39187	50.0	Linear	
Acetone	100	80.16821	0.16625	0.100	19.83179	50.0	Linear	
1,1-Dichloroethene	0.42642	0.37433	0.37433	0.100	12.21416	50.0	Averaged	
Iodomethane	100	90.27828	0.43212	0.100	9.72172	50.0	Quadratic	
Acrylonitrile	0.23222	0.21099	0.21099	0.050	9.14079	50.0	Averaged	
Methylene Chloride	50.0	49.53374	0.54641	0.100	0.93252	50.0	Linear	
Methyl tert-butyl ether	1.43699	1.20824	1.20824	0.100	15.91825	50.0	Averaged	
Carbon Disulfide	1.24049	1.05109	1.05109	0.100	15.26757	50.0	Averaged	
trans-1,2-Dichloroethene	0.47184	0.43153	0.43153	0.100	8.54340	50.0	Averaged	
Vinyl Acetate	1.23147	1.00752	1.00752	0.010	18.18571	50.0	Averaged	
1,1-Dichloroethane	0.83882	0.77131	0.77131	0.200	8.04828	50.0	Averaged	
2-Butanone	0.20219	0.19734	0.19734	0.100	2.40004	50.0	Averaged	
2,2-Dichloropropane	50.0	35.55721	0.31678	0.100	28.88559	50.0	Linear	
cis-1,2-Dichloroethene	0.55465	0.52715	0.52715	0.100	4.95836	50.0	Averaged	
Chloroform	0.89565	0.86877	0.86877	0.200	3.00152	50.0	Averaged	
Bromochloromethane	0.29605	0.27692	0.27692	0.100	6.46125	50.0	Averaged	
Dibromofluoromethane	50.0	54.30984	0.54277	0.100	-8.61968	50.0	Linear	
1,1,1-Trichloroethane	0.60241	0.57736	0.57736	0.100	4.15708	50.0	Averaged	
1,1-Dichloropropene	0.34655	0.32671	0.32671	0.100	5.72302	50.0	Averaged	
1,2-Dichloroethane	0.43928	0.42583	0.42583	0.100	3.06300	50.0	Averaged	
Carbon Tetrachloride	50.0	53.03414	0.25820	0.100	-6.06827	50.0	Quadratic	
1,2-Dichloroethane-d4	50.0	53.42920	0.60567	0.100	-6.85840	50.0	Linear	
Benzene	1.17782	1.12543	1.12543	0.500	4.44804	50.0	Averaged	
Trichloroethene	0.32227	0.31052	0.31052	0.200	3.64526	50.0	Averaged	
Bromodichloromethane	0.36005	0.36189	0.36189	0.200	-0.51079	50.0	Averaged	
2-Chloroethylvinyl ether	++++	++++	1.301e+65	0.001	++++	50.0	Averaged	<-
1,2-Dichloropropane	0.29955	0.29964	0.29964	0.100	-0.03284	50.0	Averaged	
Dibromomethane	0.21587	0.20808	0.20808	0.100	3.60795	50.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_422102

Volatiles Organics by Method 8260C

Instrument ID VOA9.i Injection Date 17-NOV-2022 2139
Lab File ID U111732.D ICAL Date(s) 11-NOV-2022 11-NOV-2022
Analysis Type WATER ICAL Times 1156 1538
Lab Sample ID CCV-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
4-Methyl-2-Pentanone	0.29376	0.29025	0.29025	0.100	1.19617	50.0	Averaged	
cis-1,3-Dichloropropene	50.0	40.96004	0.39284	0.200	18.07991	50.0	Linear	
Toluene-d8	1.18945	1.27592	1.27592	0.100	-7.27022	50.0	Averaged	
Toluene	1.32718	1.30687	1.30687	0.400	1.53019	50.0	Averaged	
trans-1,3-Dichloropropene	50.0	38.58477	0.30831	0.100	22.83046	50.0	Linear	
2-Hexanone	100	85.67754	0.18681	0.100	14.32246	50.0	Linear	
1,1,2-Trichloroethane	0.28589	0.27752	0.27752	0.100	2.92729	50.0	Averaged	
1,3-Dichloropropane	0.58431	0.57115	0.57115	0.100	2.25223	50.0	Averaged	
Dibromochloromethane	50.0	44.33742	0.33151	0.100	11.32516	50.0	Linear	
Tetrachloroethene	0.28841	0.26072	0.26072	0.200	9.59849	50.0	Averaged	
1,2-Dibromoethane	0.35038	0.34850	0.34850	0.100	0.53741	50.0	Averaged	
1-Chlorohexane	50.0	41.53441	0.18642	0.100	16.93117	50.0	Quadratic	
Chlorobenzene	0.94965	0.89292	0.89292	0.500	5.97385	50.0	Averaged	
1,1,1,2-Tetrachloroethane	0.31066	0.31294	0.31294	0.100	-0.73208	50.0	Averaged	
Ethylbenzene	0.43764	0.41061	0.41061	0.100	6.17725	50.0	Averaged	
m,p-Xylenes	0.54544	0.50963	0.50963	0.100	6.56625	50.0	Averaged	
o-Xylene	0.53870	0.51837	0.51837	0.300	3.77257	50.0	Averaged	
Styrene	50.0	43.23518	0.82154	0.300	13.52965	50.0	Linear	
Bromoform	50.0	40.92445	0.20584	0.100	18.15109	50.0	Linear	
Isopropylbenzene	1.24185	1.16616	1.16616	0.100	6.09484	50.0	Averaged	
1,1,2,2-Tetrachloroethane	0.99404	0.94042	0.94042	0.300	5.39412	50.0	Averaged	
4-Bromofluorobenzene	50.0	52.18306	0.45959	0.100	-4.36612	50.0	Linear	
1,2,3-Trichloropropane	0.85796	0.81553	0.81553	0.100	4.94445	50.0	Averaged	
n-Propylbenzene	2.69346	2.49042	2.49042	0.100	7.53833	50.0	Averaged	
Bromobenzene	0.79232	0.78313	0.78313	0.100	1.15993	50.0	Averaged	
1,3,5-Trimethylbenzene	1.99409	1.91301	1.91301	0.100	4.06564	50.0	Averaged	
2-Chlorotoluene	1.89442	1.84507	1.84507	0.100	2.60508	50.0	Averaged	
4-Chlorotoluene	2.11858	2.04622	2.04622	0.100	3.41530	50.0	Averaged	
tert-Butylbenzene	1.74848	1.59962	1.59962	0.100	8.51400	50.0	Averaged	
1,2,4-Trimethylbenzene	2.09684	1.97355	1.97355	0.100	5.87994	50.0	Averaged	
sec-Butylbenzene	50.0	40.92729	1.96572	0.100	18.14543	50.0	Linear	
p-Isopropyltoluene	1.91352	1.64079	1.64079	0.100	14.25258	50.0	Averaged	
1,3-Dichlorobenzene	1.35792	1.28084	1.28084	0.600	5.67630	50.0	Averaged	
1,4-Dichlorobenzene	1.49445	1.29874	1.29874	0.400	13.09617	50.0	Averaged	

Continuing Calibration Verification (CCV)

Client Aptim Environmental & Infrastucture, Inc.
Project LHAAP 67 November 2022

Workorder HS22110582

RunID VOA9_422102

Volatiles Organics by Method 8260C

Instrument ID VOA9.i Injection Date 17-NOV-2022 2139
Lab File ID U111732.D ICAL Date(s) 11-NOV-2022 11-NOV-2022
Analysis Type WATER ICAL Times 1156 1538
Lab Sample ID CCV-END Quant Type ISTD

Compound	$\overline{RRF}$ / Amount	RF50	CCV RRF50	Min RRF	%D / %Drift	Max %D / %Drift	Curve Type	Q
n-Butylbenzene	50.0	39.60628	1.33185	0.500	20.78745	50.0	Linear	
1,2-Dichlorobenzene	1.43712	1.30796	1.30796	0.400	8.98716	50.0	Averaged	
1,2-Dibromo-3-Chloropropane	50.0	38.90147	0.11389	0.050	22.19706	50.0	Linear	
1,2,4-Trichlorobenzene	0.78600	0.65514	0.65514	0.200	16.64870	50.0	Averaged	
Hexachlorobutadiene	50.0	41.97532	0.25924	0.100	16.04937	50.0	Quadratic	
Naphthalene	1.96137	1.58591	1.58591	0.200	19.14241	50.0	Averaged	
1,2,3-Trichlorobenzene	0.77929	0.66277	0.66277	0.100	14.95247	50.0	Averaged	
1,2-Dichloroethylene (total	0.51325	0.47934	0.47934	0.200	6.60628	50.0	Averaged	
Xylenes (total)	0.50726	0.47461	0.47461	0.100	6.43672	50.0	Averaged	
1,4-Dioxane	0.00759	0.00672	0.00672	0.001	11.54976	50.0	Averaged	
Cyclohexane	50.0	51.80095	0.46968	0.100	-3.60190	50.0	Quadratic	
Freon TF	50.0	47.90679	0.30811	0.100	4.18643	50.0	Quadratic	
1,3-Butadiene	50.0	42.80260	0.33785	0.100	14.39480	50.0	Linear	
Methylcyclohexane	0.70500	0.63230	0.63230	0.100	10.31161	50.0	Averaged	
Methyl Acetate	0.40914	0.34316	0.34316	0.100	16.12871	50.0	Averaged	
Tert-butyl alcohol	0.04836	0.03964	0.03964	0.005	18.04593	50.0	Averaged	
Isopropyl alcohol	0.03187	0.02551	0.02551	0.005	19.97286	50.0	Averaged	
trans-1,4-Dichloro-2-butene	50.0	34.44140	0.05142	0.050	31.11720	50.0	Linear	
Isobutyl Alcohol	1000	803	0.04991	0.005	19.65272	50.0	Linear	
Acetonitrile	0.05081	0.04348	0.04348	0.005	14.42906	50.0	Averaged	
Allyl Chloride	1.16272	1.04837	1.04837	0.100	9.83503	50.0	Averaged	
Methacrylonitrile	0.29565	0.27720	0.27720	0.100	6.23981	50.0	Averaged	
Methyl Methacrylate	0.44462	0.39487	0.39487	0.100	11.18872	50.0	Averaged	
Propionitrile	0.07998	0.07630	0.07630	0.010	4.60039	50.0	Averaged	
Methyl Acrylate	0.63629	0.59265	0.59265	0.100	6.85789	50.0	Averaged	
Ethyl Methacrylate	0.46486	0.43662	0.43662	0.100	6.07510	50.0	Averaged	

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Form 8

Internal Standard Area and RT Summary

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Form 8 - Internal Standard Area and RT Summary

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

RunID
VOA9_422102

		IS1		IS2		IS3		IS4	
Sample ID	File ID	Area	RT	Area	RT	Area	RT	Area	RT
12-HOUR STD (CCV)	U111703	831464 #	4.82 #	1345581 #	5.56 #	1249800 #	8.19 #	624281 #	10.17 #
CCB	U111704	1063947	4.82	1545003	5.56	1352231	8.19	590654	10.17
VLCSW-221117	U111705	868110	4.82	1404664	5.55	1281728	8.19	627531	10.17
VBLKW-221117	U111707	1048263	4.82	1549924	5.56	1328748	8.19	582726	10.17
HS22110582-04	U111708	1023957	4.82	1538532	5.55	1329361	8.19	586503	10.17
HS22110582-03	U111709	1030191	4.82	1532878	5.56	1314295	8.19	566477	10.17
HS22110582-05	U111710	1028299	4.82	1543596	5.55	1337305	8.19	583265	10.17
HS22110582-05MS	U111713	1050951	4.82	1548224	5.55	1375119	8.19	666989	10.17
HS22110582-05MSD	U111714	1067289	4.82	1587752	5.56	1420702	8.19	688360	10.17
ZZZZZZMS	U111715	1074664	4.82	1609651	5.56	1409910	8.19	699245	10.17
ZZZZZZMSD	U111716	1076907	4.82	1620437	5.56	1410378	8.19	694644	10.17
HS22110582-05	U111717	1060797	4.82	1610645	5.56	1383007	8.19	609522	10.17
HS22110582-06	U111718	1028484	4.82	1550063	5.55	1321580	8.19	575742	10.17
HS22110582-01	U111721	1037369	4.82	1557073	5.56	1341932	8.19	586906	10.18
HS22110582-02	U111722	1018338	4.82	1523507	5.55	1328306	8.19	577863	10.17
CCV-END	U111732	879993	4.82	1437005	5.56	1330646	8.19	648030	10.17

IS1 - Pentafluorobenzene IS2 - 1,4-Difluorobenzene IS3 - Chlorobenzene-d5 IS4 - 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of 12H STD IS Area
AREA LOWER LIMIT = - 50% of 12H STD IS Area
RT - Retention Time IS - Internal Standard

RT UPPER LIMIT = + 0.50 of 12H STD IS RT
RT LOWER LIMIT = - 0.50 of 12H STD IS RT
CCV - Continuing Calibration Verification

- Area or RT Limit Flag
* - Value Outside Area or RT limits
H - Hour STD - Standard

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Analysis Run Log

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

MSVOA09 -Logbook

Batch: 51987 **Analyst:** Presenta Cabascango

Date: 11-11-2022 **Reviewer:**

Method: 8260 **Laboratory:** Houston

Comments:

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
1	BFB	TUNE	11-11-2022 11:34 am	1.00	50 mL	50 mL	U111101.D	Liquid	Y	NA
2	VSTD000.25	ICAL1	11-11-2022 11:56 am	1.00	50 mL	50 mL	U111102.D	Liquid	Y	NA
3	VSTD000.5	ICAL2	11-11-2022 12:18 pm	1.00	50 mL	50 mL	U111103.D	Liquid	Y	NA
4	VSTD001	ICAL3	11-11-2022 01:03 pm	1.00	50 mL	50 mL	U111104.D	Liquid	Y	NA
5	VSTD002	ICAL4	11-11-2022 01:25 pm	1.00	50 mL	50 mL	U111105.D	Liquid	Y	NA
6	VSTD005	ICAL5	11-11-2022 01:47 pm	1.00	50 mL	50 mL	U111106.D	Liquid	Y	NA
7	VSTD020	ICAL6	11-11-2022 02:09 pm	1.00	50 mL	50 mL	U111107.D	Liquid	Y	NA
8	VSTD050	ICAL7	11-11-2022 02:31 pm	1.00	50 mL	50 mL	U111108.D	Liquid	Y	NA
9	VSTD100	ICAL8	11-11-2022 02:53 pm	1.00	50 mL	50 mL	U111109.D	Liquid	Y	NA
10	VSTD150	ICAL9	11-11-2022 03:16 pm	1.00	50 mL	50 mL	U111110.D	Liquid	Y	NA
11	VSTD200	ICAL	11-11-2022 03:38 pm	1.00	50 mL	50 mL	U111111.D	Liquid	Y	NA
12	BLANK	SAMP	11-11-2022 04:00 pm	1.00	50 mL	50 mL	U111112.D	Liquid	Y	NA
13	BLANK	SAMP	11-11-2022 04:22 pm	1.00	50 mL	50 mL	U111113.D	Liquid	Y	NA
14	CCV	CCV	11-11-2022 04:44 pm	1.00	50 mL	50 mL	U111114.D	Liquid	Y	NA
15	BFB	TUNE	11-11-2022 05:07 pm	1.00	50 mL	50 mL	V111101.D	Liquid	Y	NA
16	CCV	CCV	11-11-2022 05:29 pm	1.00	50 mL	50 mL	V111102a.D	Liquid	Y	NA
17	CCV	CCV	11-11-2022 05:51 pm	1.00	50 mL	50 mL	V111103.D	Liquid	Y	NA
18	CCB	SAMP	11-11-2022 06:13 pm	1.00	50 mL	50 mL	V111104.D	Liquid	Y	NA
19	VLCSW-221110	LCS	11-11-2022 06:36 pm	1.00	50 mL	50 mL	V111105.D	Liquid	Y	NA
20	BLANK	SAMP	11-11-2022 06:58 pm	1.00	50 mL	50 mL	V111106.D	Liquid	Y	NA
21	VBLKW-221110	MBLK	11-11-2022 07:20 pm	1.00	50 mL	50 mL	V111107.D	Liquid	Y	NA
22	HS22110211-10	SAMP	11-11-2022 07:42 pm	1.00	50 mL	50 mL	V111108.D	Liquid	Y	NA
23	HS22110281-08	SAMP	11-11-2022 08:05 pm	1.00	50 mL	50 mL	V111109.D	Liquid	Y	NA
24	HS22110211-01	SAMP	11-11-2022 08:27 pm	1.00	50 mL	50 mL	V111110.D	Liquid	Y	NA
25	HS22110211-02	SAMP	11-11-2022 08:49 pm	1.00	50 mL	50 mL	V111111.D	Liquid	Y	NA
26	HS22110211-03	SAMP	11-11-2022 09:12 pm	1.00	50 mL	50 mL	V111112.D	Liquid	Y	NA
27	HS22110211-04	SAMP	11-11-2022 09:34 pm	1.00	50 mL	50 mL	V111113.D	Liquid	Y	NA
28	HS22110211-05	SAMP	11-11-2022 09:56 pm	1.00	50 mL	50 mL	V111114.D	Liquid	Y	NA
29	HS22110211-06	SAMP	11-11-2022 10:19 pm	1.00	50 mL	50 mL	V111115.D	Liquid	Y	NA
30	HS22110211-07	SAMP	11-11-2022 10:41 pm	1.00	50 mL	50 mL	V111116.D	Liquid	Y	NA
31	HS22110211-08	SAMP	11-11-2022 11:03 pm	1.00	50 mL	50 mL	V111117.D	Liquid	Y	NA
32	HS22110211-09	SAMP	11-11-2022 11:26 pm	1.00	50 mL	50 mL	V111118.D	Liquid	Y	NA
33	HS22110281-01	SAMP	11-11-2022 11:48 pm	1.00	50 mL	50 mL	V111119.D	Liquid	Y	NA
34	HS22110281-02	SAMP	11-12-2022 12:10 am	1.00	50 mL	50 mL	V111120.D	Liquid	Y	NA
35	HS22110281-03	SAMP	11-12-2022 12:33 am	1.00	50 mL	50 mL	V111121.D	Liquid	Y	NA
36	HS22110281-04	SAMP	11-12-2022 12:55 am	1.00	50 mL	50 mL	V111122.D	Liquid	Y	NA
37	HS22110281-05	SAMP	11-12-2022 01:17 am	1.00	50 mL	50 mL	V111123.D	Liquid	Y	NA
38	HS22110281-06	SAMP	11-12-2022 01:40 am	1.00	50 mL	50 mL	V111124.D	Liquid	Y	NA
39	HS22110281-07	SAMP	11-12-2022 02:02 am	1.00	50 mL	50 mL	V111125.D	Liquid	Y	NA
40	HS22110257-05	SAMP	11-12-2022 02:24 am	1.00	50 mL	50 mL	V111126.D	Liquid	Y	NA
41	HS22110257-01	SAMP	11-12-2022 02:47 am	25.00	2 mL	50 mL	V111127.D	Liquid	Y	NA

MSVOA09 -Logbook

#	Samp ID	Type	Analyzed	DF	Init Wt/Vol	Final Vol	File ID	Matrix	Status	pH
42	HS22110281-01MS	MS	11-12-2022 03:09 am	1.00	50 mL	50 mL	V111128.D	Liquid	Y	NA
43	HS22110281-01MSD	MSD	11-12-2022 03:31 am	1.00	50 mL	50 mL	V111129.D	Liquid	Y	NA
44	HS22110281-07MS	MS	11-12-2022 03:54 am	1.00	50 mL	50 mL	V111130.D	Liquid	Y	NA
45	HS22110281-07MSD	MSD	11-12-2022 04:16 am	1.00	50 mL	50 mL	V111131.D	Liquid	Y	NA
46	CCV-END	CCV	11-12-2022 04:38 am	1.00	50 mL	50 mL	V111132.D	Liquid	Y	NA
47	VLANK	SAMP	11-12-2022 05:00 am	1.00	50 mL	50 mL	V111133.D	Liquid	Y	NA

Form 13 - Analysis Run Log

Client Aptim Environmental & Infrastucture, Inc.

Project LHAAP 67 November 2022

Workorder
HS22110582

Volatiles by by EPA 8260

RUNID
VOA9_422102

Run ID VOA9_422102 **Start Date** 11/17/22 **EndDate** 11/17/22 **Matrix** Aqueous

Client Sample ID	Type	Lab Sample ID	File ID	Analysis Date	DF
CCV	CCV	CCV	U111703.D	11/17/22 10:53	1
CCB	CCB	CCB	U111704.D	11/17/22 11:15	1
VLCSW-221117	LCS	VLCSW-221117	U111705.D	11/17/22 11:37	1
VBLKW-221117	MBLK	VBLKW-221117	U111707.D	11/17/22 12:22	1
67WW08-221109-FD	SAMP	HS22110582-04	U111708.D	11/17/22 12:44	1
67WW08-221109	SAMP	HS22110582-03	U111709.D	11/17/22 13:06	1
67WW13-221109	SAMP	HS22110582-05	U111710.D	11/17/22 13:29	1
67WW13-221109	MS	HS22110582-05MS	U111713.D	11/17/22 14:36	1
67WW13-221109	MSD	HS22110582-05MSD	U111714.D	11/17/22 14:58	1
BatchQC	MS	HS22110859-03MS	U111715.D	11/17/22 15:20	500
BatchQC	MSD	HS22110859-03MSD	U111716.D	11/17/22 15:42	500
67WW13-221109	SAMP	HS22110582-05	U111717.D	11/17/22 16:05	10
Trip Blank-221109	SAMP	HS22110582-06	U111718.D	11/17/22 16:27	1
67WW09A-221109	SAMP	HS22110582-01	U111721.D	11/17/22 17:34	1
67WW10-221109	SAMP	HS22110582-02	U111722.D	11/17/22 17:56	1

right solutions.
right partner.

Raw Data VOA9 421678

Volatiles by by EPA 8260

Workorder

HS22110582

Client

Aptim Environmental & Infrastucture, Inc.

Project

LHAAP 67 November 2022

12/05/2022

ALS Environmental–Houston Laboratory
10450 Stancliff Road, Suite 210, Houston, TX 77099
Phone (281) 530-5656 Fax (281) 530-5887
www.alsglobal.com

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111101.D Page 1
Report Date: 11-Nov-2022 13:32

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111101.D
Lab Smp Id: BFB Client Smp ID: BFB
Inj Date : 11-NOV-2022 11:34
Operator : PC Inst ID: VOA9.i
Smp Info : BFB;BFB;3;;BFB
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\bfb.m
Meth Date : 27-Sep-2022 15:12 Linh.Pham Quant Type: ISTD
Cal Date : 30-MAR-2018 18:09 Cal File: U033003.d
Als bottle: 1 QC Sample: BFB
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 4.14 Sample Matrix: WATER
Processing Host: NAHSTW7051

Concentration Formula: Amt * DF * Uf * Vf * Vi * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	2.000	Injection Volume
Cpnd Variable		Local Compound Variable

					CONCENTRATIONS ON-COL (ug/L)	CONCENTRATIONS FINAL (ug/l)	TARGET RANGE	RATIO
1 bfb							CAS #: 460-00-4	
9.197	9.262 (0.000)		95	149504			0.00- 100.00	100.00
9.197	9.262 (0.000)		50	27624			15.00- 40.00	18.48
9.197	9.262 (0.000)		75	74952			30.00- 60.00	50.13
9.197	9.262 (0.000)		96	10641			5.00- 9.00	7.12
9.197	9.262 (0.000)		173	0	0.0	0.0	0.00- 2.00	0.00
9.197	9.262 (0.000)		174	137344			50.00- 0.00	91.87
9.197	9.262 (0.000)		175	12124			5.00- 9.00	8.83
9.197	9.262 (0.000)		176	133248			95.00- 101.00	97.02
9.197	9.262 (0.000)		177	8679			5.00- 9.00	6.51

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	18.48
75	30.00 - 60.00% of mass 95	50.13
96	5.00 - 9.00% of mass 95	7.12
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	91.87
175	5.00 - 9.00% of mass 174	8.11 (8.83)
176	95.00 - 101.00% of mass 174	89.13 (97.02)
177	5.00 - 9.00% of mass 176	5.81 (6.51)

Data File: U111101.D
Spectrum: Scan 2295 (9.19)
Location of Maximum: 95.05
Number of points: 119

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	1316	69.10	14810	104.90	188	141.90	182
37.10	6919	70.00	1441	105.90	809	142.90	1780
38.10	5508	70.90	129	106.90	197	143.80	112
39.10	2150	72.00	895	109.30	135	144.30	82
40.00	595	73.10	7249	111.00	317	145.00	216
42.00	109	74.10	26392	111.80	102	145.90	206
42.70	143	75.00	74952	112.90	319	147.20	157
43.30	188	76.00	6455	114.80	166	147.80	586
44.00	1489	77.00	909	115.90	477	148.90	212
45.10	1226	78.00	716	116.90	1178	150.00	117
45.90	126	78.90	5127	117.90	472	151.70	134
47.20	1475	80.10	1346	118.90	964	152.90	109
47.80	881	81.00	5793	122.00	64	153.80	51
49.10	6314	81.90	1461	122.90	75	155.00	323
50.10	27624	82.90	73	123.70	199	157.00	388
51.00	7610	85.00	124	124.60	59	158.70	363
52.00	450	87.00	6171	125.20	84	161.00	140
55.00	648	88.00	7468	126.10	68	166.80	57
56.00	3061	89.60	123	127.10	85	169.80	85
57.10	4377	91.00	793	127.90	658	170.80	173
58.10	284	92.00	4215	128.80	407	172.00	779
60.00	1269	93.00	6965	130.10	691	174.00	137344
61.00	7780	94.00	19896	130.90	130	175.00	12124
62.00	7190	95.00	149504	133.20	93	176.00	133248
63.10	5787	96.10	10641	133.80	66	176.90	8679
64.00	625	97.00	278	134.90	268	177.90	303
65.00	661	100.70	61	136.70	181	207.40	75
65.60	145	102.10	85	137.10	324	260.80	65
67.20	599	102.90	105	139.50	96	281.00	101
68.00	15662	103.80	893	141.00	1663		

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111101.D Page 1

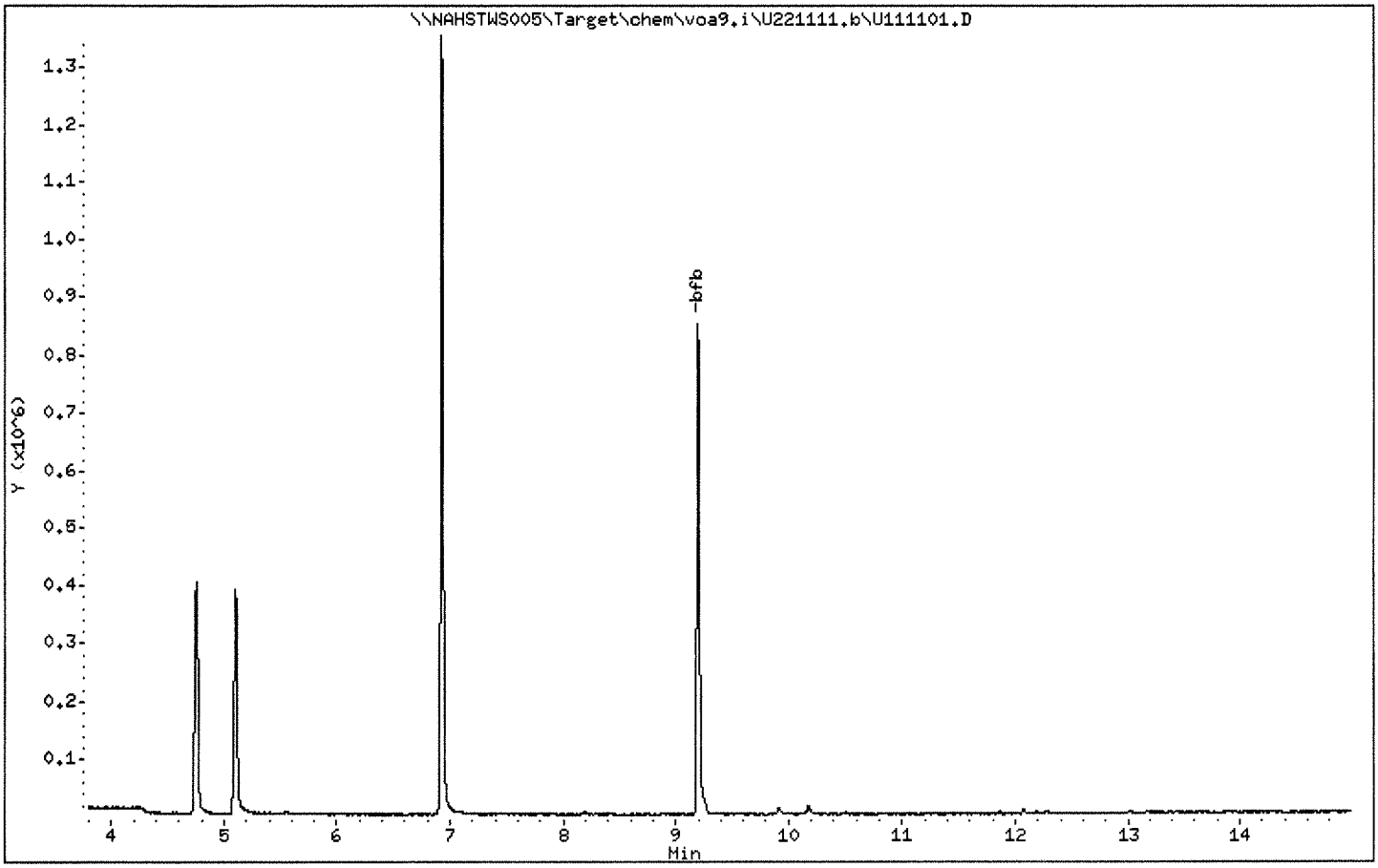
Date : 11-NOV-2022 11:34

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25



Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111101.D Page 2

Date : 11-NOV-2022 11:34

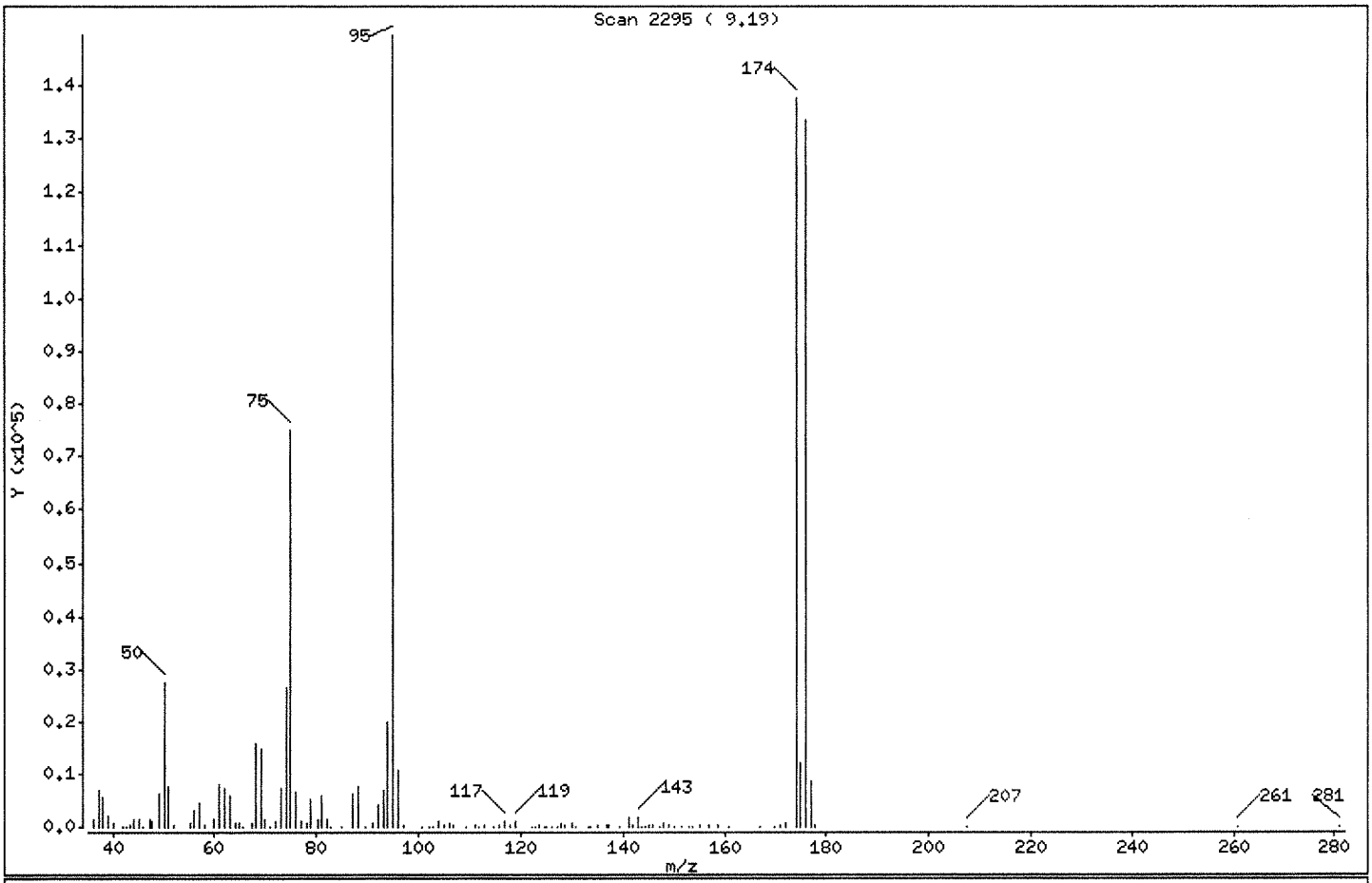
Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

1 bfb



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
95	Base Peak, 100% relative abundance	100.00
50	15.00 - 40.00% of mass 95	18.48
75	30.00 - 60.00% of mass 95	50.13
96	5.00 - 9.00% of mass 95	7.12
173	Less than 2.00% of mass 174	0.00 (0.00)
174	Greater than 50.00% of mass 95	91.87
175	5.00 - 9.00% of mass 174	8.11 (8.83)
176	95.00 - 101.00% of mass 174	89.13 (97.02)
177	5.00 - 9.00% of mass 176	5.81 (6.51)

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111101.D Page 3

Date : 11-NOV-2022 11:34

Client ID: BFB Instrument: VOA9.i

Sample Info: BFB;BFB;3;;BFB

Volume Injected (uL): 2.0 Operator: PC

Column phase: DB624 Column diameter: 0.25

Data File: U111101.D
Spectrum: Scan 2295 (9.19)
Location of Maximum: 95.05
Number of points: 119

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.10	1316	69.10	14810	104.90	188	141.90	182
37.10	6919	70.00	1441	105.90	809	142.90	1780
38.10	5508	70.90	129	106.90	197	143.80	112
39.10	2150	72.00	895	109.30	135	144.30	82
40.00	595	73.10	7249	111.00	317	145.00	216
42.00	109	74.10	26392	111.80	102	145.90	206
42.70	143	75.00	74952	112.90	319	147.20	157
43.30	188	76.00	6455	114.80	166	147.80	586
44.00	1489	77.00	909	115.90	477	148.90	212
45.10	1226	78.00	716	116.90	1178	150.00	117
45.90	126	78.90	5127	117.90	472	151.70	134
47.20	1475	80.10	1346	118.90	964	152.90	109
47.80	881	81.00	5793	122.00	64	153.80	51
49.10	6314	81.90	1461	122.90	75	155.00	323
50.10	27624	82.90	73	123.70	199	157.00	388
51.00	7610	85.00	124	124.60	59	158.70	363
52.00	450	87.00	6171	125.20	84	161.00	140
55.00	648	88.00	7468	126.10	68	166.80	57
56.00	3061	89.60	123	127.10	85	169.80	85
57.10	4377	91.00	793	127.90	658	170.80	173
58.10	284	92.00	4215	128.80	407	172.00	779
60.00	1269	93.00	6965	130.10	691	174.00	137344
61.00	7780	94.00	19896	130.90	130	175.00	12124
62.00	7190	95.00	149504	133.20	93	176.00	133248
63.10	5787	96.10	10641	133.80	66	176.90	8679
64.00	625	97.00	278	134.90	268	177.90	303
65.00	661	100.70	61	136.70	181	207.40	75
65.60	145	102.10	85	137.10	324	260.80	65
67.20	599	102.90	105	139.50	96	281.00	101
68.00	15662	103.80	893	141.00	1663		

Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111101.D
Inj Date : 11-NOV-2022 11:34
InstruID : VOA9.i
LabSampID : BFB

NO MANUAL INTEGRATIONS

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D Page 1
Report Date: 16-Nov-2022 09:41

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D
Lab Smp Id: VSTD000.25 Client Smp ID: VSTD000.25
Inj Date : 11-NOV-2022 11:56
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.25;VSTD000.25;1;1;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\8260C.m
Meth Date : 16-Nov-2022 09:41 VOA9.i Quant Type: ISTD
Cal Date : 11-NOV-2022 14:31 Cal File: U111108.D
Als bottle: 2 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 08260V9.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.823	4.823	(1.000)	802614	50.0000	
2	Dichlorodifluoromethane	85	1.164	1.164	(0.241)	1404	0.25000	0.48
3	Chloromethane	50	1.299	1.299	(0.269)	4868	0.25000	0.79(M)
5	Vinyl Chloride	62	1.381	1.381	(0.287)	2092	0.25000	0.25
6	Bromomethane	94	1.629	1.629	(0.338)	3952	0.25000	
7	Chloroethane	64	1.696	1.696	(0.352)	5358	0.25000	0.89
8	Trichlorofluoromethane	101	1.899	1.899	(0.394)	2458	0.25000	0.23
9	Acrolein	56	2.274	2.274	(0.471)	1108	0.50000	2.90
10	Acetone	43	2.420	2.420	(0.502)	14421	0.50000	
11	1,1-Dichloroethene	96	2.337	2.337	(0.485)	1725	0.25000	0.25
15	Iodomethane	142	2.480	2.480	(0.514)	5219	0.50000	4.65
16	Acrylonitrile	53	3.072	3.072	(0.637)	1784	0.50000	0.47
17	Methylene Chloride	84	2.787	2.787	(0.578)	5715	0.25000	(M)
18	Methyl tert-butyl ether	73	3.083	3.083	(0.639)	6711	0.25000	0.29
19	Carbon Disulfide	76	2.529	2.529	(0.524)	15315	0.50000	0.76
20	trans-1,2-Dichloroethene	96	3.065	3.065	(0.635)	2440	0.25000	0.32
21	Vinyl Acetate	43	3.619	3.619	(0.751)	12261	0.50000	0.62
22	1,1-Dichloroethane	63	3.522	3.522	(0.730)	4303	0.25000	0.31(T)
24	2-Butanone	43	4.275	4.275	(0.887)	1504	0.50000	0.46
27	cis-1,2-Dichloroethene	96	4.200	4.200	(0.871)	2804	0.25000	0.31

28 Chloroform	83	4.575	4.575 (0.949)	4373	0.25000	0.30
29 Bromochloromethane	128	4.474	4.474 (0.928)	1295	0.25000	0.27

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D Page 2
Report Date: 16-Nov-2022 09:41

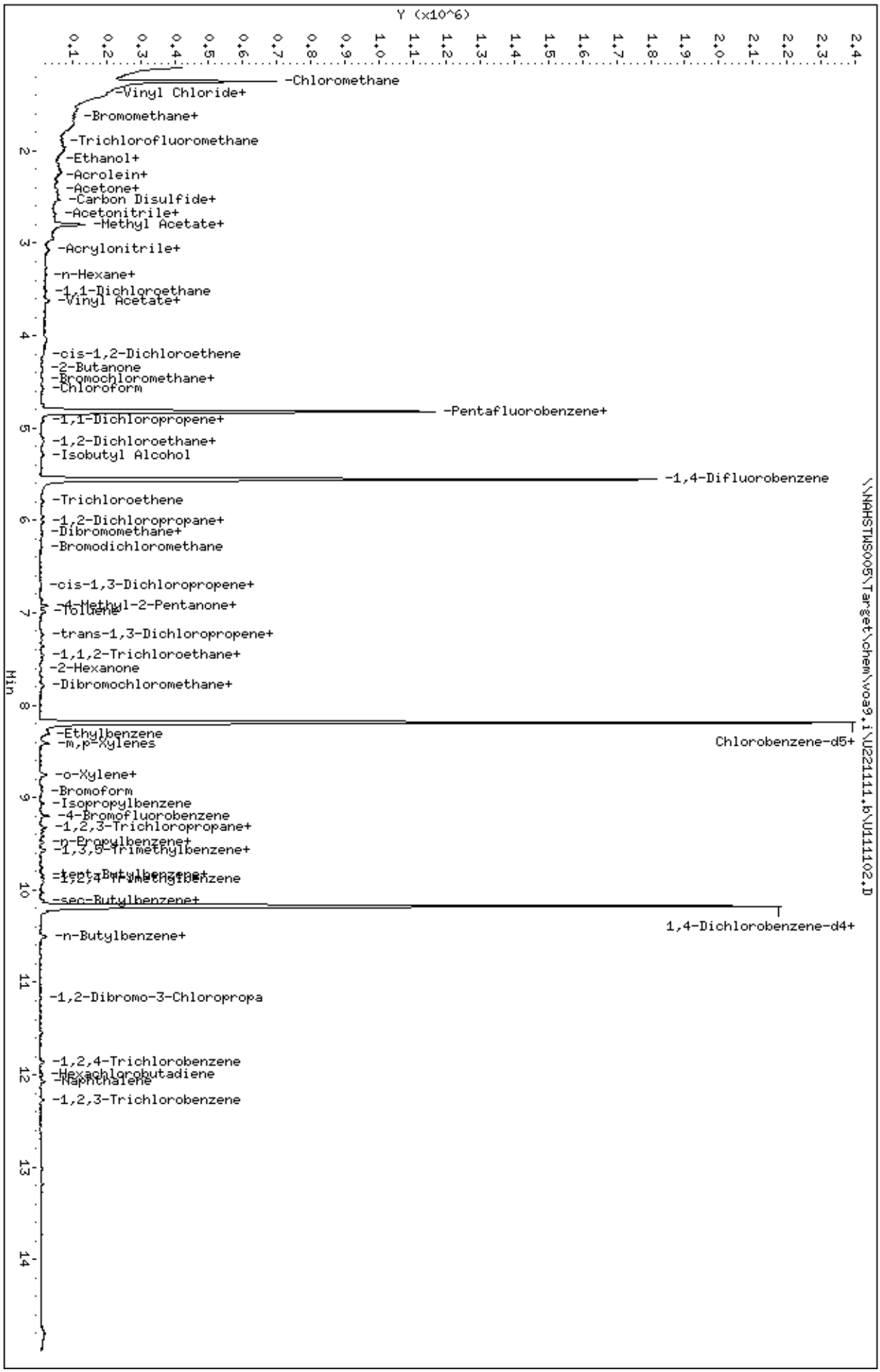
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
$	30 Dibromofluoromethane	113	4.759	4.759	(0.987)	3553	0.25000	0.09
	31 1,1,1-Trichloroethane	97	4.752	4.752	(0.985)	2195	0.25000	0.22
	32 1,1-Dichloropropene	75	4.928	4.928	(0.887)	2386	0.25000	0.24
	33 1,2-Dichloroethane	62	5.186	5.186	(0.933)	4335	0.25000	0.35
	34 Carbon Tetrachloride	117	4.883	4.883	(0.879)	1102	0.25000	0.36(M)
$	35 1,2-Dichloroethane-d4	65	5.108	5.108	(1.059)	4078	0.25000	
*	36 1,4-Difluorobenzene	114	5.557	5.557	(1.000)	1400897	50.0000	
	37 Benzene	78	5.149	5.149	(0.926)	9909	0.25000	0.30
	38 Trichloroethene	130	5.801	5.801	(1.044)	2880	0.25000	0.31
	39 Bromodichloromethane	83	6.288	6.288	(1.132)	2267	0.25000	0.22(M)
	42 1,2-Dichloropropane	63	6.019	6.019	(1.083)	3160	0.25000	0.37
	44 Dibromomethane	93	6.131	6.131	(1.103)	2049	0.25000	0.33
	45 4-Methyl-2-Pentanone	43	6.862	6.862	(0.838)	4596	0.50000	0.60
	46 cis-1,3-Dichloropropene	75	6.701	6.701	(1.206)	2056	0.25000	2.95
*	47 Chlorobenzene-d5	117	8.189	8.189	(1.000)	1302353	50.0000	
$	48 Toluene-d8	98	6.926	6.926	(0.846)	10884	0.25000	0.35
	50 Toluene	91	6.986	6.986	(0.853)	8903	0.25000	0.25
	51 trans-1,3-Dichloropropene	75	7.203	7.203	(1.296)	1153	0.25000	3.51
	52 2-Hexanone	43	7.601	7.601	(0.928)	3210	0.50000	1.90
	53 1,1,2-Trichloroethane	83	7.361	7.361	(0.899)	2288	0.25000	0.30
	54 1,3-Dichloropropane	76	7.503	7.503	(0.916)	4701	0.25000	0.30
	55 Dibromochloromethane	129	7.698	7.698	(0.940)	1611	0.25000	1.61
	56 Tetrachloroethene	164	7.462	7.462	(0.911)	1869	0.25000	0.24
	57 1,2-Dibromoethane	107	7.792	7.792	(0.951)	2367	0.25000	0.25
	58 1-Chlorohexane	55	8.208	8.208	(1.477)	1440	0.25000	1.62(M)
	59 Chlorobenzene	112	8.212	8.212	(1.003)	7150	0.25000	0.28
	60 1,1,1,2-Tetrachloroethane	131	8.283	8.283	(1.011)	2146	0.25000	0.26
	61 Ethylbenzene	106	8.313	8.313	(1.015)	3025	0.25000	0.26
	62 m,p-Xylenes	106	8.414	8.414	(1.027)	6219	0.50000	0.43
	63 o-Xylene	106	8.751	8.751	(1.069)	3602	0.25000	0.25
	64 Styrene	104	8.766	8.766	(1.070)	4077	0.25000	1.38
	66 Bromoform	173	8.924	8.924	(1.090)	1211	0.25000	2.47(T)
	67 Isopropylbenzene	105	9.066	9.066	(1.107)	6913	0.25000	0.21
$	69 4-Bromofluorobenzene	95	9.197	9.197	(1.123)	6793	0.25000	0.77
*	70 1,4-Dichlorobenzene-d4	152	10.172	10.172	(1.000)	583623	50.0000	
	71 1,2,3-Trichloropropane	75	9.366	9.366	(0.921)	3110	0.25000	0.31
	73 n-Propylbenzene	91	9.415	9.415	(0.926)	7402	0.25000	0.23
	74 Bromobenzene	156	9.321	9.321	(0.916)	2946	0.25000	0.31
	75 1,3,5-Trimethylbenzene	105	9.569	9.569	(0.941)	5644	0.25000	0.24
	76 2-Chlorotoluene	91	9.490	9.490	(0.933)	5604	0.25000	0.25
	77 4-Chlorotoluene	91	9.584	9.584	(0.942)	6064	0.25000	0.24
	78 tert-Butylbenzene	119	9.842	9.842	(0.968)	5248	0.25000	0.25
	79 1,2,4-Trimethylbenzene	105	9.887	9.887	(0.972)	5673	0.25000	0.23
	81 sec-Butylbenzene	105	10.026	10.026	(0.986)	5780	0.25000	1.95
	82 p-Isopropyltoluene	119	10.153	10.153	(0.998)	5466	0.25000	0.24
	83 1,3-Dichlorobenzene	146	10.120	10.120	(0.995)	5235	0.25000	0.33
	84 1,4-Dichlorobenzene	146	10.195	10.195	(1.002)	6513	0.25000	0.37
	87 n-Butylbenzene	91	10.498	10.498	(1.032)	4371	0.25000	2.43
	88 1,2-Dichlorobenzene	146	10.509	10.509	(1.033)	4979	0.25000	0.29
	89 1,2-Dibromo-3-Chloropropane	155	11.173	11.173	(1.098)	369	0.25000	2.49(M)
	90 1,2,4-Trichlorobenzene	180	11.867	11.867	(1.167)	3176	0.25000	0.34
	91 Hexachlorobutadiene	225	12.001	12.001	(1.180)	1532	0.25000	1.66

92 Naphthalene	128	12.073	12.073 (1.187)	10075	0.25000	0.44
93 1,2,3-Trichlorobenzene	180	12.275	12.275 (1.207)	3315	0.25000	0.36

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
M 94 1,2-Dichloroethylene (total)	96				5244	0.50000	
M 95 Xylenes (total)	106				9821	0.75000	
135 1,4-Dioxane	88	6.202	6.202	(1.286)	613	5.00000	5.02(M)
141 Cyclohexane	56	4.800	4.800	(0.995)	2282	0.25000	0.17(M)
138 Freon TF	101	2.341	2.341	(0.485)	1579	0.25000	0.05
140 1,3-Butadiene	54	1.411	1.411	(0.293)	1113	0.25000	1.91
147 Methylcyclohexane	55	5.959	5.959	(1.072)	4225	0.25000	0.21
146 Methyl Acetate	43	2.723	2.723	(0.565)	3825	0.25000	0.58

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.



Data File: \\NAHSTWS005\Target\chem\voa9,i\U221111,b\U111102,D
Date : 11-NOV-2022 11:56
Client ID: VSTD000,25
Sample Info: VSTD000,25;VSTD000,25;1;1;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9,i
Operator: PC
Column diameter: 0.18

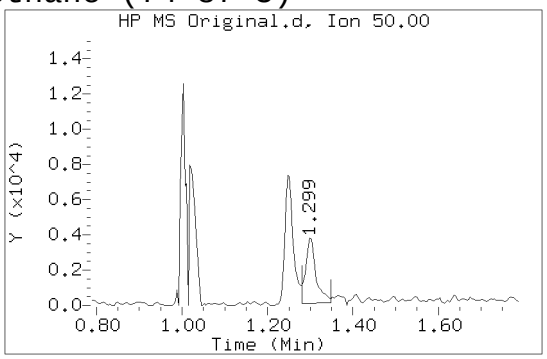
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D
Inj Date : 11-NOV-2022 11:56
InstruID : VOA9.i
LabSampID : VSTD000.25

Chloromethane (74-87-3)

Reason Code:

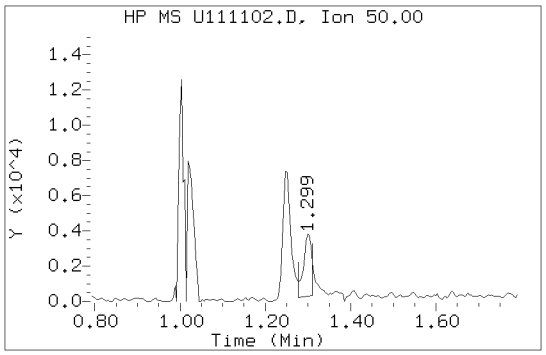
BEFORE

MASS
50
AREA
6401
HEIGHT
3725
16-Nov-2022
09:38
linh
pham



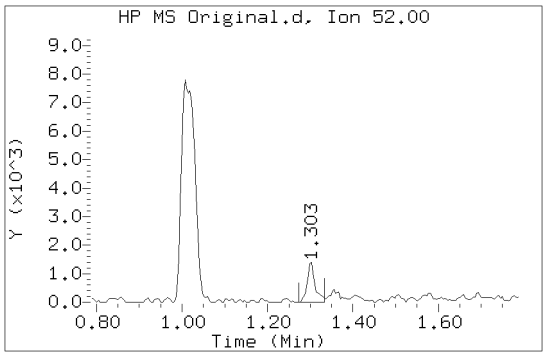
AFTER

MASS
50
AREA
4868
HEIGHT
3560
16-Nov-2022
09:41
linh
pham



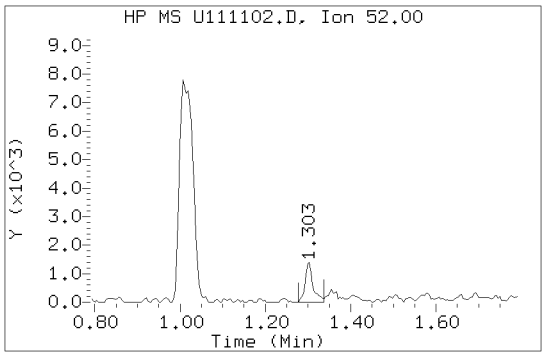
BEFORE

MASS
52
AREA
1800
HEIGHT
1390
16-Nov-2022
09:38
linh
pham



AFTER

MASS
52
AREA
1825
HEIGHT
1390
16-Nov-2022
09:41
linh
pham

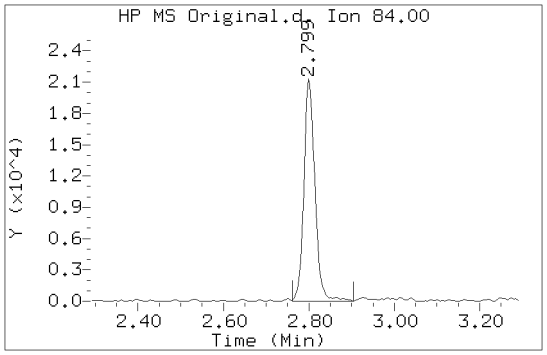


Methylene Chloride (75-09-2)

Reason Code:

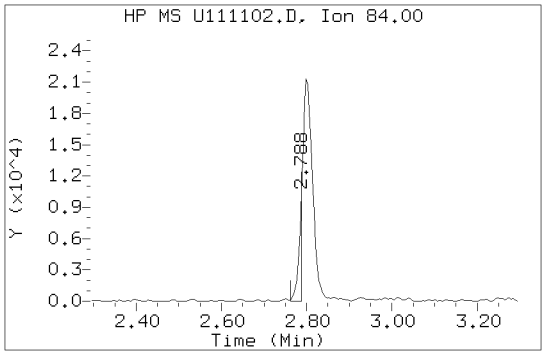
BEFORE

MASS
84
AREA
38837
HEIGHT
21304
16-Nov-2022
09:38
linh
pham



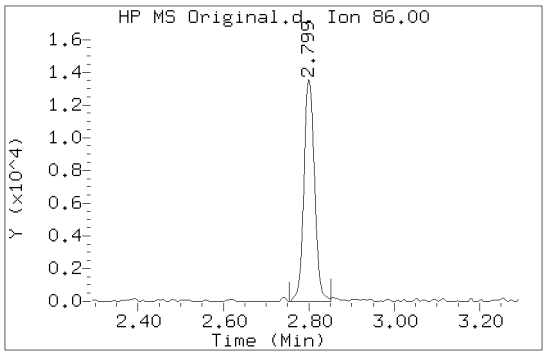
AFTER

MASS
84
AREA
5715
HEIGHT
10511
16-Nov-2022
09:41
linh
pham



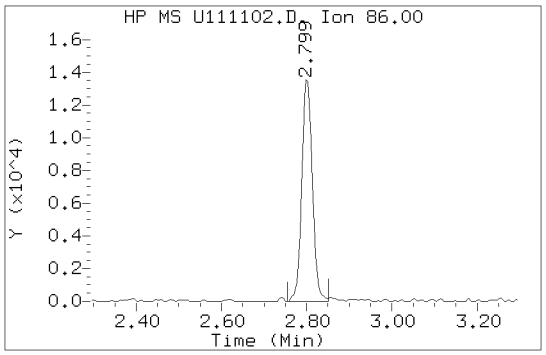
BEFORE

MASS
86
AREA
23995
HEIGHT
13546
16-Nov-2022
09:38
linh
pham



AFTER

MASS
86
AREA
23995
HEIGHT
13546
16-Nov-2022
09:41
linh
pham



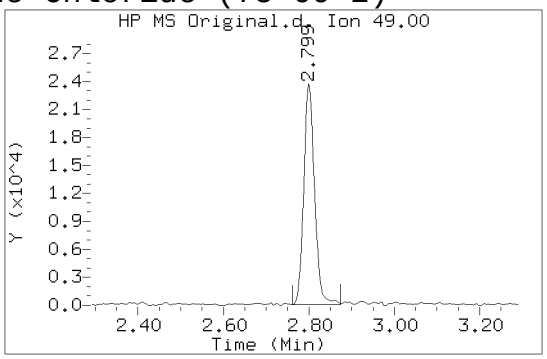
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D
Inj Date : 11-NOV-2022 11:56
InstruID : VOA9.i
LabSampID : VSTD000.25

Methylene Chloride (75-09-2)

Reason Code:

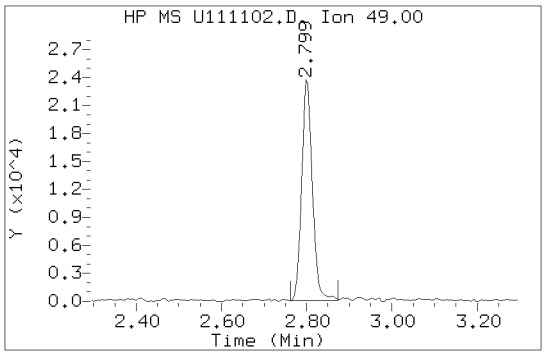
BEFORE

MASS
49
AREA
42071
HEIGHT
23666
16-Nov-2022
09:38
linh
pham



AFTER

MASS
49
AREA
42071
HEIGHT
23666
16-Nov-2022
09:41
linh
pham

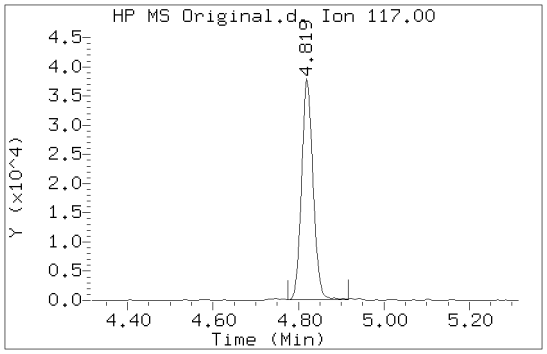


Carbon Tetrachloride (56-23-5)

Reason Code:

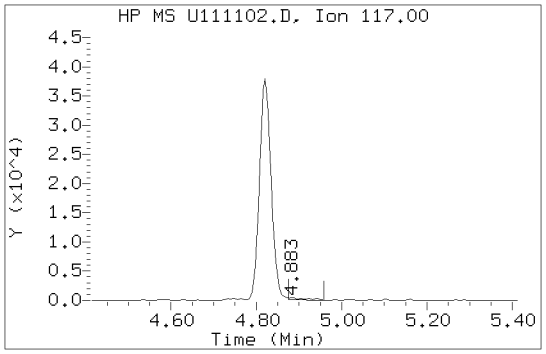
BEFORE

MASS
117
AREA
72507
HEIGHT
37904
16-Nov-2022
09:38
linh
pham



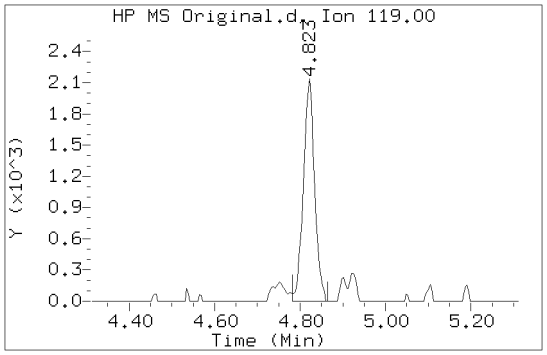
AFTER

MASS
117
AREA
1102
HEIGHT
349
16-Nov-2022
09:41
linh
pham



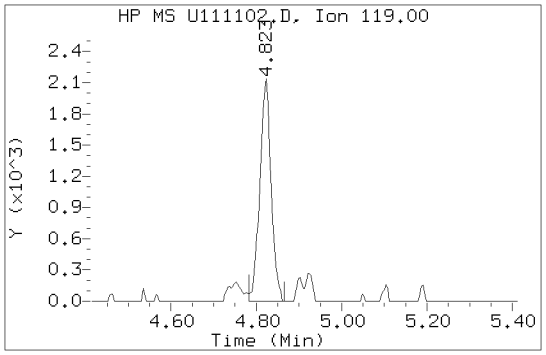
BEFORE

MASS
119
AREA
3921
HEIGHT
2136
16-Nov-2022
09:38
linh
pham



AFTER

MASS
119
AREA
3921
HEIGHT
2136
16-Nov-2022
09:41
linh
pham

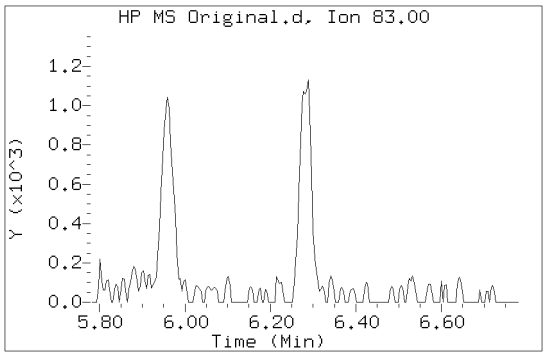


Bromodichloromethane (75-27-4)

Reason Code:

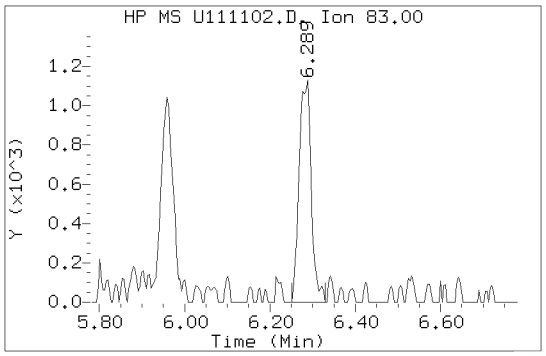
BEFORE

MASS
83
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
83
AREA
2267
HEIGHT
1131
16-Nov-2022
09:41
linh
pham

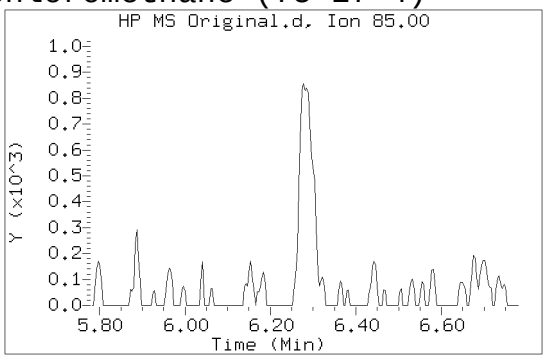


Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D
Inj Date : 11-NOV-2022 11:56
InstruID : VOA9.i
LabSampID : VSTD000.25

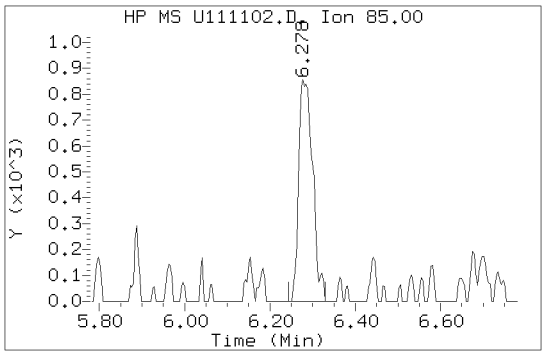
Bromodichloromethane (75-27-4)

Reason Code:

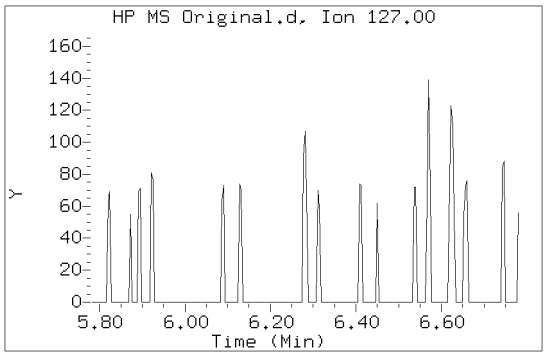
BEFORE
MASS
85
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



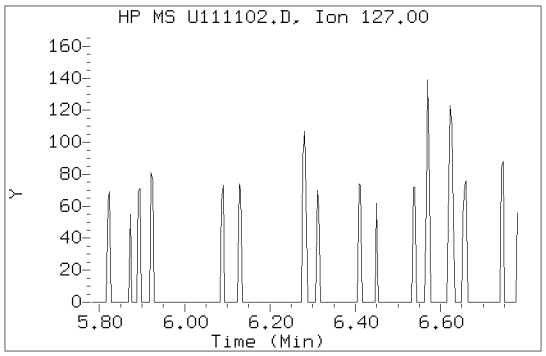
AFTER
MASS
85
AREA
1985
HEIGHT
856
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
127
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



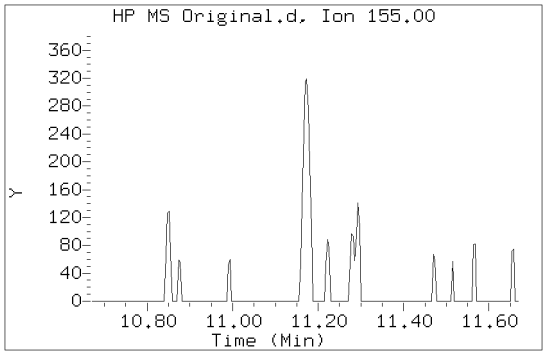
AFTER
MASS
127
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham



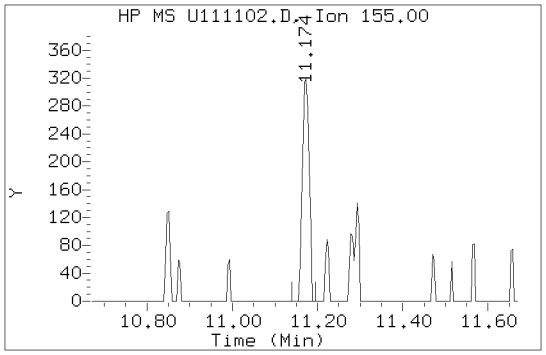
1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

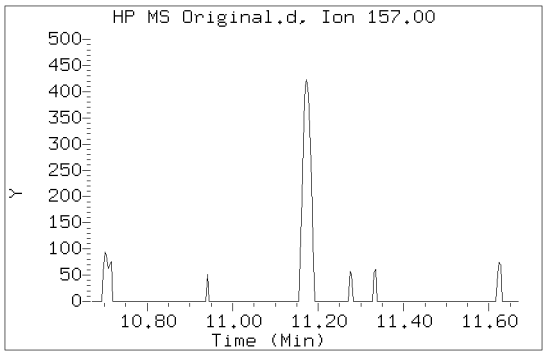
BEFORE
MASS
155
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



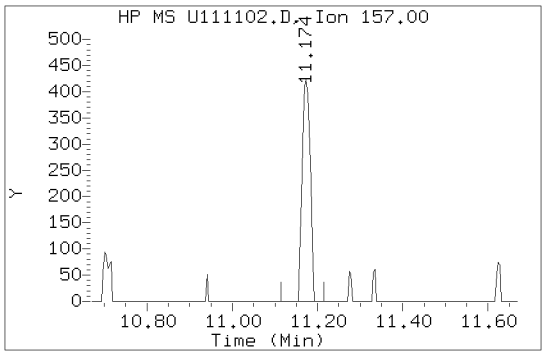
AFTER
MASS
155
AREA
369
HEIGHT
319
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
157
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER
MASS
157
AREA
577
HEIGHT
423
16-Nov-2022
09:41
linh
pham



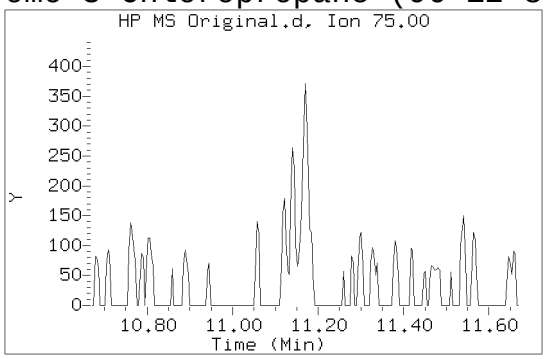
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D
Inj Date : 11-NOV-2022 11:56
InstruID : VOA9.i
LabSampID : VSTD000.25

1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

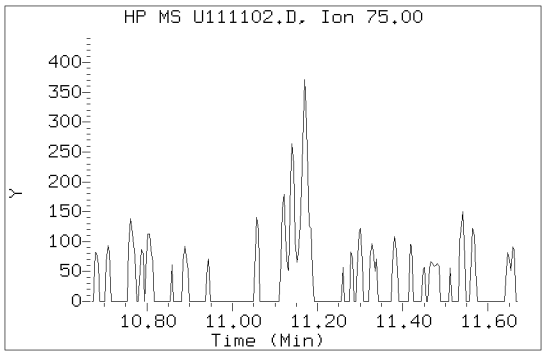
BEFORE

MASS
75
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
75
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham

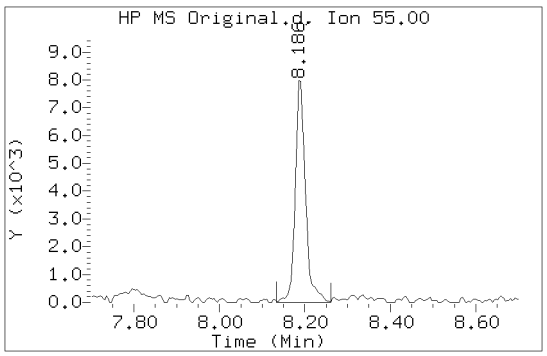


1-Chlorohexane (544-10-5)

Reason Code:

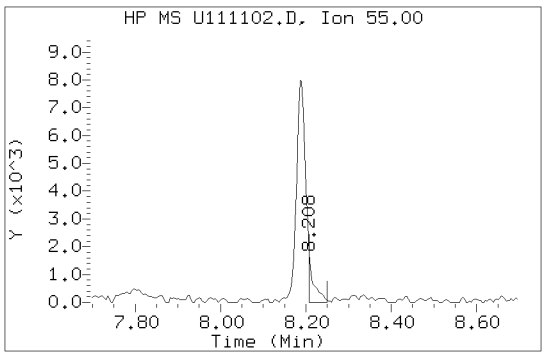
BEFORE

MASS
55
AREA
13371
HEIGHT
7973
16-Nov-2022
09:38
linh
pham



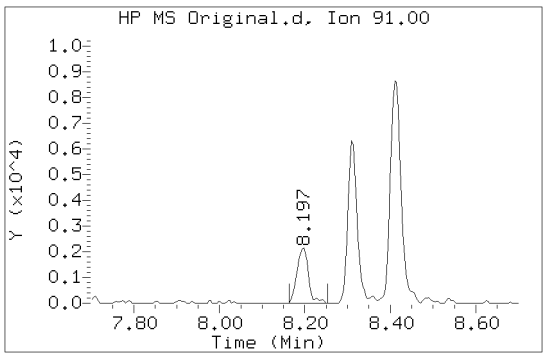
AFTER

MASS
55
AREA
1440
HEIGHT
1739
16-Nov-2022
09:41
linh
pham



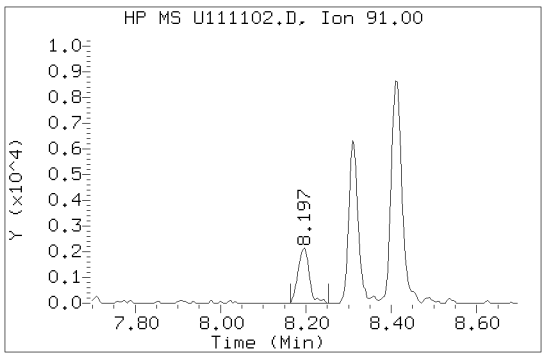
BEFORE

MASS
91
AREA
4053
HEIGHT
2147
16-Nov-2022
09:38
linh
pham



AFTER

MASS
91
AREA
4053
HEIGHT
2147
16-Nov-2022
09:41
linh
pham

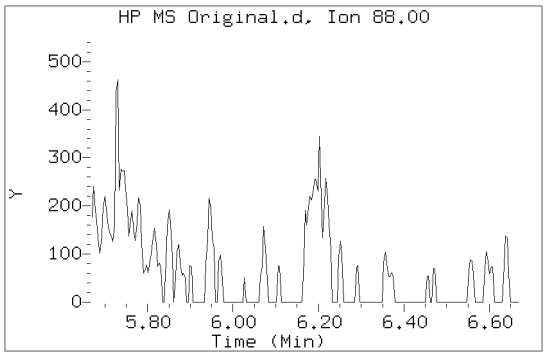


1,4-Dioxane ()

Reason Code:

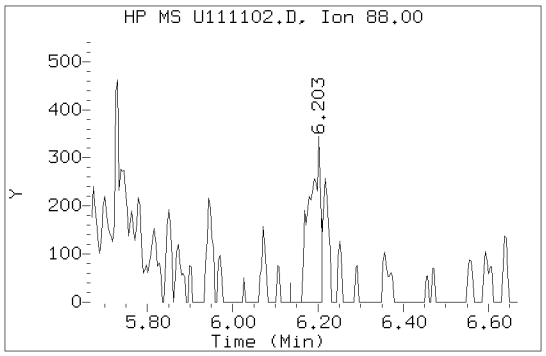
BEFORE

MASS
88
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
88
AREA
613
HEIGHT
344
16-Nov-2022
09:41
linh
pham



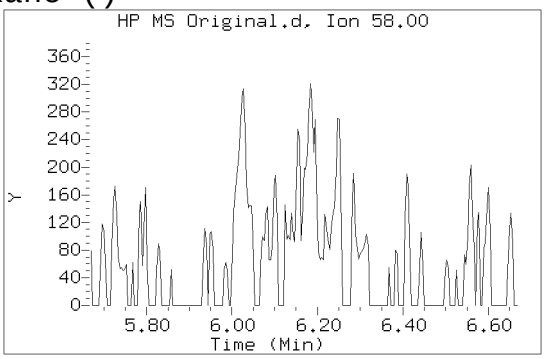
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111102.D
Inj Date : 11-NOV-2022 11:56
InstruID : VOA9.i
LabSampID : VSTD000.25

1,4-Dioxane ()

Reason Code:

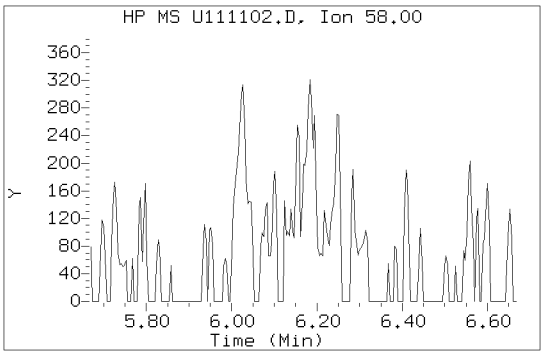
BEFORE

MASS
58
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
58
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham

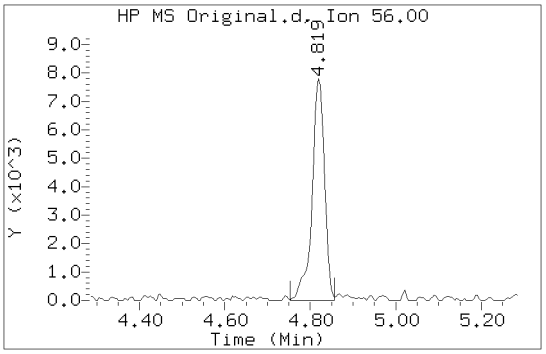


Cyclohexane (110-82-7)

Reason Code:

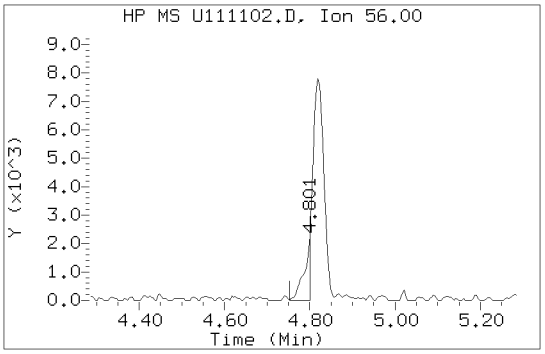
BEFORE

MASS
56
AREA
15875
HEIGHT
7801
16-Nov-2022
09:38
linh
pham



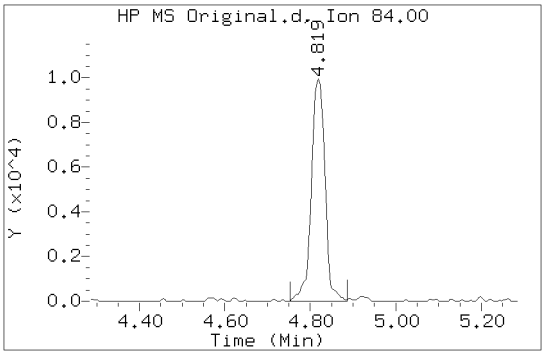
AFTER

MASS
56
AREA
2282
HEIGHT
2288
16-Nov-2022
09:41
linh
pham



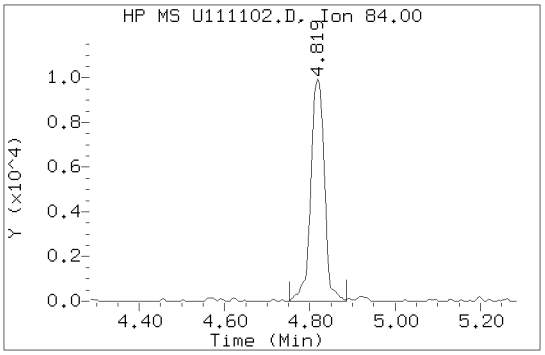
BEFORE

MASS
84
AREA
22211
HEIGHT
9948
16-Nov-2022
09:38
linh
pham



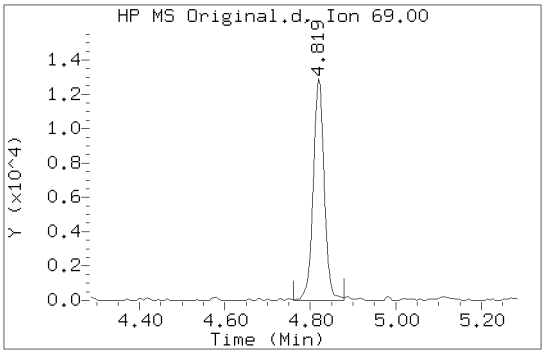
AFTER

MASS
84
AREA
22211
HEIGHT
9948
16-Nov-2022
09:41
linh
pham



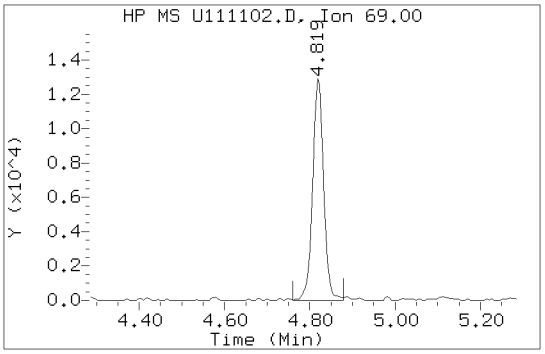
BEFORE

MASS
69
AREA
23202
HEIGHT
12914
16-Nov-2022
09:38
linh
pham



AFTER

MASS
69
AREA
23202
HEIGHT
12914
16-Nov-2022
09:41
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D Page 1
Report Date: 16-Nov-2022 09:41

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
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Inj Date : 11-NOV-2022 12:18
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD000.5;VSTD000.5;1;2;
Misc Info : 180315V9;WATER;0;1;
Comment :
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Meth Date : 16-Nov-2022 09:41 VOA9.i Quant Type: ISTD
Cal Date : 11-NOV-2022 11:56 Cal File: U111102.D
Als bottle: 3 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 08260V9.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.822	4.822	(1.000)	762633	50.0000	
2	Dichlorodifluoromethane	85	1.167	1.167	(0.242)	4110	0.50000	0.97(M)
3	Chloromethane	50	1.302	1.302	(0.270)	5083	0.50000	0.84(M)
5	Vinyl Chloride	62	1.385	1.385	(0.287)	4563	0.50000	0.58
6	Bromomethane	94	1.632	1.632	(0.339)	3746	0.50000	(M)
7	Chloroethane	64	1.711	1.711	(0.355)	3381	0.50000	0.59(M)
8	Trichlorofluoromethane	101	1.906	1.906	(0.395)	5881	0.50000	0.58
9	Acrolein	56	2.281	2.281	(0.473)	810	1.00000	2.46(M)
10	Acetone	43	2.419	2.419	(0.502)	13138	1.00000	(M)
11	1,1-Dichloroethene	96	2.337	2.337	(0.485)	3843	0.50000	0.59
15	Iodomethane	142	2.479	2.479	(0.514)	7282	1.00000	4.95(M)
16	Acrylonitrile	53	3.079	3.079	(0.639)	3765	1.00000	1.06(M)
17	Methylene Chloride	84	2.791	2.791	(0.579)	5802	0.50000	(M)
18	Methyl tert-butyl ether	73	3.091	3.091	(0.641)	10823	0.50000	0.49
19	Carbon Disulfide	76	2.532	2.532	(0.525)	23979	1.00000	1.26(M)
20	trans-1,2-Dichloroethene	96	3.072	3.072	(0.637)	3676	0.50000	0.51
21	Vinyl Acetate	43	3.623	3.623	(0.751)	17838	1.00000	0.94
22	1,1-Dichloroethane	63	3.518	3.518	(0.730)	7236	0.50000	0.56
24	2-Butanone	43	4.283	4.283	(0.888)	3005	1.00000	0.97
26	2,2-Dichloropropane	77	4.196	4.196	(0.870)	3730	0.50000	1.85

27 cis-1,2-Dichloroethene	96	4.204	4.204 (0.872)	4443	0.50000	0.52
28 Chloroform	83	4.582	4.582 (0.950)	7202	0.50000	0.52

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D Page 2
Report Date: 16-Nov-2022 09:41

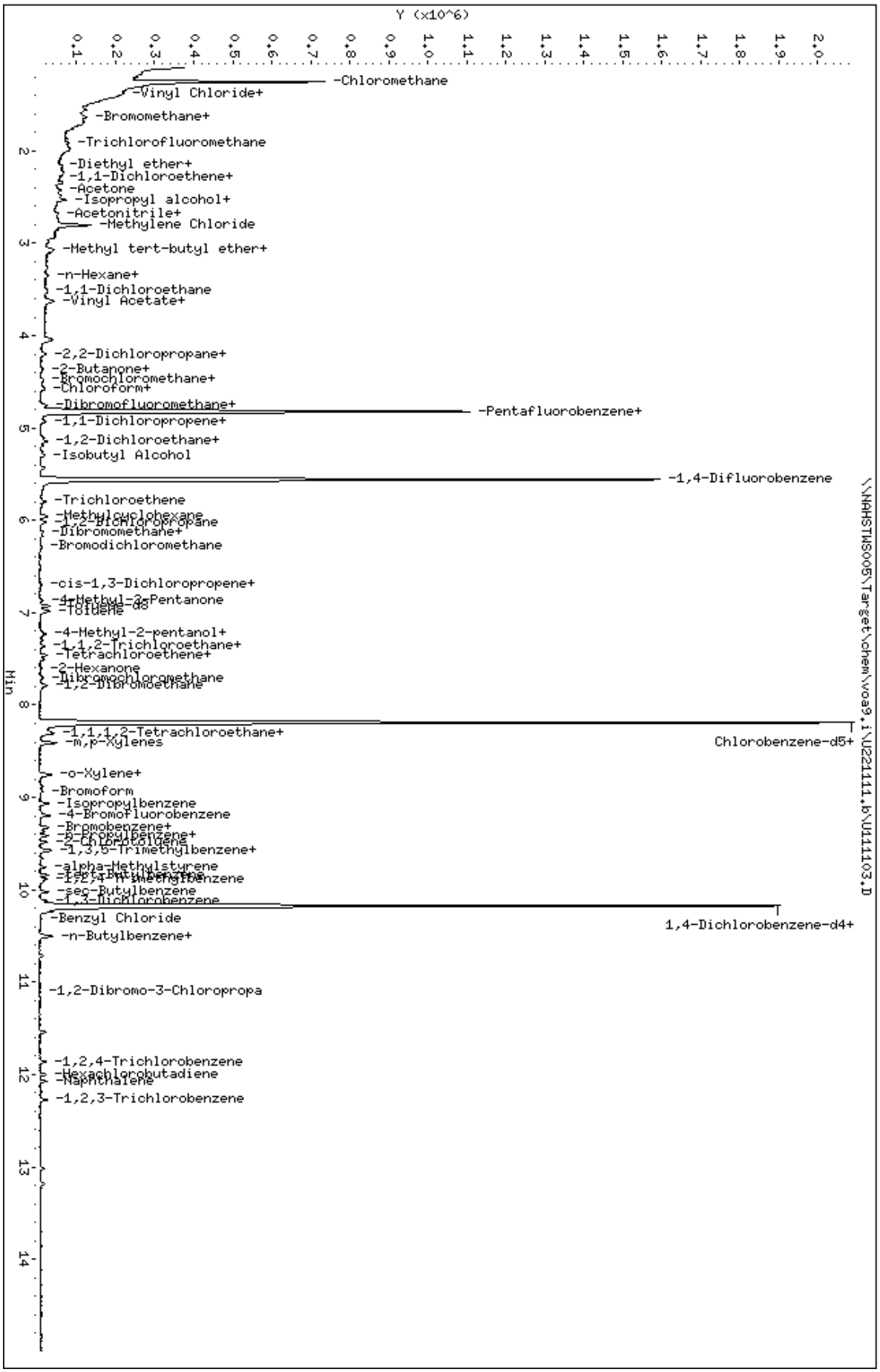
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.474	4.474	(0.928)	2530	0.50000	0.56
$	30 Dibromofluoromethane	113	4.755	4.755	(0.986)	5430	0.50000	0.36
	31 1,1,1-Trichloroethane	97	4.751	4.751	(0.985)	4606	0.50000	0.50
	32 1,1-Dichloropropene	75	4.931	4.931	(0.887)	4644	0.50000	0.54(M)
	33 1,2-Dichloroethane	62	5.186	5.186	(0.933)	5630	0.50000	0.51
	34 Carbon Tetrachloride	117	4.916	4.916	(0.885)	3171	0.50000	0.78(MH)
$	35 1,2-Dichloroethane-d4	65	5.107	5.107	(1.059)	5818	0.50000	0.04(M)
*	36 1,4-Difluorobenzene	114	5.557	5.557	(1.000)	1236833	50.0000	
	37 Benzene	78	5.145	5.145	(0.926)	16511	0.50000	0.56
	38 Trichloroethene	130	5.793	5.793	(1.042)	4230	0.50000	0.53
	39 Bromodichloromethane	83	6.284	6.284	(1.131)	3457	0.50000	0.38(M)
	42 1,2-Dichloropropane	63	6.018	6.018	(1.083)	3906	0.50000	0.52
	44 Dibromomethane	93	6.127	6.127	(1.103)	2612	0.50000	0.48
	45 4-Methyl-2-Pentanone	43	6.865	6.865	(0.838)	5613	1.00000	0.85
	46 cis-1,3-Dichloropropene	75	6.697	6.697	(1.205)	3916	0.50000	3.12(M)
*	47 Chlorobenzene-d5	117	8.189	8.189	(1.000)	1117002	50.0000	
$	48 Toluene-d8	98	6.925	6.925	(0.846)	16258	0.50000	0.61(M)
	50 Toluene	91	6.985	6.985	(0.853)	15636	0.50000	0.52
	51 trans-1,3-Dichloropropene	75	7.199	7.199	(1.295)	3354	0.50000	3.72(M)
	52 2-Hexanone	43	7.604	7.604	(0.929)	3253	1.00000	2.00
	53 1,1,2-Trichloroethane	83	7.360	7.360	(0.899)	3395	0.50000	0.53
	54 1,3-Dichloropropane	76	7.506	7.506	(0.917)	6083	0.50000	0.46(M)
	55 Dibromochloromethane	129	7.694	7.694	(0.940)	2776	0.50000	1.77
	56 Tetrachloroethene	164	7.461	7.461	(0.911)	4027	0.50000	0.62
	57 1,2-Dibromoethane	107	7.791	7.791	(0.951)	3602	0.50000	0.46
	58 1-Chlorohexane	55	8.204	8.204	(1.476)	2433	0.50000	1.83(M)
	59 Chlorobenzene	112	8.211	8.211	(1.003)	11529	0.50000	0.54
	60 1,1,1,2-Tetrachloroethane	131	8.286	8.286	(1.012)	3213	0.50000	0.46
	61 Ethylbenzene	106	8.312	8.312	(1.015)	5001	0.50000	0.51
	62 m,p-Xylenes	106	8.410	8.410	(1.027)	12785	1.00000	1.04
	63 o-Xylene	106	8.747	8.747	(1.068)	5842	0.50000	0.48
	64 Styrene	104	8.762	8.762	(1.070)	7484	0.50000	1.56
	66 Bromoform	173	8.920	8.920	(1.089)	1530	0.50000	2.56(T)
	67 Isopropylbenzene	105	9.066	9.066	(1.107)	13422	0.50000	0.48
	68 1,1,2,2-Tetrachloroethane	83	9.332	9.332	(0.917)	4895	0.50000	0.47(M)
$	69 4-Bromofluorobenzene	95	9.197	9.197	(1.123)	7000	0.50000	0.89
*	70 1,4-Dichlorobenzene-d4	152	10.172	10.172	(1.000)	517041	50.0000	
	71 1,2,3-Trichloropropane	75	9.370	9.370	(0.921)	4509	0.50000	0.50(M)
	73 n-Propylbenzene	91	9.415	9.415	(0.926)	15638	0.50000	0.56
	74 Bromobenzene	156	9.325	9.325	(0.917)	4076	0.50000	0.49
	75 1,3,5-Trimethylbenzene	105	9.564	9.564	(0.940)	10966	0.50000	0.53
	76 2-Chlorotoluene	91	9.486	9.486	(0.933)	10808	0.50000	0.55
	77 4-Chlorotoluene	91	9.579	9.579	(0.942)	11045	0.50000	0.50
	78 tert-Butylbenzene	119	9.842	9.842	(0.968)	10518	0.50000	0.58
	79 1,2,4-Trimethylbenzene	105	9.879	9.879	(0.971)	10584	0.50000	0.48(M)
	81 sec-Butylbenzene	105	10.026	10.026	(0.986)	13271	0.50000	2.26
	82 p-Isopropyltoluene	119	10.149	10.149	(0.998)	11533	0.50000	0.58
	83 1,3-Dichlorobenzene	146	10.119	10.119	(0.995)	7249	0.50000	0.51
	84 1,4-Dichlorobenzene	146	10.194	10.194	(1.002)	9496	0.50000	0.61
	87 n-Butylbenzene	91	10.494	10.494	(1.032)	9581	0.50000	2.74
	88 1,2-Dichlorobenzene	146	10.509	10.509	(1.033)	9188	0.50000	0.61
	89 1,2-Dibromo-3-Chloropropane	155	11.165	11.165	(1.098)	243	0.50000	2.44(M)

90 1,2,4-Trichlorobenzene	180	11.862	11.862 (1.166)	4896	0.50000	0.60
91 Hexachlorobutadiene	225	12.001	12.001 (1.180)	2560	0.50000	2.04(M)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	92 Naphthalene	128	12.072	12.072	(1.187)	12129	0.50000	0.59
	93 1,2,3-Trichlorobenzene	180	12.271	12.271	(1.206)	4534	0.50000	0.56(M)
M	94 1,2-Dichloroethylene (total)	96				8119	1.00000	
M	95 Xylenes (total)	106				18627	1.50000	
	135 1,4-Dioxane	88	6.176	6.176	(1.281)	872	10.0000	7.52(M)
	141 Cyclohexane	56	4.796	4.796	(0.995)	3722	0.50000	0.43(M)
	138 Freon TF	101	2.348	2.348	(0.487)	3044	0.50000	0.41
	140 1,3-Butadiene	54	1.411	1.411	(0.293)	2660	0.50000	2.17(M)
	147 Methylcyclohexane	55	5.955	5.955	(1.071)	9398	0.50000	0.53
	146 Methyl Acetate	43	2.727	2.727	(0.566)	3374	0.50000	0.54(M)

QC Flag Legend

T - Target compound detected outside RT window.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.



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Sample Info: VSTD000.5;VSTD000.5;1;2;
Purge Volume: 5.0
Column phase: DB624

Instrument: VOA9.i
Operator: PC
Column diameter: 0.18

Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

Dichlorodifluoromethane (75-71-8)

Reason Code:

BEFORE

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16-Nov-2022
09:38
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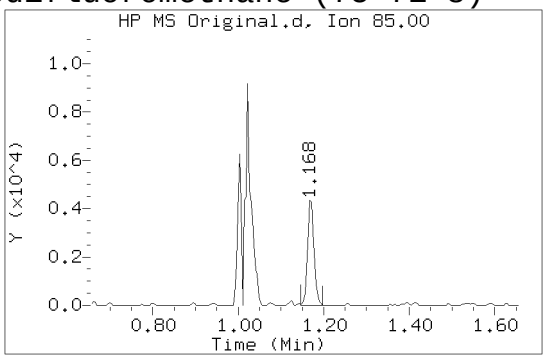

AFTER

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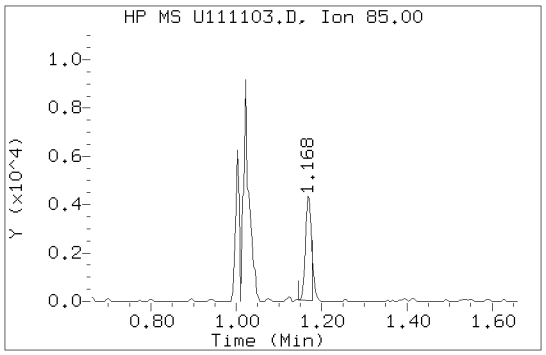

BEFORE

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linh
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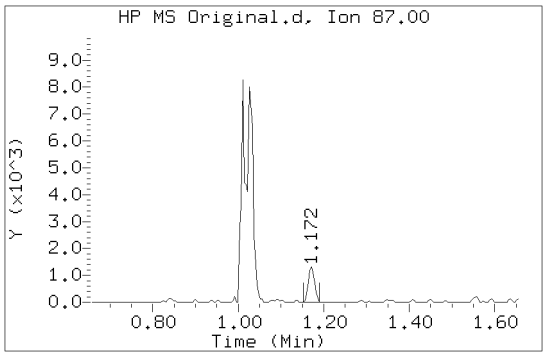

AFTER

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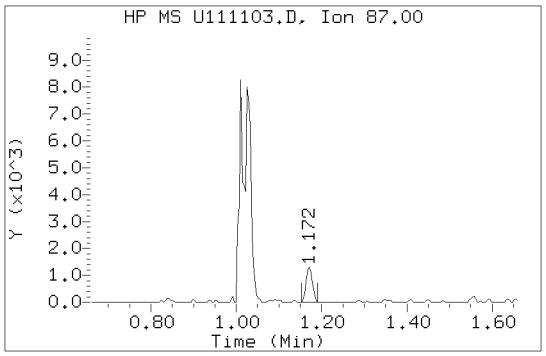

Chloromethane (74-87-3)

Reason Code:

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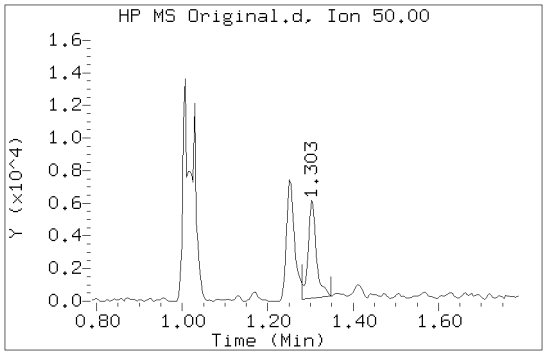

AFTER

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09:41
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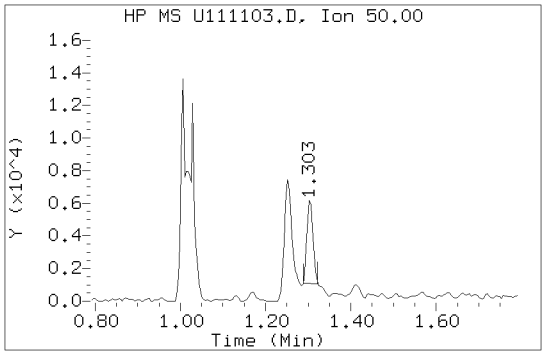

BEFORE

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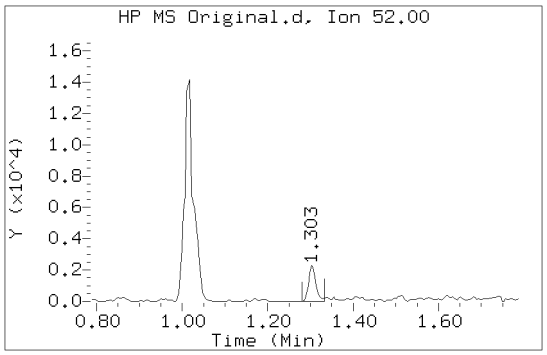

AFTER

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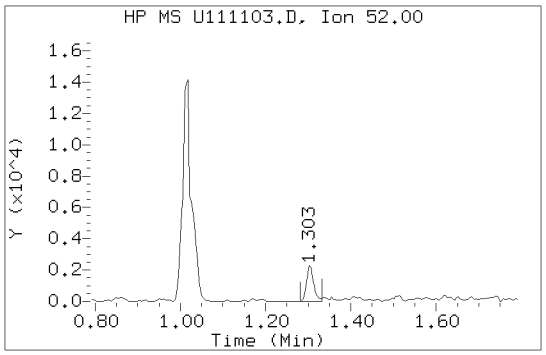

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Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

Bromomethane (74-83-9)

Reason Code:

BEFORE
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AREA
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HEIGHT
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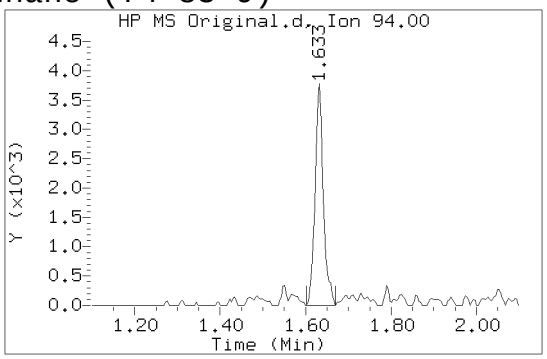
16-Nov-2022
09:38
linh
pham



AFTER
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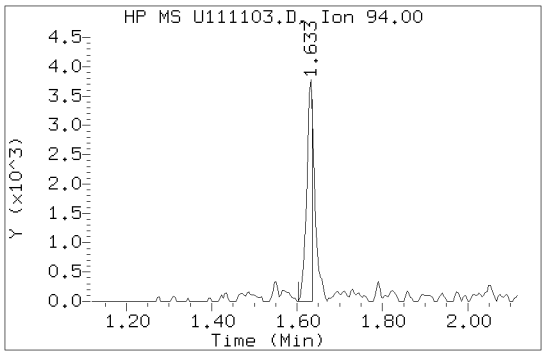

BEFORE
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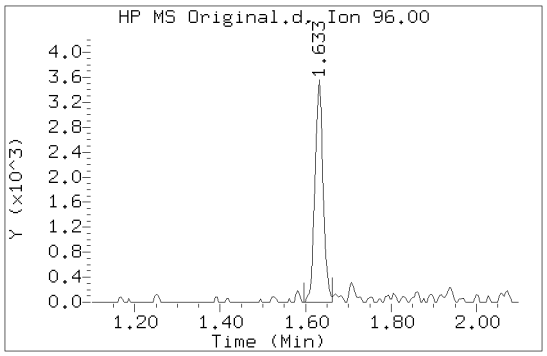

AFTER
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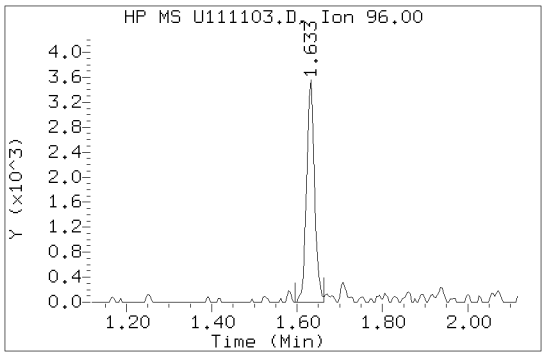

Chloroethane (75-00-3)

Reason Code:

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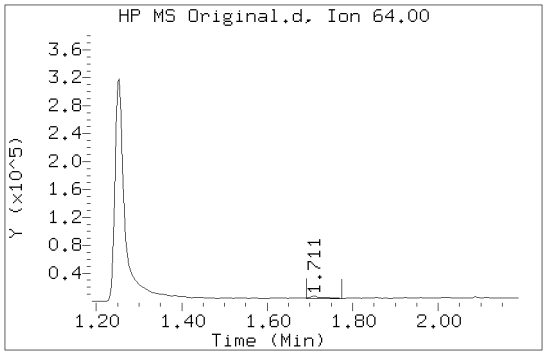

AFTER
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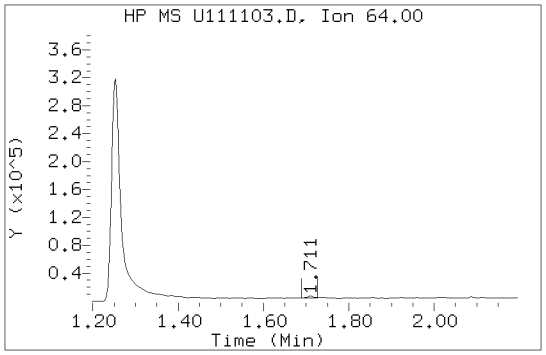

BEFORE
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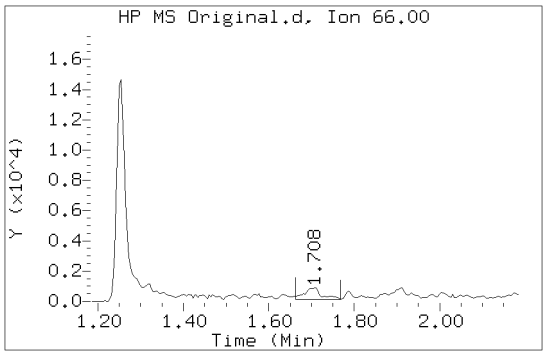

AFTER
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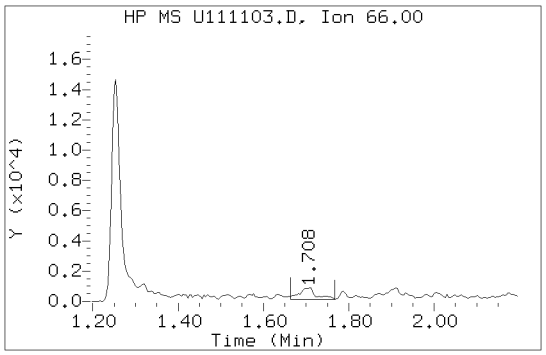

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Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

Acrolein (107-02-8)

Reason Code:

BEFORE

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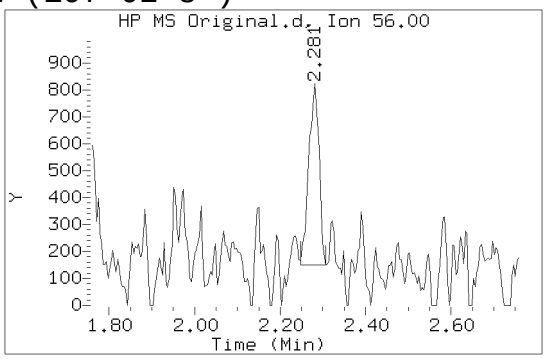

AFTER

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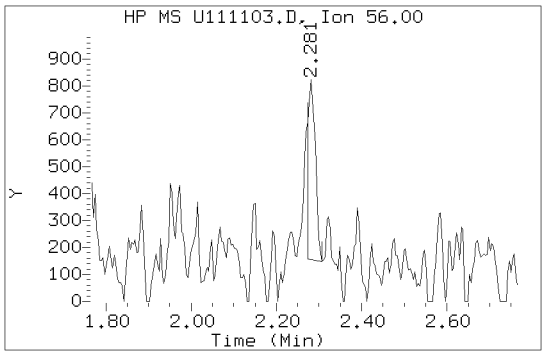

BEFORE

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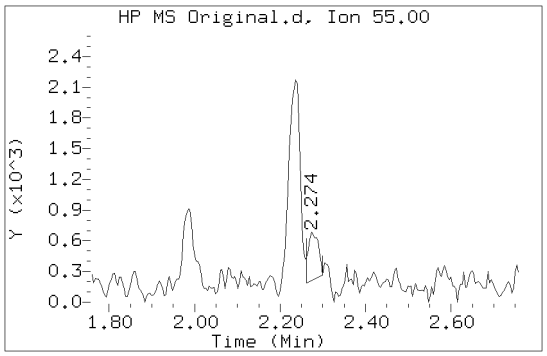
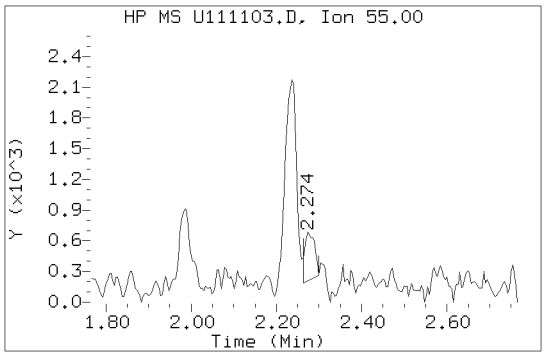
linh
pham



AFTER

MASS
55
AREA
770
HEIGHT
473
16-Nov-2022
09:41
linh
pham

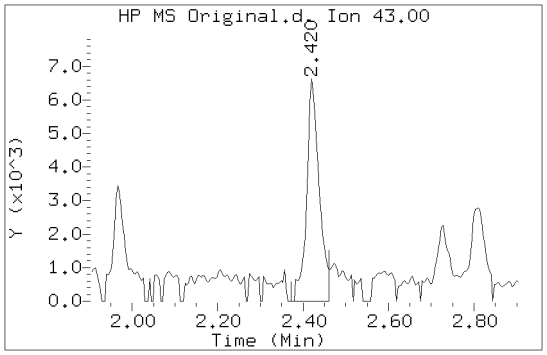


Acetone (67-64-1)

Reason Code:

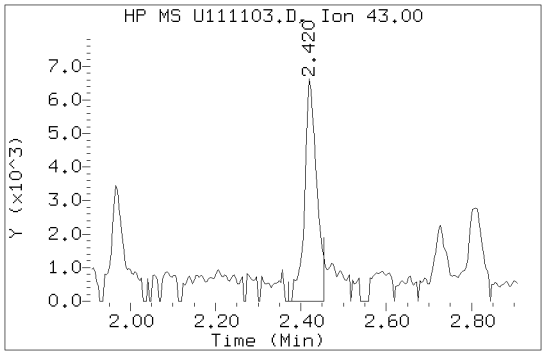
BEFORE

MASS
43
AREA
13583
HEIGHT
6627
16-Nov-2022
09:38
linh
pham



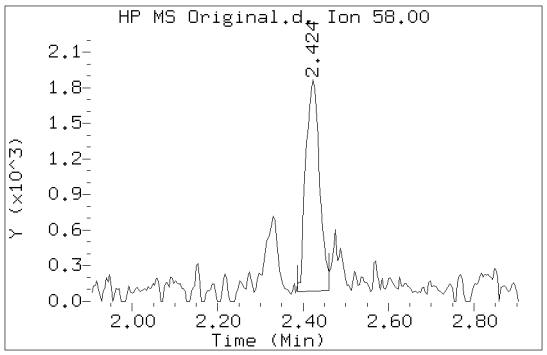
AFTER

MASS
43
AREA
13138
HEIGHT
6627
16-Nov-2022
09:41
linh
pham



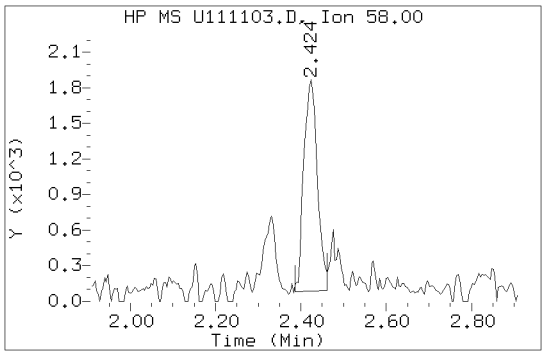
BEFORE

MASS
58
AREA
3997
HEIGHT
1782
16-Nov-2022
09:38
linh
pham



AFTER

MASS
58
AREA
3997
HEIGHT
1782
16-Nov-2022
09:41
linh
pham



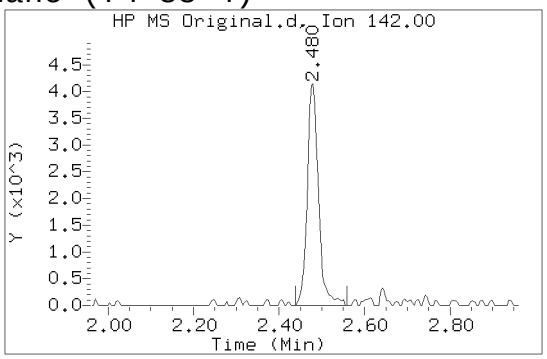
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

Iodomethane (74-88-4)

Reason Code:

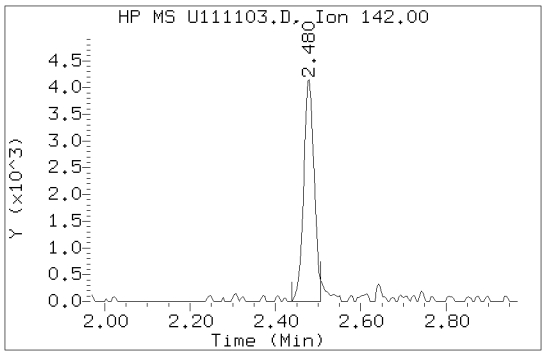
BEFORE

MASS
142
AREA
7702
HEIGHT
4145
16-Nov-2022
09:38
linh
pham



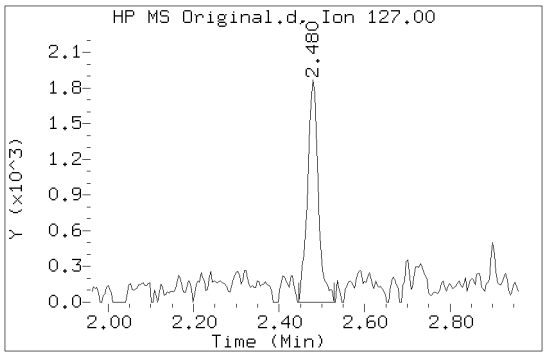
AFTER

MASS
142
AREA
7282
HEIGHT
4145
16-Nov-2022
09:41
linh
pham



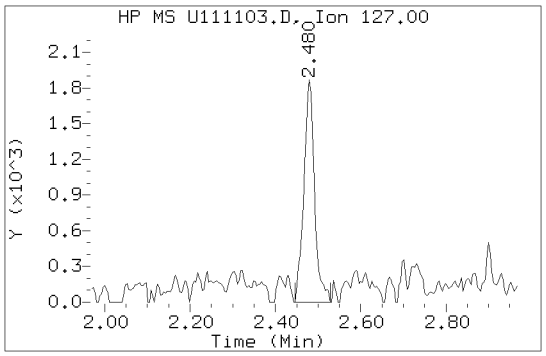
BEFORE

MASS
127
AREA
3331
HEIGHT
1869
16-Nov-2022
09:38
linh
pham



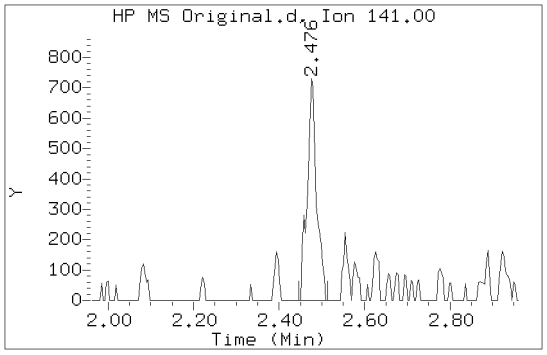
AFTER

MASS
127
AREA
3331
HEIGHT
1869
16-Nov-2022
09:41
linh
pham



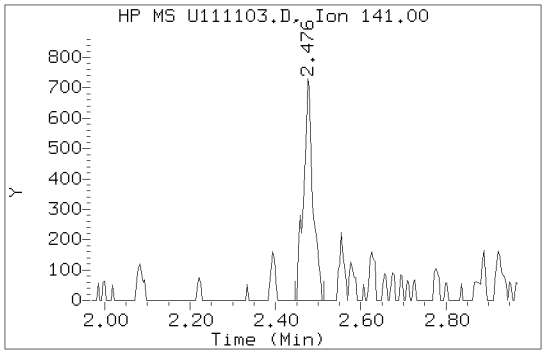
BEFORE

MASS
141
AREA
1140
HEIGHT
730
16-Nov-2022
09:38
linh
pham



AFTER

MASS
141
AREA
1140
HEIGHT
730
16-Nov-2022
09:41
linh
pham

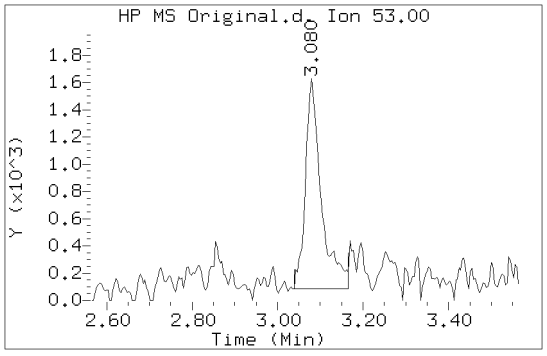


Acrylonitrile (107-13-1)

Reason Code:

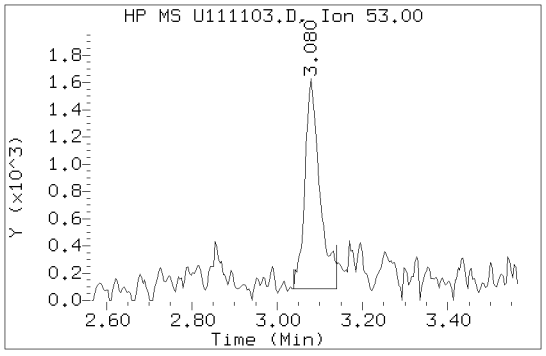
BEFORE

MASS
53
AREA
4003
HEIGHT
1543
16-Nov-2022
09:38
linh
pham



AFTER

MASS
53
AREA
3765
HEIGHT
1543
16-Nov-2022
09:41
linh
pham

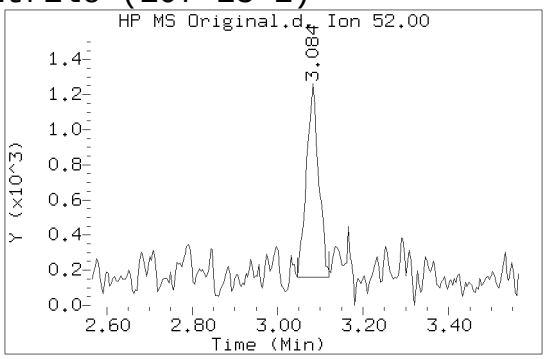


Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

Acrylonitrile (107-13-1)

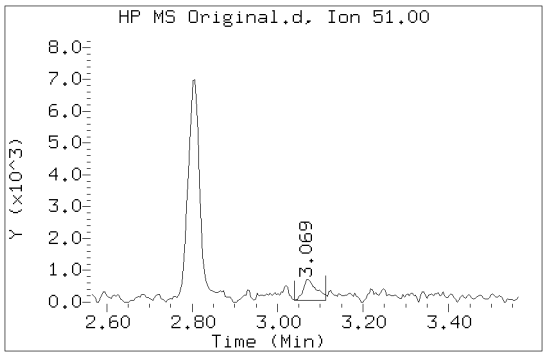
BEFORE

MASS
52
AREA
2193
HEIGHT
1103
16-Nov-2022
09:38
linh
pham



BEFORE

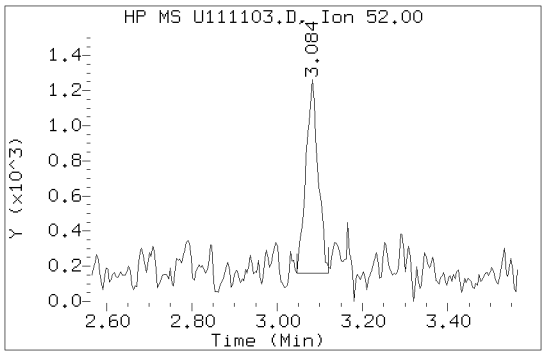
MASS
51
AREA
1433
HEIGHT
651
16-Nov-2022
09:38
linh
pham



Reason Code:

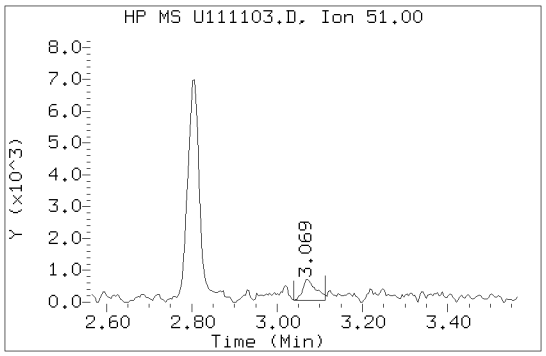
AFTER

MASS
52
AREA
2193
HEIGHT
1103
16-Nov-2022
09:41
linh
pham



AFTER

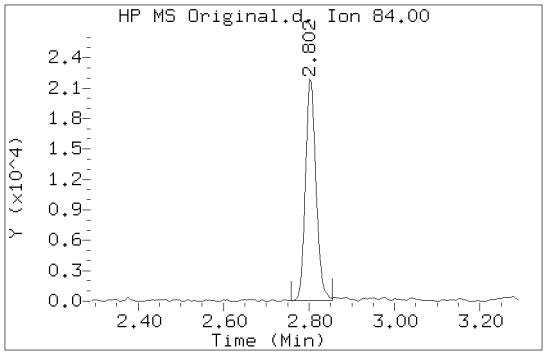
MASS
51
AREA
1433
HEIGHT
651
16-Nov-2022
09:41
linh
pham



Methylene Chloride (75-09-2)

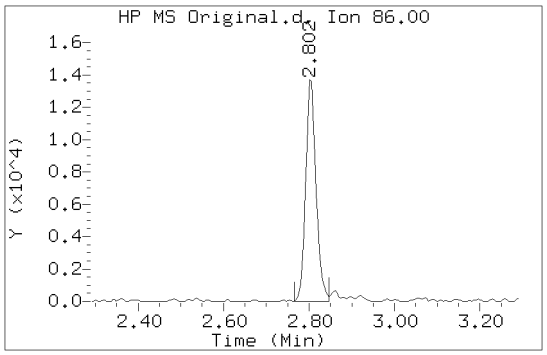
BEFORE

MASS
84
AREA
38413
HEIGHT
21860
16-Nov-2022
09:38
linh
pham



BEFORE

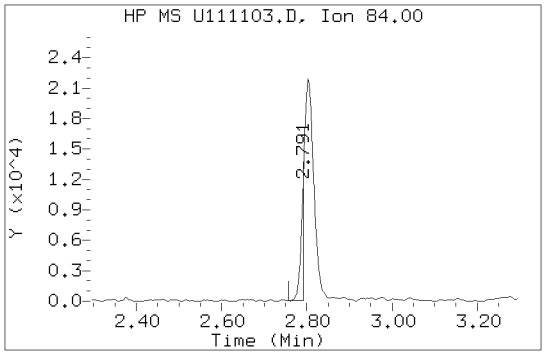
MASS
86
AREA
23611
HEIGHT
13710
16-Nov-2022
09:38
linh
pham



Reason Code:

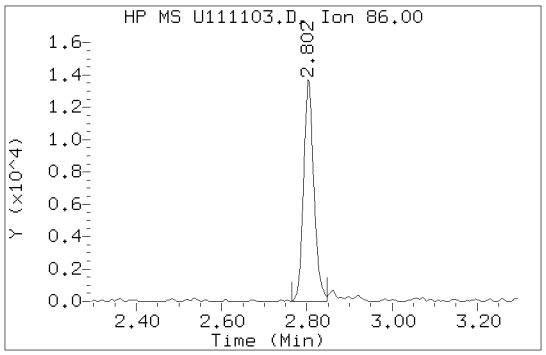
AFTER

MASS
84
AREA
5802
HEIGHT
11796
16-Nov-2022
09:41
linh
pham



AFTER

MASS
86
AREA
23611
HEIGHT
13710
16-Nov-2022
09:41
linh
pham



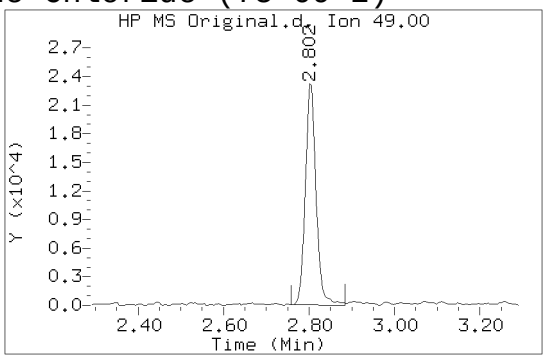
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

Methylene Chloride (75-09-2)

Reason Code:

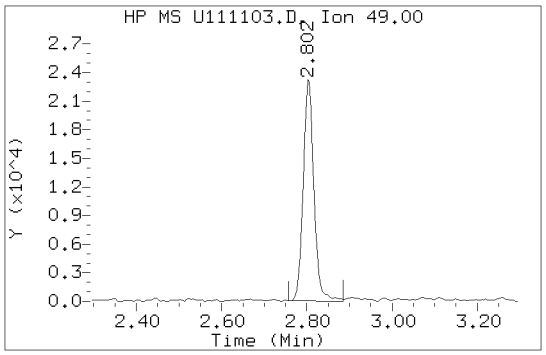
BEFORE

MASS
49
AREA
41352
HEIGHT
23207
16-Nov-2022
09:38
linh
pham



AFTER

MASS
49
AREA
41352
HEIGHT
23207
16-Nov-2022
09:41
linh
pham

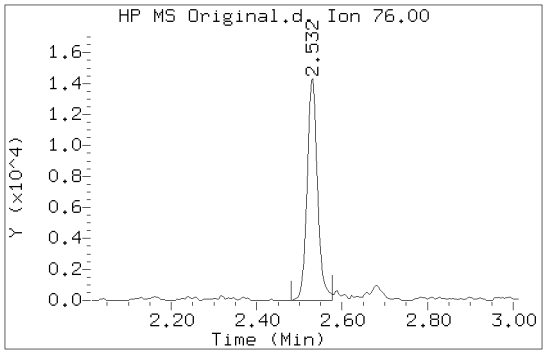


Carbon Disulfide (75-15-0)

Reason Code:

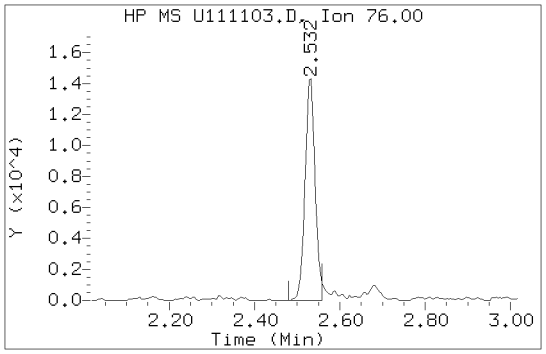
BEFORE

MASS
76
AREA
24625
HEIGHT
14312
16-Nov-2022
09:38
linh
pham



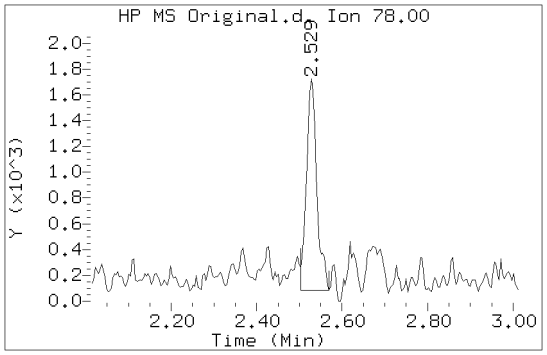
AFTER

MASS
76
AREA
23979
HEIGHT
14312
16-Nov-2022
09:41
linh
pham



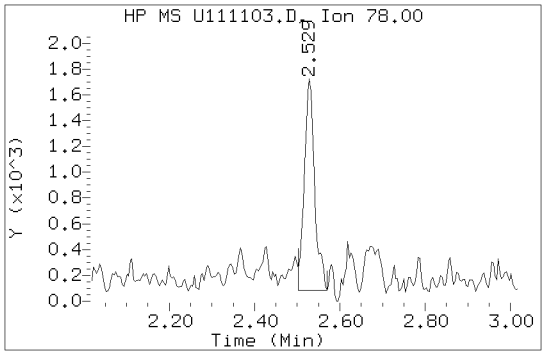
BEFORE

MASS
78
AREA
2830
HEIGHT
1637
16-Nov-2022
09:38
linh
pham



AFTER

MASS
78
AREA
2830
HEIGHT
1637
16-Nov-2022
09:41
linh
pham

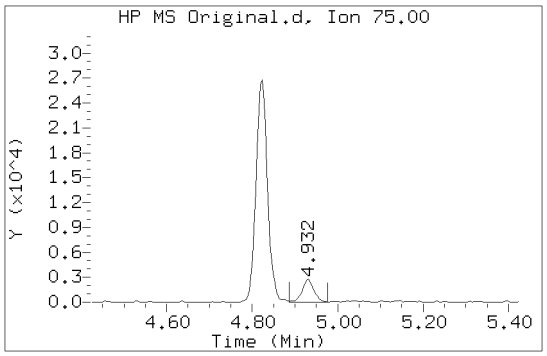


1,1-Dichloropropene (563-58-6)

Reason Code:

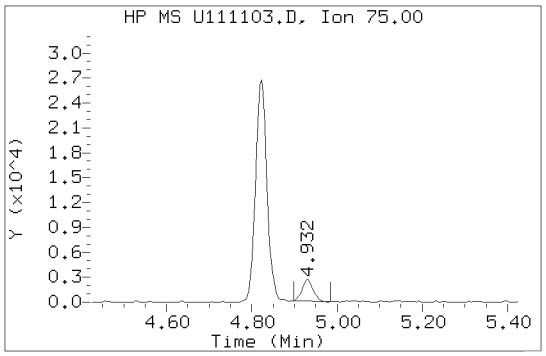
BEFORE

MASS
75
AREA
5310
HEIGHT
2778
16-Nov-2022
09:38
linh
pham



AFTER

MASS
75
AREA
4644
HEIGHT
2659
16-Nov-2022
09:41
linh
pham



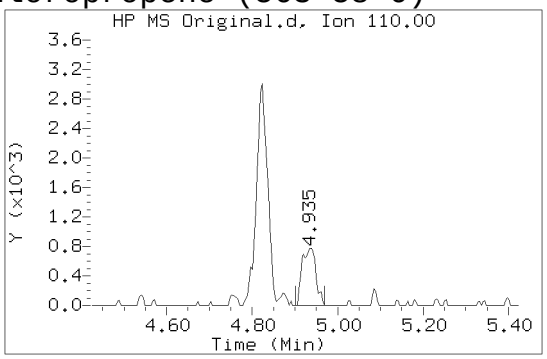
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

1,1-Dichloropropene (563-58-6)

Reason Code:

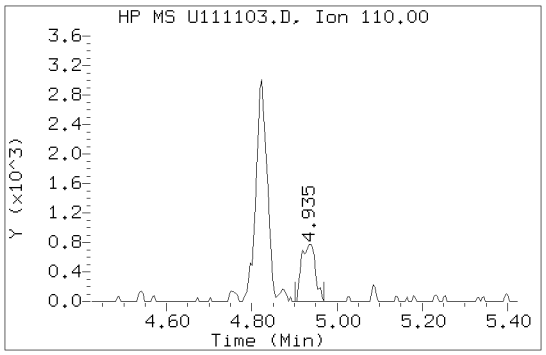
BEFORE

MASS
110
AREA
1773
HEIGHT
776
16-Nov-2022
09:38
linh
pham



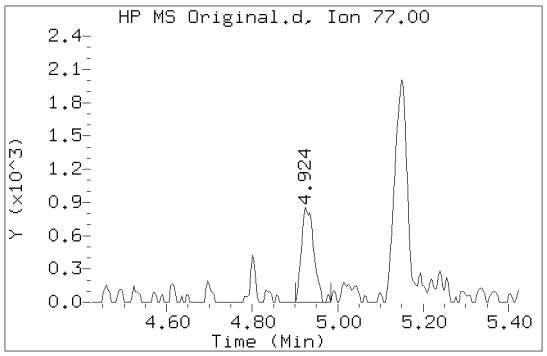
AFTER

MASS
110
AREA
1773
HEIGHT
776
16-Nov-2022
09:41
linh
pham



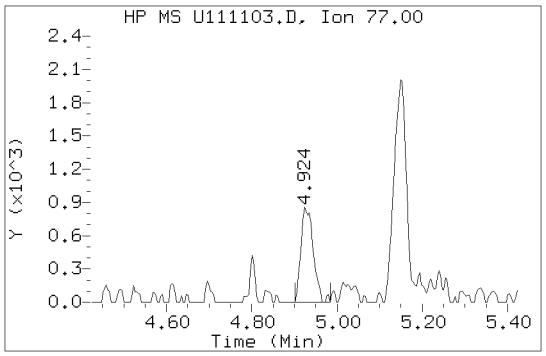
BEFORE

MASS
77
AREA
1749
HEIGHT
856
16-Nov-2022
09:38
linh
pham



AFTER

MASS
77
AREA
1749
HEIGHT
856
16-Nov-2022
09:41
linh
pham

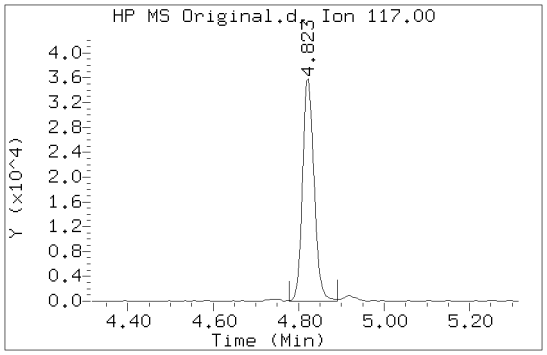


Carbon Tetrachloride (56-23-5)

Reason Code:

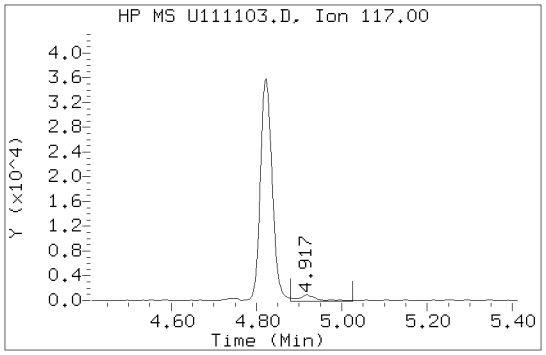
BEFORE

MASS
117
AREA
68937
HEIGHT
35816
16-Nov-2022
09:38
linh
pham



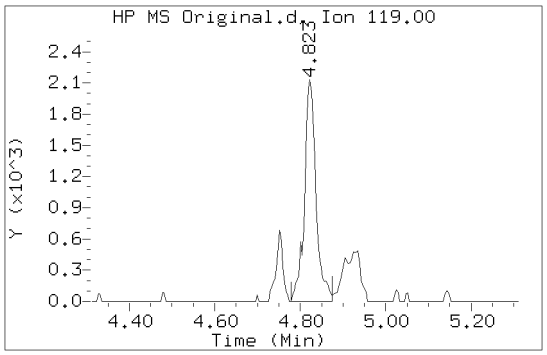
AFTER

MASS
117
AREA
3171
HEIGHT
1078
16-Nov-2022
09:41
linh
pham



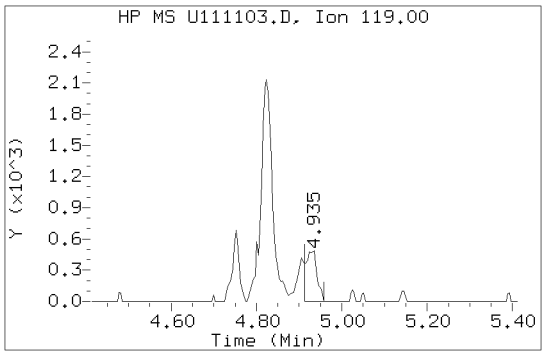
BEFORE

MASS
119
AREA
4044
HEIGHT
2131
16-Nov-2022
09:38
linh
pham



AFTER

MASS
119
AREA
893
HEIGHT
487
16-Nov-2022
09:41
linh
pham

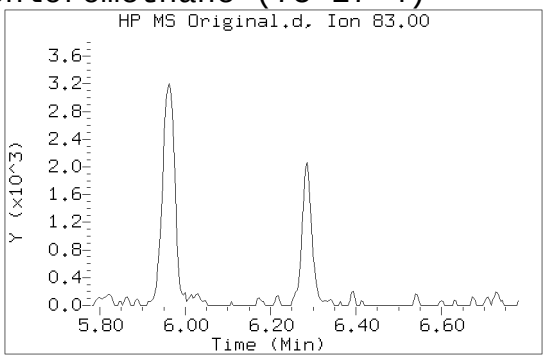


Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

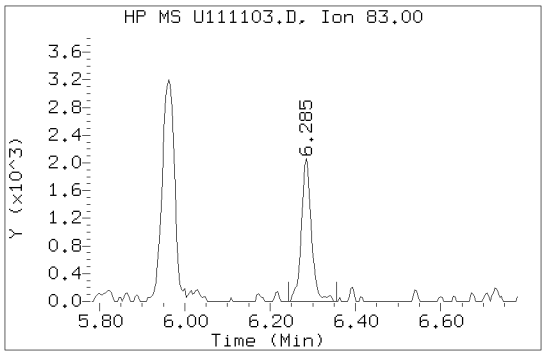
Bromodichloromethane (75-27-4)

Reason Code:

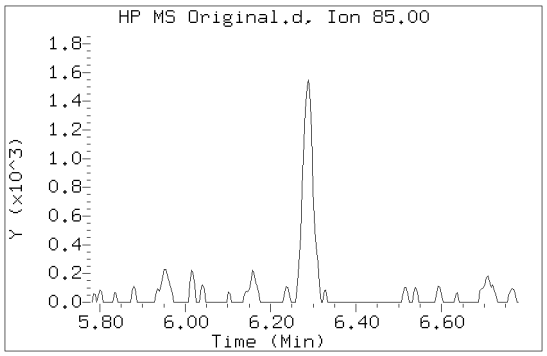
BEFORE
MASS
83
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



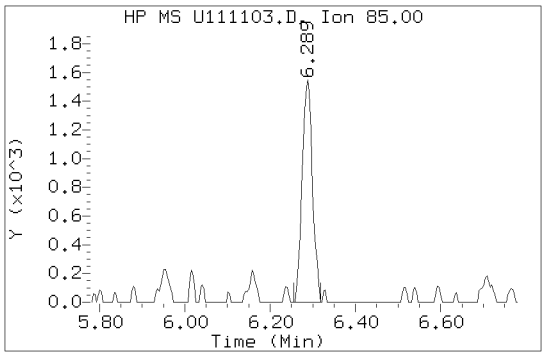
AFTER
MASS
83
AREA
3457
HEIGHT
2066
16-Nov-2022
09:41
linh
pham



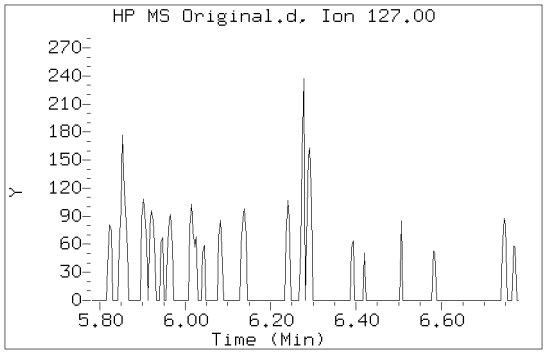
BEFORE
MASS
85
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



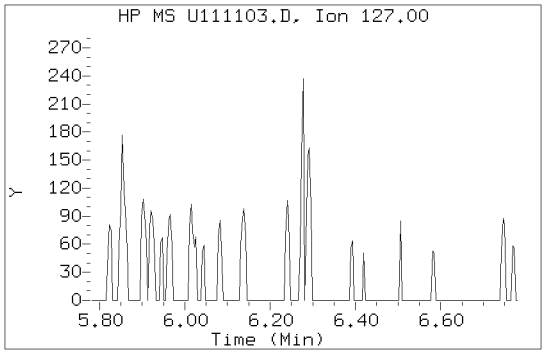
AFTER
MASS
85
AREA
2670
HEIGHT
1548
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
127
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



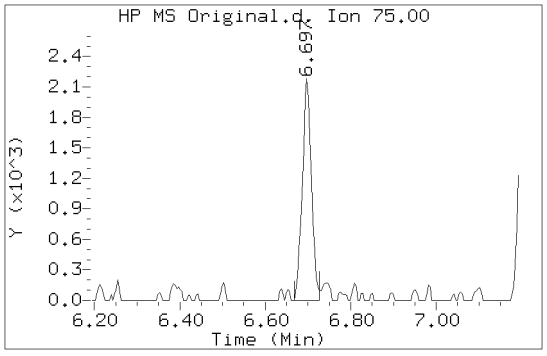
AFTER
MASS
127
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham



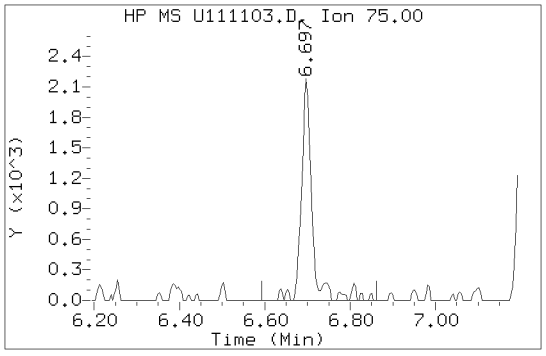
cis-1,3-Dichloropropene (10061-01-5)

Reason Code:

BEFORE
MASS
75
AREA
3321
HEIGHT
2181
16-Nov-2022
09:38
linh
pham



AFTER
MASS
75
AREA
3916
HEIGHT
2181
16-Nov-2022
09:41
linh
pham



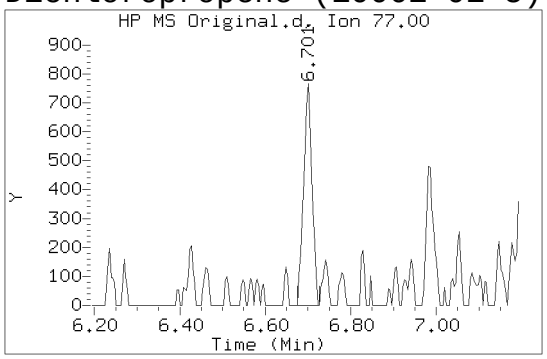
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

cis-1,3-Dichloropropene (10061-01-5)

Reason Code:

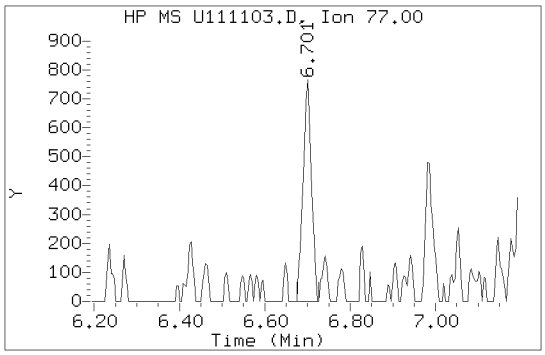
BEFORE

MASS
77
AREA
1071
HEIGHT
766
16-Nov-2022
09:38
linh
pham



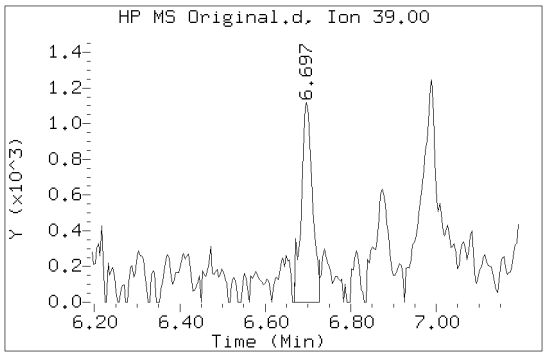
AFTER

MASS
77
AREA
1071
HEIGHT
766
16-Nov-2022
09:41
linh
pham



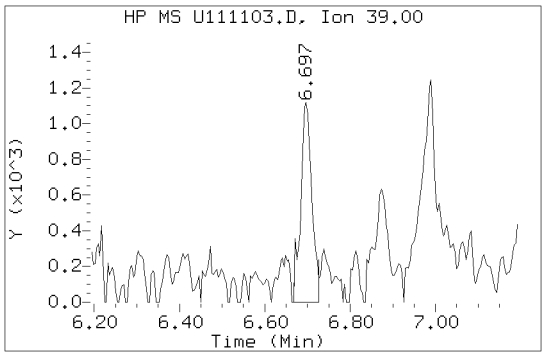
BEFORE

MASS
39
AREA
2078
HEIGHT
1121
16-Nov-2022
09:38
linh
pham



AFTER

MASS
39
AREA
2078
HEIGHT
1121
16-Nov-2022
09:41
linh
pham

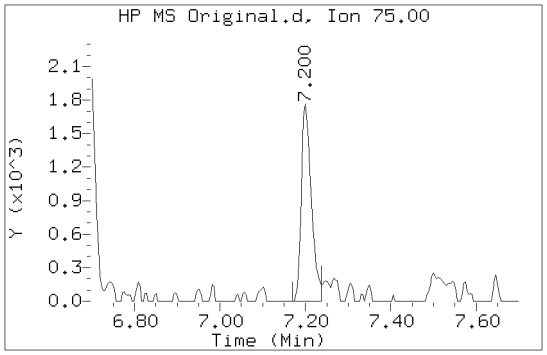


trans-1,3-Dichloropropene (10061-02-6)

Reason Code:

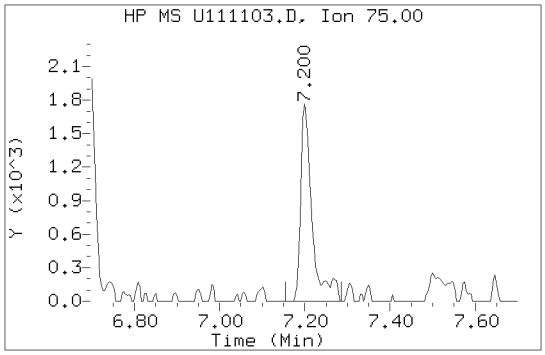
BEFORE

MASS
75
AREA
2943
HEIGHT
1769
16-Nov-2022
09:38
linh
pham



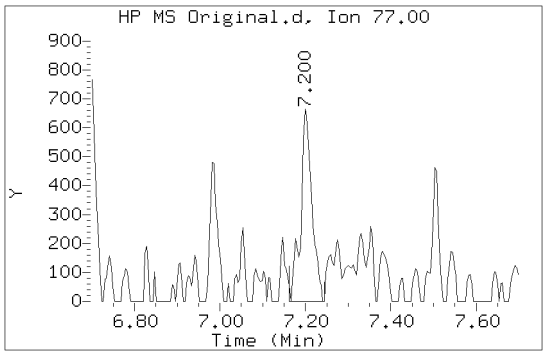
AFTER

MASS
75
AREA
3354
HEIGHT
1769
16-Nov-2022
09:41
linh
pham



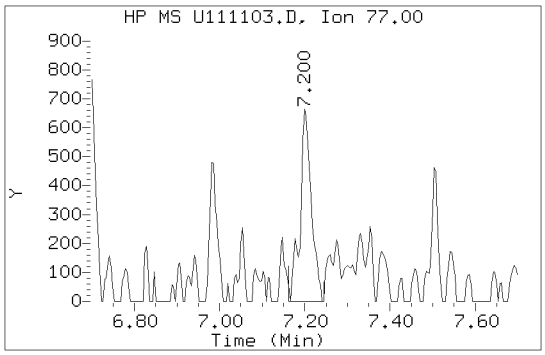
BEFORE

MASS
77
AREA
1239
HEIGHT
664
16-Nov-2022
09:38
linh
pham



AFTER

MASS
77
AREA
1239
HEIGHT
664
16-Nov-2022
09:41
linh
pham



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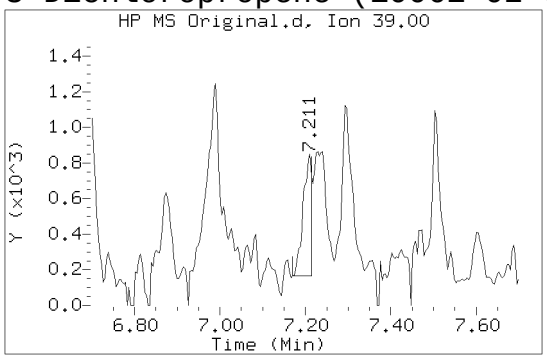
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

trans-1,3-Dichloropropene (10061-02-6)

Reason Code:

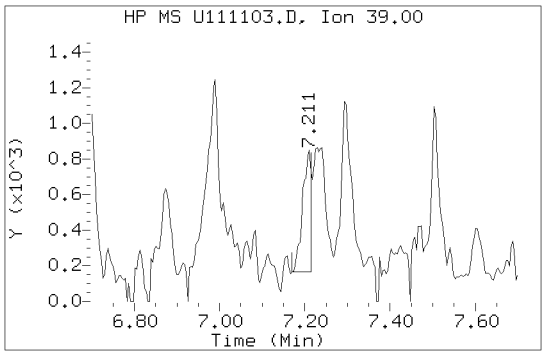
BEFORE

MASS
39
AREA
933
HEIGHT
685
16-Nov-2022
09:38
linh
pham



AFTER

MASS
39
AREA
933
HEIGHT
685
16-Nov-2022
09:41
linh
pham

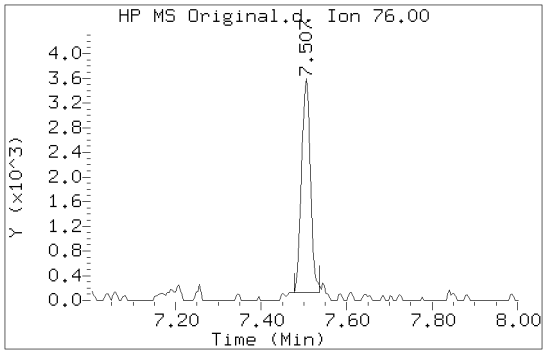


1,3-Dichloropropane (142-28-9)

Reason Code:

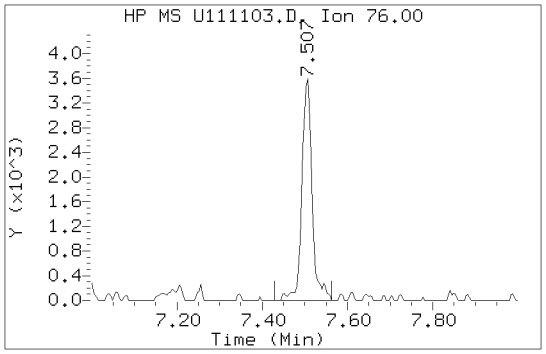
BEFORE

MASS
76
AREA
5190
HEIGHT
3467
16-Nov-2022
09:38
linh
pham



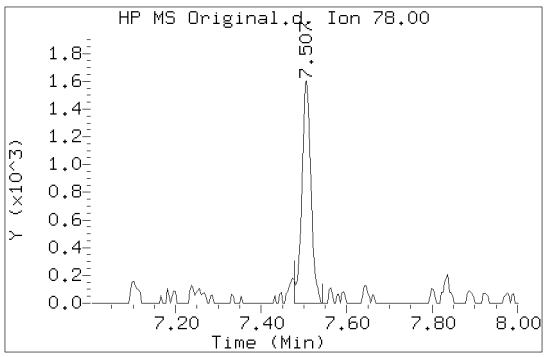
AFTER

MASS
76
AREA
6083
HEIGHT
3594
16-Nov-2022
09:41
linh
pham



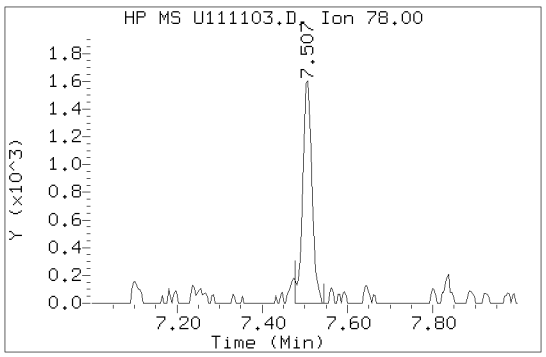
BEFORE

MASS
78
AREA
2453
HEIGHT
1603
16-Nov-2022
09:38
linh
pham



AFTER

MASS
78
AREA
2453
HEIGHT
1603
16-Nov-2022
09:41
linh
pham

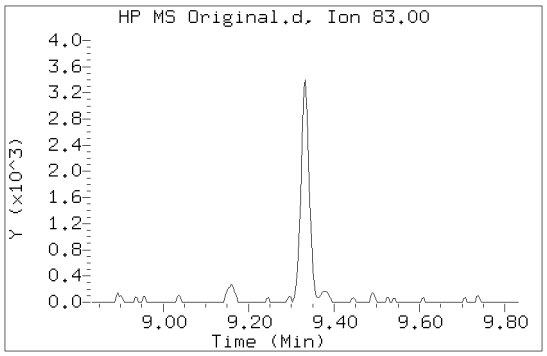


1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

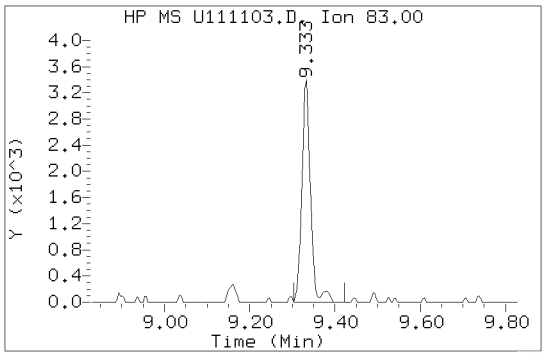
BEFORE

MASS
83
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
83
AREA
4895
HEIGHT
3397
16-Nov-2022
09:41
linh
pham



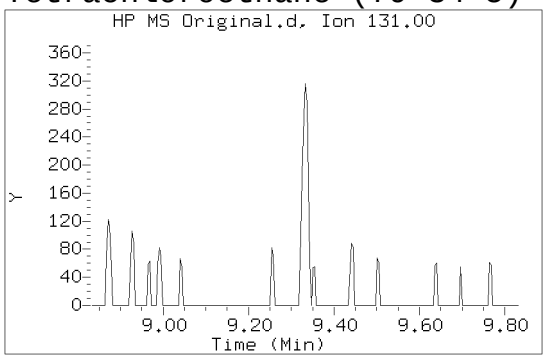
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

1,1,2,2-Tetrachloroethane (79-34-5)

Reason Code:

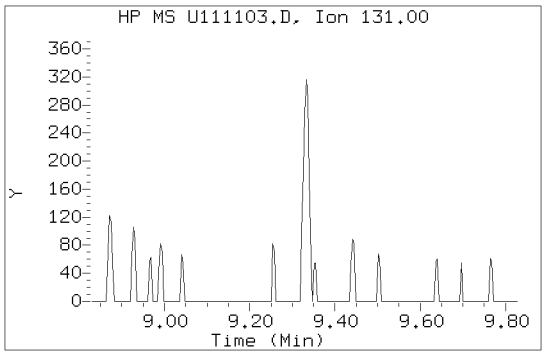
BEFORE

MASS
131
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



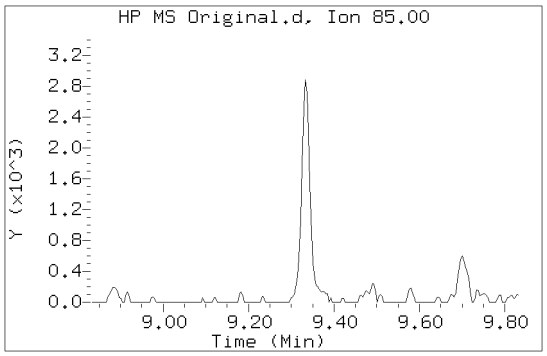
AFTER

MASS
131
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham



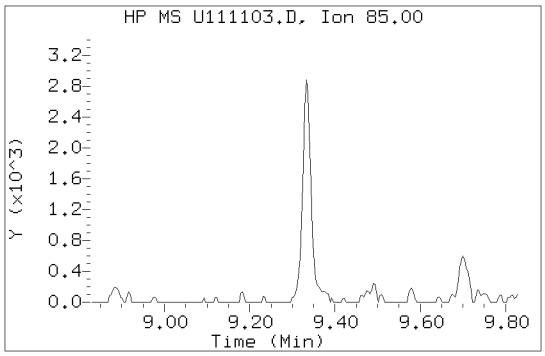
BEFORE

MASS
85
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
85
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham

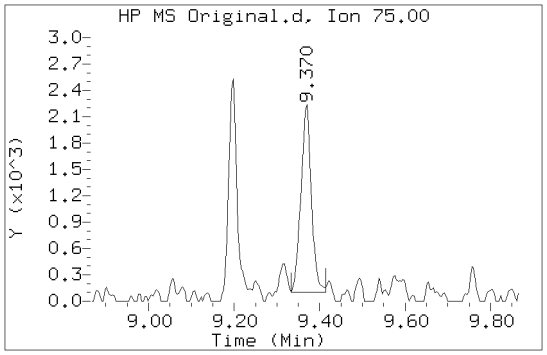


1,2,3-Trichloropropane (96-18-4)

Reason Code:

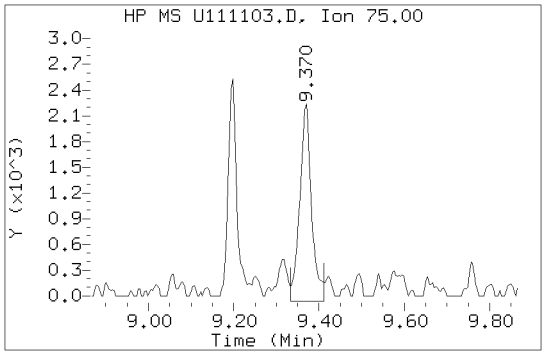
BEFORE

MASS
75
AREA
3690
HEIGHT
2137
16-Nov-2022
09:38
linh
pham



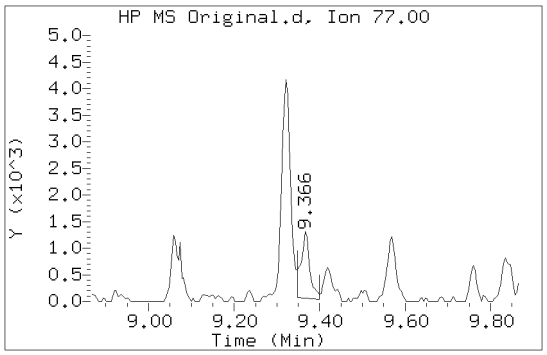
AFTER

MASS
75
AREA
4509
HEIGHT
2305
16-Nov-2022
09:41
linh
pham



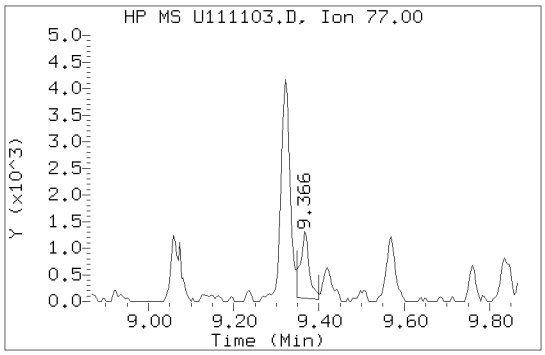
BEFORE

MASS
77
AREA
1865
HEIGHT
1254
16-Nov-2022
09:38
linh
pham



AFTER

MASS
77
AREA
1865
HEIGHT
1254
16-Nov-2022
09:41
linh
pham



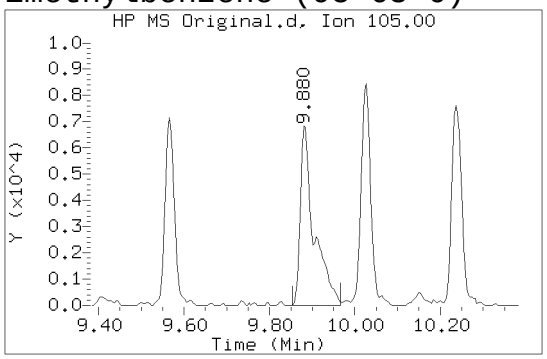
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

1,2,4-Trimethylbenzene (95-63-6)

Reason Code:

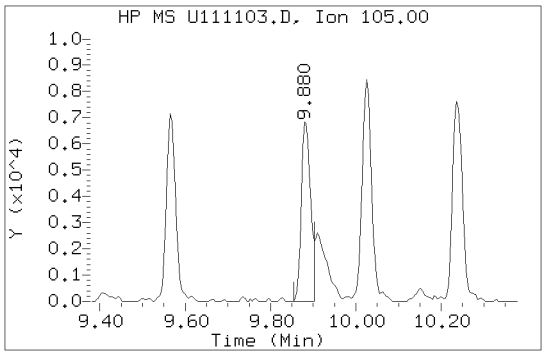
BEFORE

MASS
105
AREA
15568
HEIGHT
6826
16-Nov-2022
09:38
linh
pham



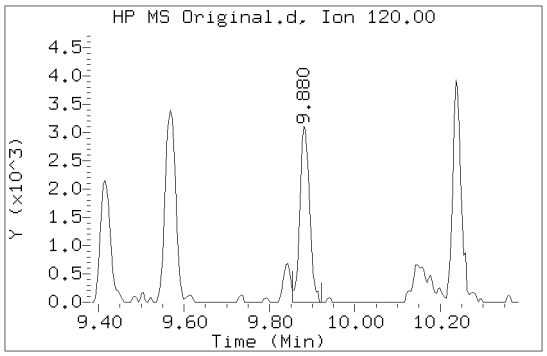
AFTER

MASS
105
AREA
10584
HEIGHT
6826
16-Nov-2022
09:41
linh
pham



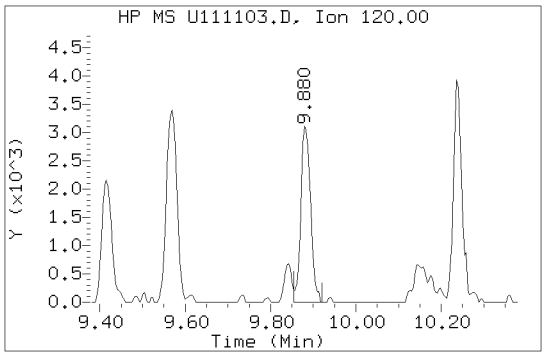
BEFORE

MASS
120
AREA
5048
HEIGHT
3109
16-Nov-2022
09:38
linh
pham



AFTER

MASS
120
AREA
5048
HEIGHT
3109
16-Nov-2022
09:41
linh
pham

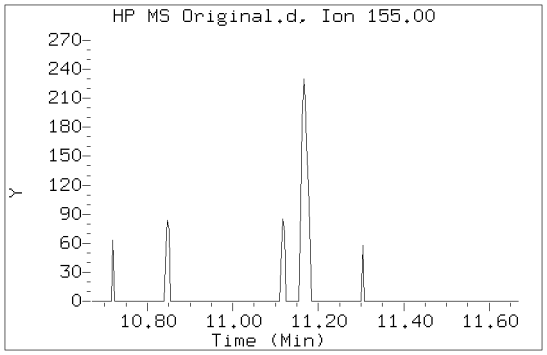


1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

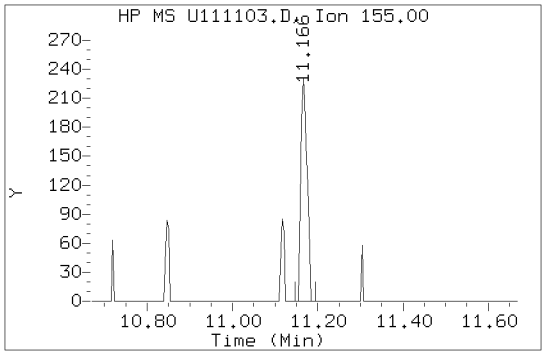
BEFORE

MASS
155
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



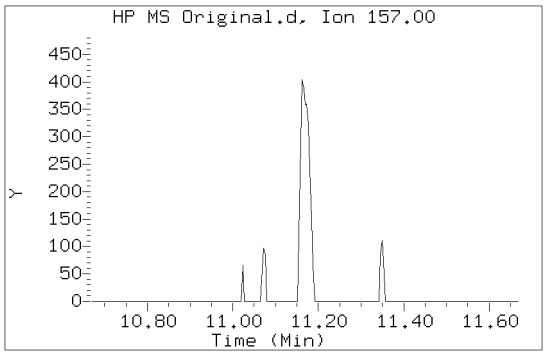
AFTER

MASS
155
AREA
243
HEIGHT
230
16-Nov-2022
09:41
linh
pham



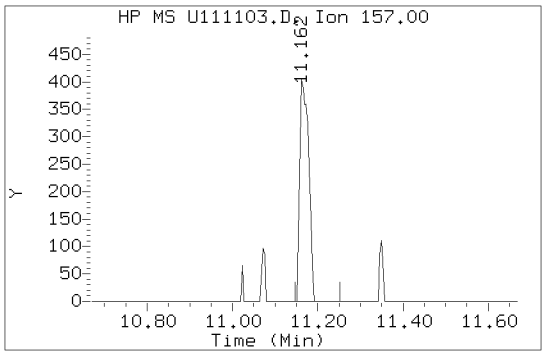
BEFORE

MASS
157
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
157
AREA
607
HEIGHT
404
16-Nov-2022
09:41
linh
pham



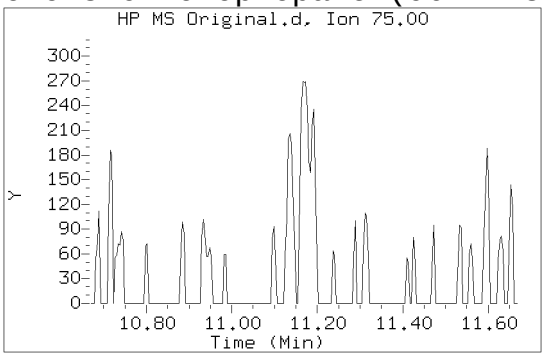
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

1,2-Dibromo-3-Chloropropane (96-12-8)

Reason Code:

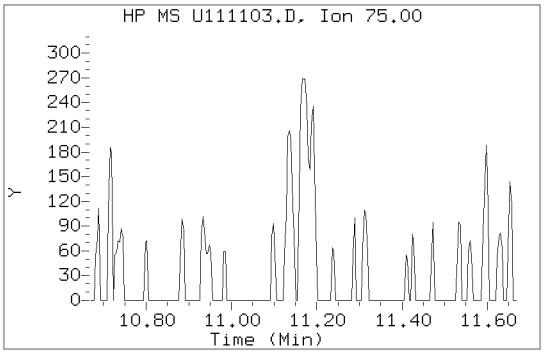
BEFORE

MASS
75
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
75
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham

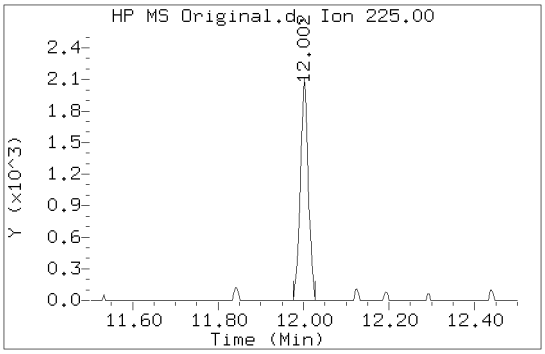


Hexachlorobutadiene (87-68-3)

Reason Code:

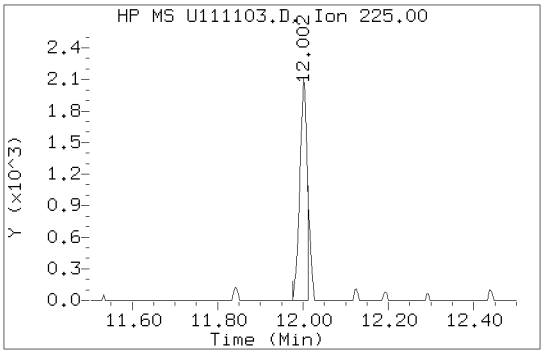
BEFORE

MASS
225
AREA
2814
HEIGHT
2107
16-Nov-2022
09:38
linh
pham



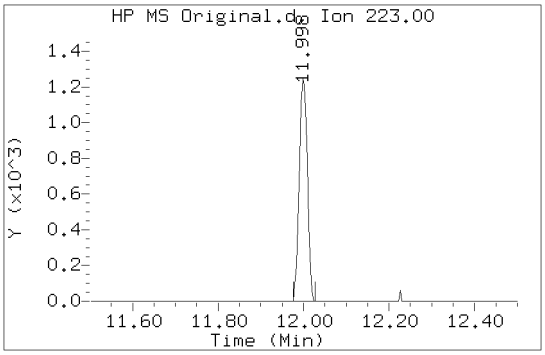
AFTER

MASS
225
AREA
2560
HEIGHT
2107
16-Nov-2022
09:41
linh
pham



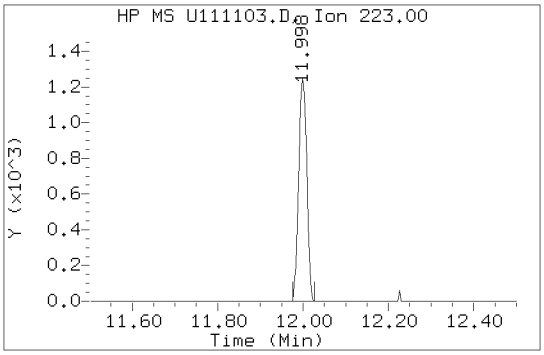
BEFORE

MASS
223
AREA
1709
HEIGHT
1245
16-Nov-2022
09:38
linh
pham



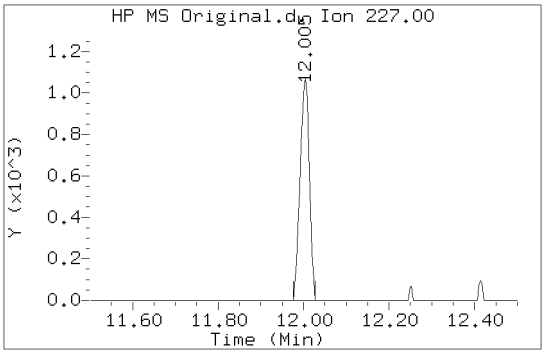
AFTER

MASS
223
AREA
1709
HEIGHT
1245
16-Nov-2022
09:41
linh
pham



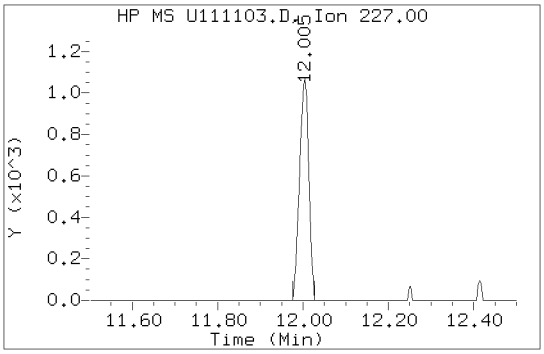
BEFORE

MASS
227
AREA
1660
HEIGHT
1069
16-Nov-2022
09:38
linh
pham



AFTER

MASS
227
AREA
1660
HEIGHT
1069
16-Nov-2022
09:41
linh
pham

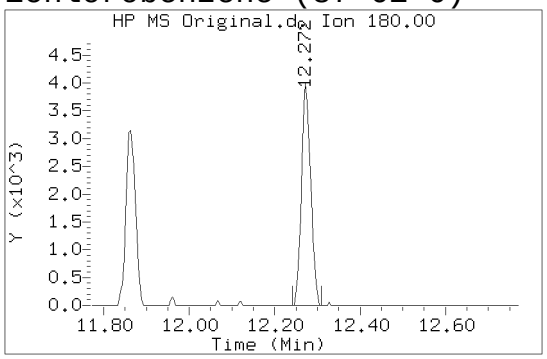


Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

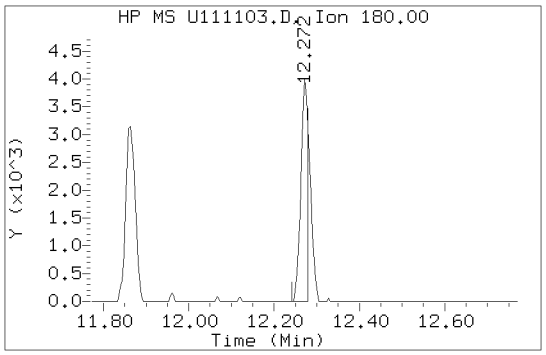
1,2,3-Trichlorobenzene (87-61-6)

Reason Code:

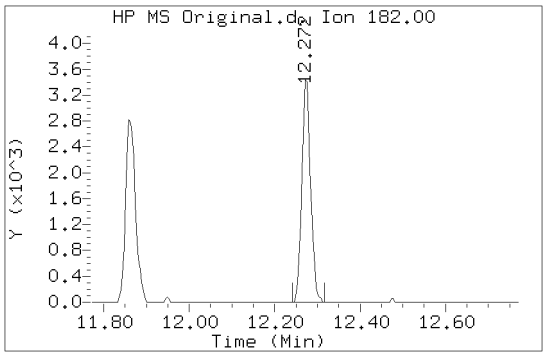
BEFORE
MASS
180
AREA
6119
HEIGHT
3988
16-Nov-2022
09:38
linh
pham



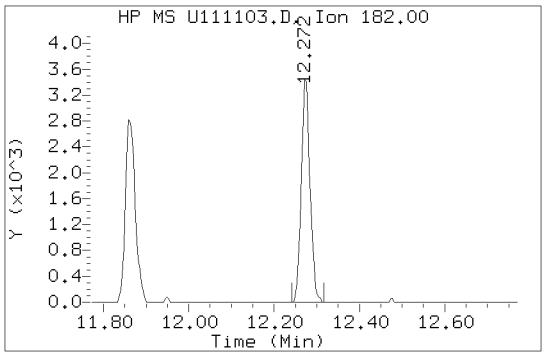
AFTER
MASS
180
AREA
4534
HEIGHT
3988
16-Nov-2022
09:41
linh
pham



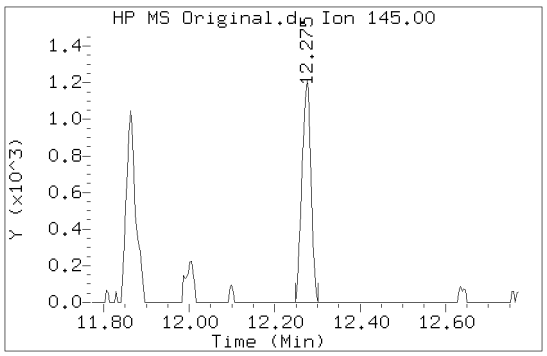
BEFORE
MASS
182
AREA
5029
HEIGHT
3435
16-Nov-2022
09:38
linh
pham



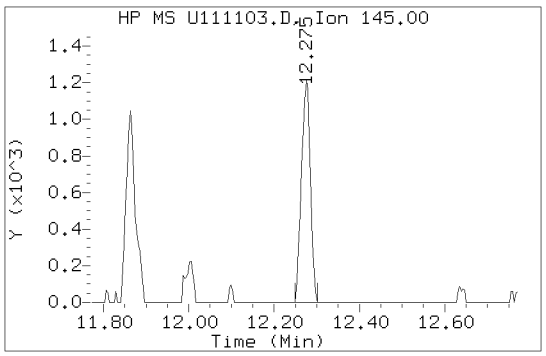
AFTER
MASS
182
AREA
5029
HEIGHT
3435
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
145
AREA
1818
HEIGHT
1211
16-Nov-2022
09:38
linh
pham



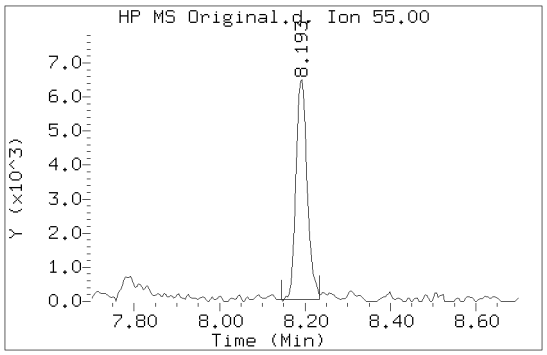
AFTER
MASS
145
AREA
1818
HEIGHT
1211
16-Nov-2022
09:41
linh
pham



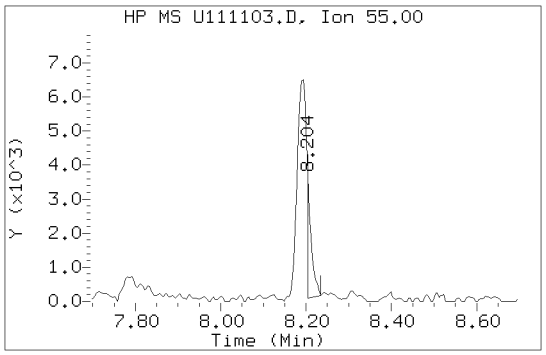
1-Chlorohexane (544-10-5)

Reason Code:

BEFORE
MASS
55
AREA
12120
HEIGHT
6454
16-Nov-2022
09:38
linh
pham



AFTER
MASS
55
AREA
2433
HEIGHT
3655
16-Nov-2022
09:41
linh
pham



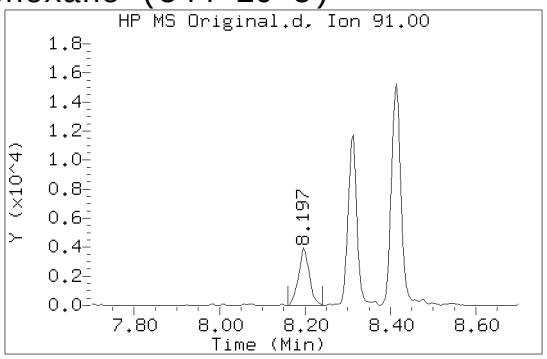
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

1-Chlorohexane (544-10-5)

Reason Code:

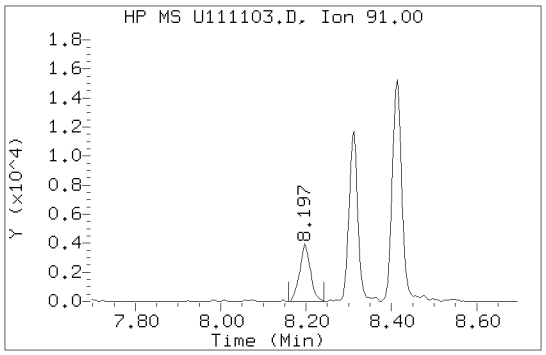
BEFORE

MASS
91
AREA
7045
HEIGHT
3958
16-Nov-2022
09:38
linh
pham



AFTER

MASS
91
AREA
7045
HEIGHT
3958
16-Nov-2022
09:41
linh
pham

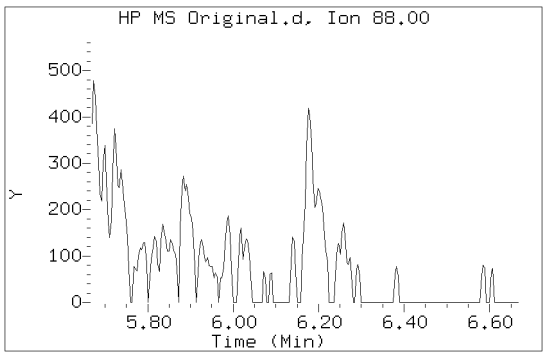


1,4-Dioxane ()

Reason Code:

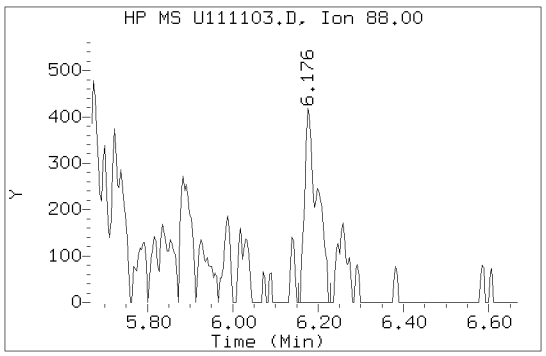
BEFORE

MASS
88
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



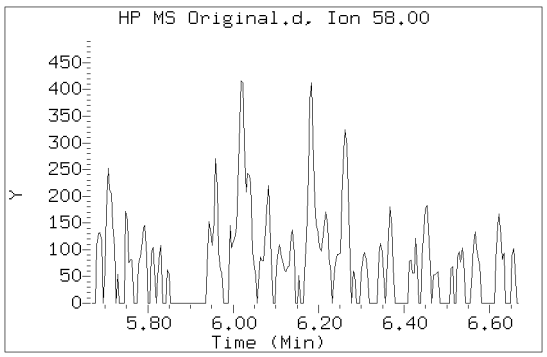
AFTER

MASS
88
AREA
872
HEIGHT
419
16-Nov-2022
09:41
linh
pham



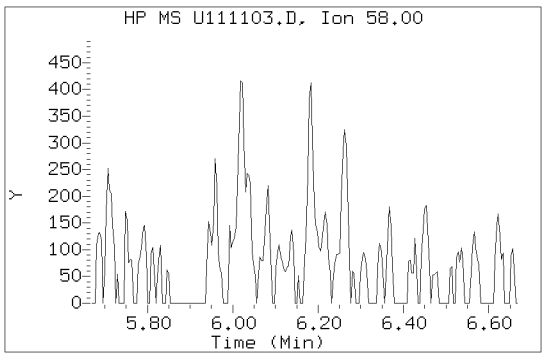
BEFORE

MASS
58
AREA
0
HEIGHT
0
16-Nov-2022
09:38
linh
pham



AFTER

MASS
58
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham

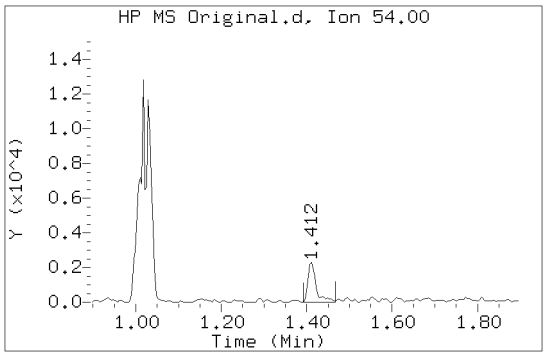


1,3-Butadiene (106-99-0)

Reason Code:

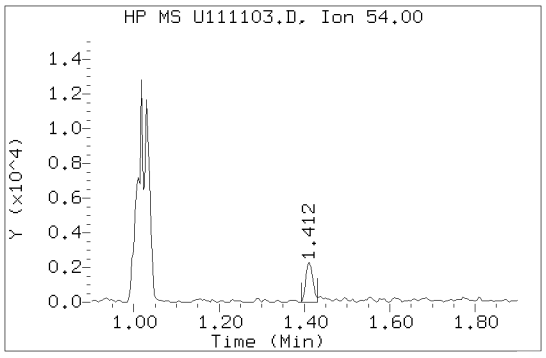
BEFORE

MASS
54
AREA
3093
HEIGHT
2295
16-Nov-2022
09:38
linh
pham



AFTER

MASS
54
AREA
2660
HEIGHT
2295
16-Nov-2022
09:41
linh
pham



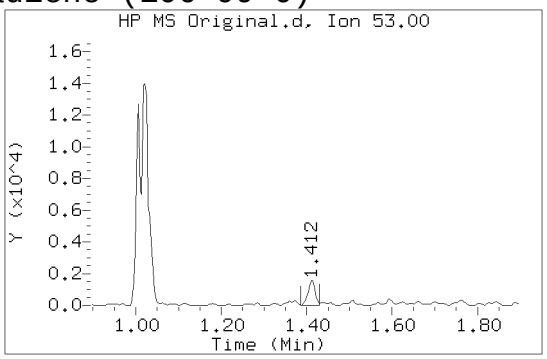
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

1,3-Butadiene (106-99-0)

Reason Code:

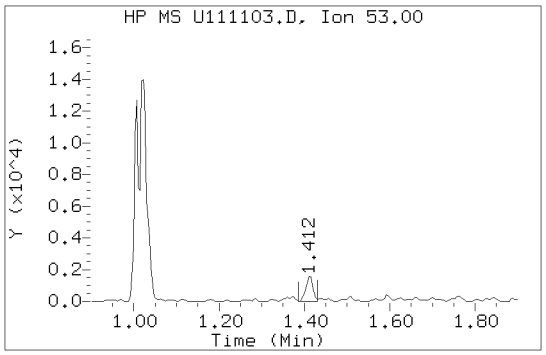
BEFORE

MASS
53
AREA
1823
HEIGHT
1593
16-Nov-2022
09:38
linh
pham



AFTER

MASS
53
AREA
1823
HEIGHT
1593
16-Nov-2022
09:41
linh
pham

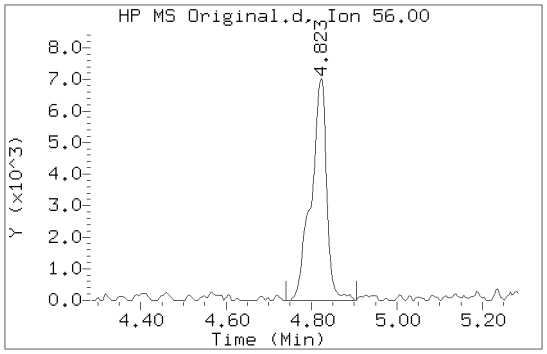


Cyclohexane (110-82-7)

Reason Code:

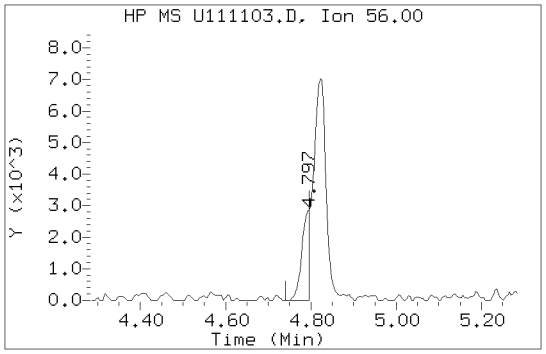
BEFORE

MASS
56
AREA
17813
HEIGHT
7023
16-Nov-2022
09:38
linh
pham



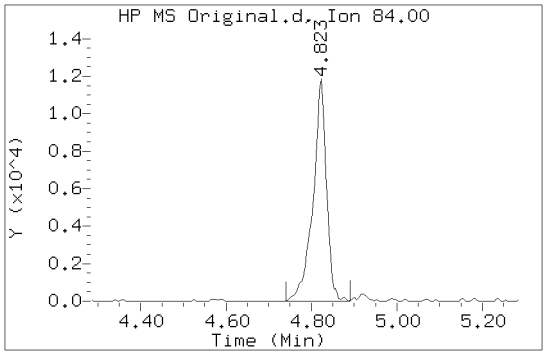
AFTER

MASS
56
AREA
3722
HEIGHT
2858
16-Nov-2022
09:41
linh
pham



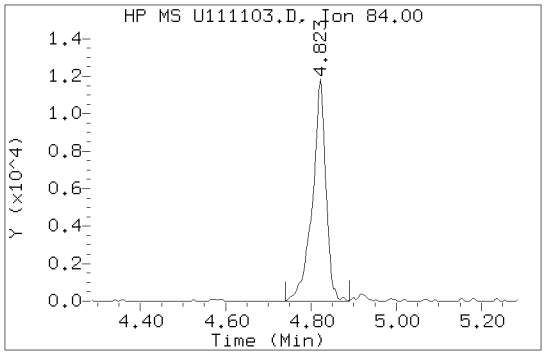
BEFORE

MASS
84
AREA
25973
HEIGHT
11857
16-Nov-2022
09:38
linh
pham



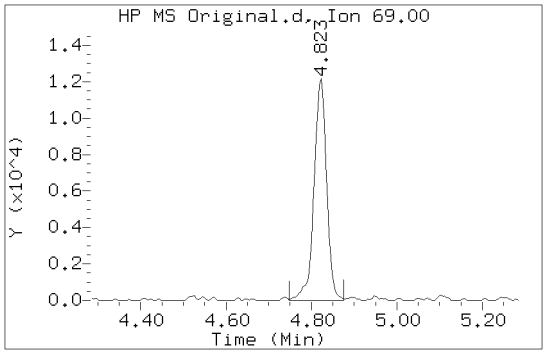
AFTER

MASS
84
AREA
25973
HEIGHT
11857
16-Nov-2022
09:41
linh
pham



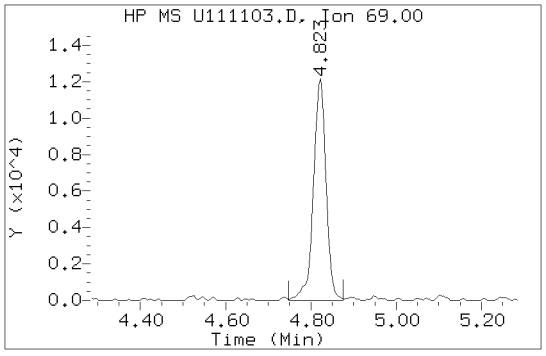
BEFORE

MASS
69
AREA
24994
HEIGHT
12164
16-Nov-2022
09:38
linh
pham



AFTER

MASS
69
AREA
24994
HEIGHT
12164
16-Nov-2022
09:41
linh
pham

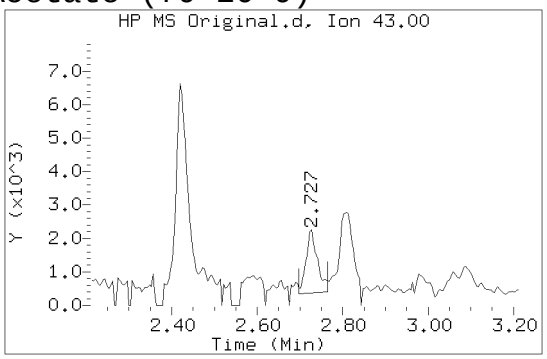


Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

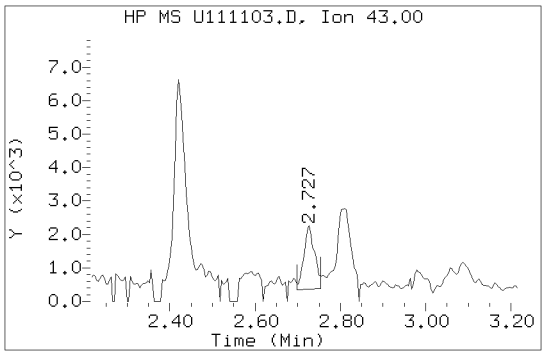
Methyl Acetate (79-20-9)

Reason Code:

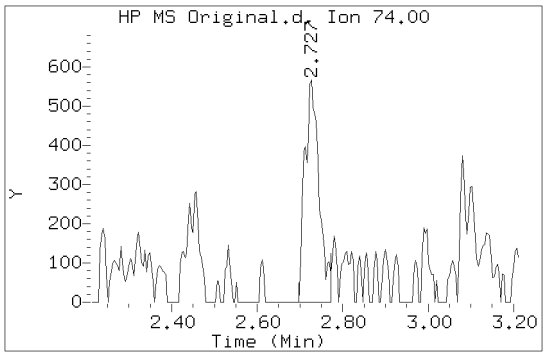
BEFORE
MASS
43
AREA
3615
HEIGHT
1898
16-Nov-2022
09:38
linh
pham



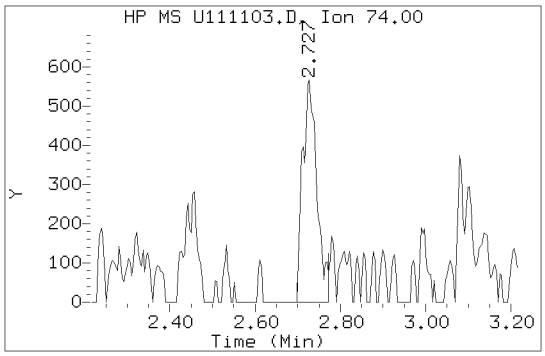
AFTER
MASS
43
AREA
3374
HEIGHT
1899
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
74
AREA
1334
HEIGHT
567
16-Nov-2022
09:38
linh
pham



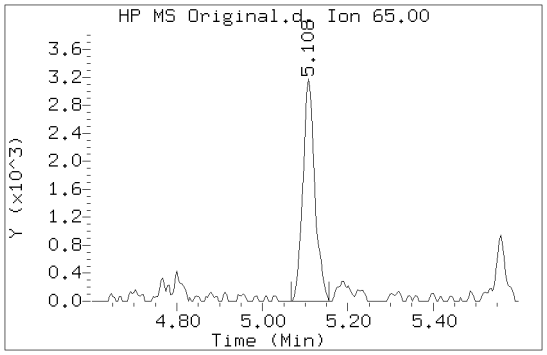
AFTER
MASS
74
AREA
1334
HEIGHT
567
16-Nov-2022
09:41
linh
pham



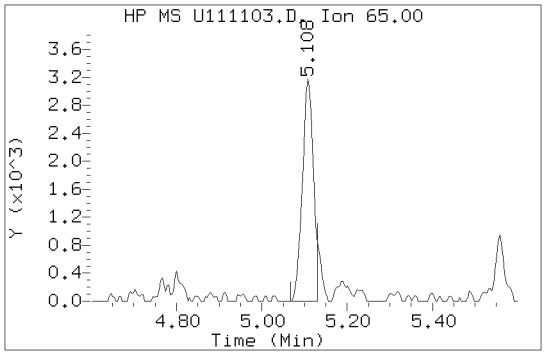
1,2-Dichloroethane-d4 (17060-07-0)

Reason Code:

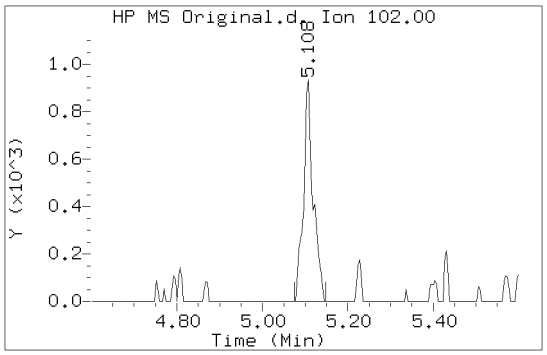
BEFORE
MASS
65
AREA
6294
HEIGHT
3178
16-Nov-2022
09:38
linh
pham



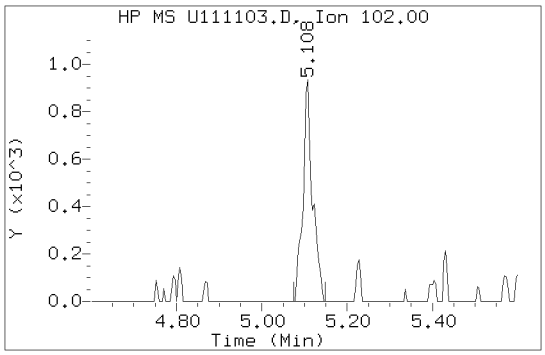
AFTER
MASS
65
AREA
5818
HEIGHT
3178
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
102
AREA
1491
HEIGHT
935
16-Nov-2022
09:38
linh
pham



AFTER
MASS
102
AREA
1491
HEIGHT
935
16-Nov-2022
09:41
linh
pham

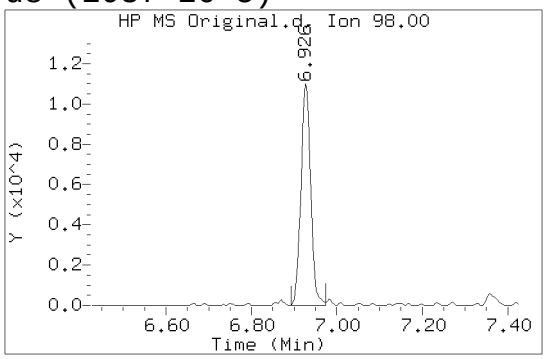


Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111103.D
Inj Date : 11-NOV-2022 12:18
InstruID : VOA9.i
LabSampID : VSTD000.5

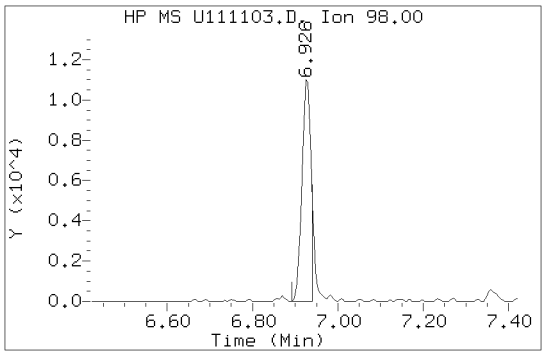
Toluene-d8 (2037-26-5)

Reason Code:

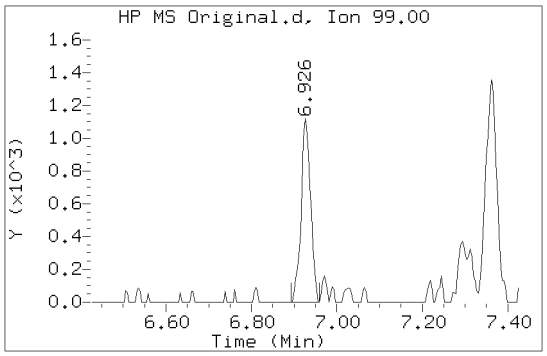
BEFORE
MASS
98
AREA
17806
HEIGHT
11007
16-Nov-2022
09:38
linh
pham



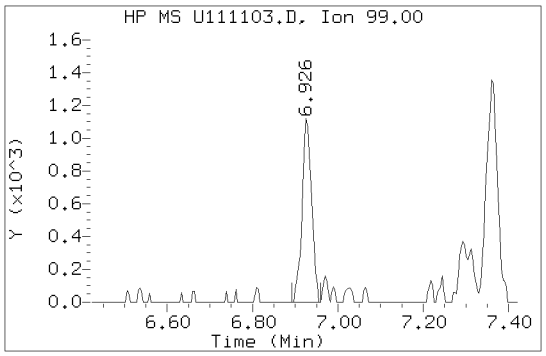
AFTER
MASS
98
AREA
16258
HEIGHT
11007
16-Nov-2022
09:41
linh
pham



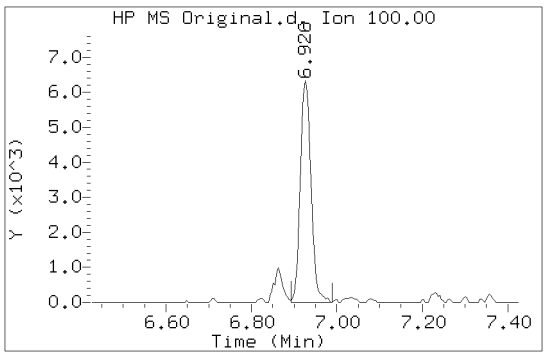
BEFORE
MASS
99
AREA
1755
HEIGHT
1121
16-Nov-2022
09:38
linh
pham



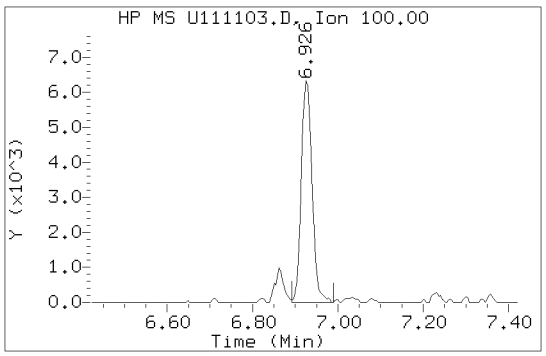
AFTER
MASS
99
AREA
1755
HEIGHT
1121
16-Nov-2022
09:41
linh
pham



BEFORE
MASS
100
AREA
11346
HEIGHT
6332
16-Nov-2022
09:38
linh
pham



AFTER
MASS
100
AREA
11346
HEIGHT
6332
16-Nov-2022
09:41
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D Page 1
Report Date: 16-Nov-2022 09:41

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D
Lab Smp Id: VSTD001 Client Smp ID: VSTD001
Inj Date : 11-NOV-2022 13:03
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD001;VSTD001;1;3;
Misc Info : 180315V9;WATER;0;1;
Comment   :
Method   : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\8260C.m
Meth Date : 16-Nov-2022 09:41 VOA9.i Quant Type: ISTD
Cal Date : 11-NOV-2022 12:18 Cal File: U111103.D
Als bottle: 5 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 08260V9.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1	Pentafluorobenzene	168	4.819	4.819	(1.000)	737196	50.0000	
2	Dichlorodifluoromethane	85	1.160	1.160	(0.241)	5077	1.00000	1.18
3	Chloromethane	50	1.295	1.295	(0.269)	9584	1.00000	1.42(M)
5	Vinyl Chloride	62	1.374	1.374	(0.285)	7177	1.00000	0.95
6	Bromomethane	94	1.621	1.621	(0.337)	7086	1.00000	0.28(M)
7	Chloroethane	64	1.696	1.696	(0.352)	4673	1.00000	0.85
8	Trichlorofluoromethane	101	1.895	1.895	(0.393)	8110	1.00000	0.82
9	Acrolein	56	2.266	2.266	(0.470)	1204	2.00000	3.25(M)
10	Acetone	43	2.409	2.409	(0.500)	16101	2.00000	(M)
11	1,1-Dichloroethene	96	2.330	2.330	(0.484)	5538	1.00000	0.88
15	Iodomethane	142	2.469	2.469	(0.512)	11703	2.00000	5.58
16	Acrylonitrile	53	3.068	3.068	(0.637)	7529	2.00000	2.19(M)
17	Methylene Chloride	84	2.784	2.784	(0.578)	9340	1.00000	(M)
18	Methyl tert-butyl ether	73	3.083	3.083	(0.640)	23422	1.00000	1.10
19	Carbon Disulfide	76	2.521	2.521	(0.523)	36748	2.00000	2.00
20	trans-1,2-Dichloroethene	96	3.057	3.057	(0.634)	7209	1.00000	1.03
21	Vinyl Acetate	43	3.616	3.616	(0.750)	36522	2.00000	2.01
22	1,1-Dichloroethane	63	3.518	3.518	(0.730)	13372	1.00000	1.08
24	2-Butanone	43	4.272	4.272	(0.886)	5864	2.00000	1.96
26	2,2-Dichloropropane	77	4.182	4.182	(0.868)	5237	1.00000	2.09

27 cis-1,2-Dichloroethene	96	4.197	4.197 (0.871)	9011	1.00000	1.10
28 Chloroform	83	4.575	4.575 (0.949)	13849	1.00000	1.04

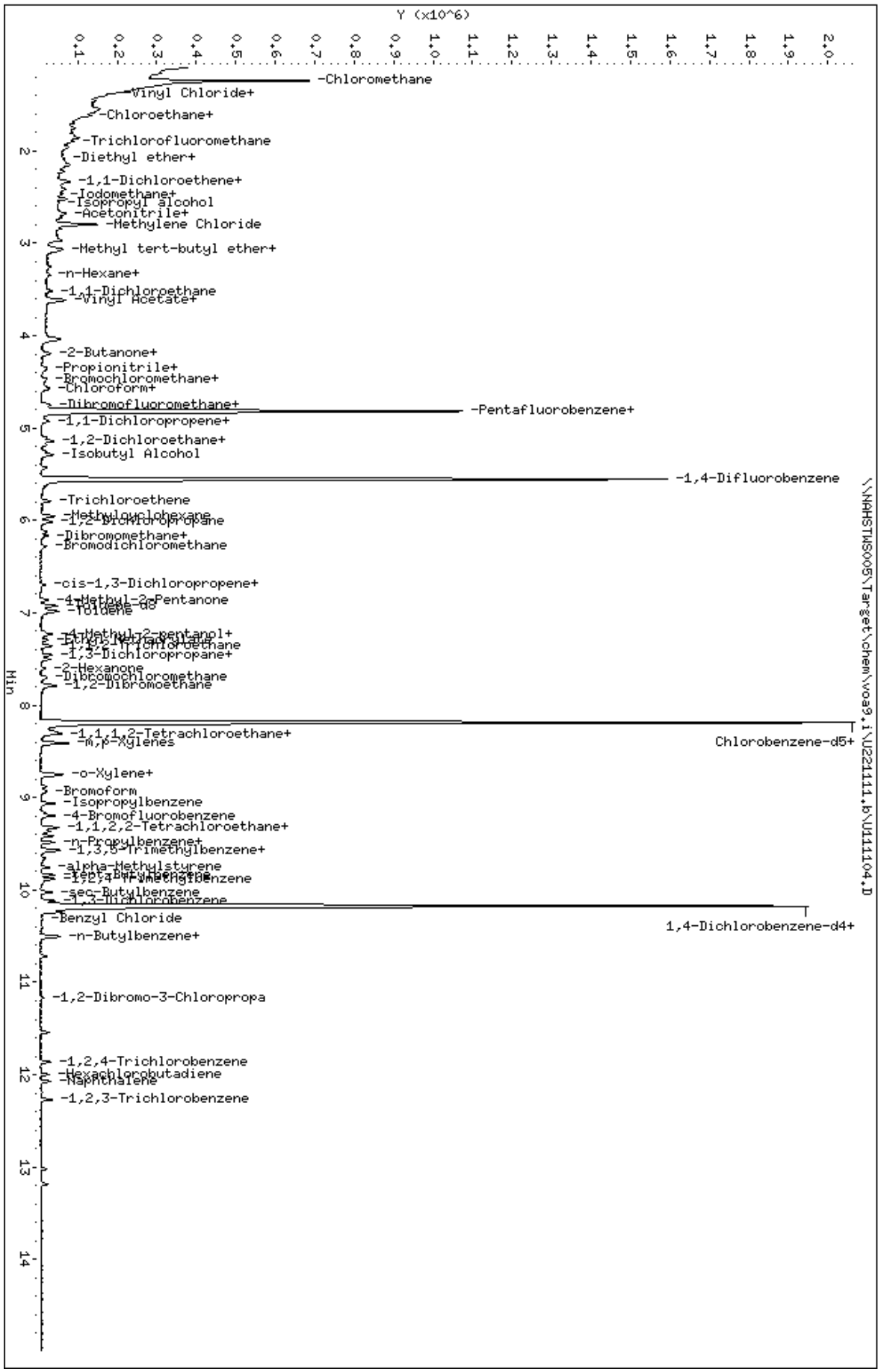
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.470	4.470	(0.928)	4403	1.00000	1.00
$	30 Dibromofluoromethane	113	4.752	4.752	(0.986)	7603	1.00000	0.69
	31 1,1,1-Trichloroethane	97	4.744	4.744	(0.984)	7044	1.00000	0.79
	32 1,1-Dichloropropene	75	4.928	4.928	(0.887)	8022	1.00000	0.92
	33 1,2-Dichloroethane	62	5.183	5.183	(0.933)	10531	1.00000	0.96
	34 Carbon Tetrachloride	117	4.913	4.913	(0.885)	5716	1.00000	1.27(MH)
$	35 1,2-Dichloroethane-d4	65	5.104	5.104	(1.059)	10111	1.00000	0.58
*	36 1,4-Difluorobenzene	114	5.554	5.554	(1.000)	1245336	50.0000	
	37 Benzene	78	5.141	5.141	(0.926)	27560	1.00000	0.93
	38 Trichloroethene	130	5.794	5.794	(1.043)	6814	1.00000	0.84
	39 Bromodichloromethane	83	6.285	6.285	(1.132)	8105	1.00000	0.90
	42 1,2-Dichloropropane	63	6.011	6.011	(1.082)	6730	1.00000	0.90
	44 Dibromomethane	93	6.124	6.124	(1.103)	5482	1.00000	1.01
	45 4-Methyl-2-Pentanone	43	6.858	6.858	(0.838)	12886	2.00000	1.91
	46 cis-1,3-Dichloropropene	75	6.697	6.697	(1.206)	6701	1.00000	3.33
*	47 Chlorobenzene-d5	117	8.189	8.189	(1.000)	1143729	50.0000	
$	48 Toluene-d8	98	6.926	6.926	(0.846)	26676	1.00000	0.98
	50 Toluene	91	6.982	6.982	(0.853)	27702	1.00000	0.91
	51 trans-1,3-Dichloropropene	75	7.203	7.203	(1.297)	5135	1.00000	3.89(M)
	52 2-Hexanone	43	7.601	7.601	(0.928)	6997	2.00000	2.72
	53 1,1,2-Trichloroethane	83	7.357	7.357	(0.898)	6672	1.00000	1.02
	54 1,3-Dichloropropane	76	7.503	7.503	(0.916)	14188	1.00000	1.06
	55 Dibromochloromethane	129	7.694	7.694	(0.940)	5711	1.00000	2.09
	56 Tetrachloroethene	164	7.458	7.458	(0.911)	5833	1.00000	0.88
	57 1,2-Dibromoethane	107	7.788	7.788	(0.951)	7326	1.00000	0.91
	58 1-Chlorohexane	55	8.197	8.197	(1.476)	5434	1.00000	2.37(M)
	59 Chlorobenzene	112	8.212	8.212	(1.003)	21297	1.00000	0.98
	60 1,1,1,2-Tetrachloroethane	131	8.287	8.287	(1.012)	6430	1.00000	0.90
	61 Ethylbenzene	106	8.305	8.305	(1.014)	8918	1.00000	0.89
	62 m,p-Xylenes	106	8.414	8.414	(1.027)	21840	2.00000	1.75(M)
	63 o-Xylene	106	8.751	8.751	(1.069)	10583	1.00000	0.85
	64 Styrene	104	8.766	8.766	(1.070)	14453	1.00000	1.87
	66 Bromoform	173	8.920	8.920	(1.089)	3479	1.00000	2.87(T)
	67 Isopropylbenzene	105	9.063	9.063	(1.107)	24281	1.00000	0.85
	68 1,1,2,2-Tetrachloroethane	83	9.332	9.332	(0.917)	11709	1.00000	1.11
$	69 4-Bromofluorobenzene	95	9.198	9.198	(1.123)	11689	1.00000	1.33
*	70 1,4-Dichlorobenzene-d4	152	10.172	10.172	(1.000)	528554	50.0000	
	71 1,2,3-Trichloropropane	75	9.362	9.362	(0.920)	8791	1.00000	0.96
	73 n-Propylbenzene	91	9.415	9.415	(0.926)	23203	1.00000	0.81
	74 Bromobenzene	156	9.321	9.321	(0.916)	7500	1.00000	0.89
	75 1,3,5-Trimethylbenzene	105	9.565	9.565	(0.940)	18278	1.00000	0.86
	76 2-Chlorotoluene	91	9.486	9.486	(0.933)	18680	1.00000	0.93
	77 4-Chlorotoluene	91	9.580	9.580	(0.942)	20742	1.00000	0.92
	78 tert-Butylbenzene	119	9.839	9.839	(0.967)	15834	1.00000	0.85
	79 1,2,4-Trimethylbenzene	105	9.880	9.880	(0.971)	21443	1.00000	0.96
	81 sec-Butylbenzene	105	10.026	10.026	(0.986)	17948	1.00000	2.43
	82 p-Isopropyltoluene	119	10.150	10.150	(0.998)	16123	1.00000	0.79
	83 1,3-Dichlorobenzene	146	10.120	10.120	(0.995)	14330	1.00000	0.99
	84 1,4-Dichlorobenzene	146	10.195	10.195	(1.002)	16638	1.00000	1.05
	87 n-Butylbenzene	91	10.498	10.498	(1.032)	13013	1.00000	2.91
	88 1,2-Dichlorobenzene	146	10.513	10.513	(1.034)	15124	1.00000	0.99
	89 1,2-Dibromo-3-Chloropropane	155	11.173	11.173	(1.098)	881	1.00000	2.82

90 1,2,4-Trichlorobenzene	180	11.863	11.863 (1.166)	7338	1.00000	0.88
91 Hexachlorobutadiene	225	12.002	12.002 (1.180)	3339	1.00000	2.27

		QUANT SIG					AMOUNTS CAL-AMT	AMOUNTS ON-COL
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ug/l)	(ug/l)
	92 Naphthalene	128	12.073	12.073	(1.187)	19198	1.00000	0.92
	93 1,2,3-Trichlorobenzene	180	12.271	12.271	(1.206)	8147	1.00000	0.98
M	94 1,2-Dichloroethylene (total)	96				16220	2.00000	
M	95 Xylenes (total)	106				32423	3.00000	
	135 1,4-Dioxane	88	6.191	6.191	(1.285)	2641	20.0000	23.58(M)
	141 Cyclohexane	56	4.800	4.800	(0.996)	7250	1.00000	1.07(M)
	138 Freon TF	101	2.330	2.330	(0.484)	4273	1.00000	0.73
	140 1,3-Butadiene	54	1.400	1.400	(0.291)	3837	1.00000	2.37
	147 Methylcyclohexane	55	5.951	5.951	(1.072)	15246	1.00000	0.86
	146 Methyl Acetate	43	2.716	2.716	(0.564)	6996	1.00000	1.15(M)
	148 Tert-Butyl alcohol	59	2.975	2.975	(0.617)	14973	20.0000	20.99(a)

QC Flag Legend

T - Target compound detected outside RT window.
a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.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-Chloromethane
Vinyl Chloride+
-Chloroethane+
-Trichlorofluoromethane
-Diethyl ether+
-1,1-Dichloroethene+
-Iodomethane+
-Isopropyl alcohol
-Acetonitrile+
-Methylene Chloride
-Methyl tert-butyl ether+
-n-Hexane+
-1,1-Dichloroethane
-Vinyl Acetate+
-2-Butanone+
-Propionitrile+
-Bromochloromethane+
-Chloroform+
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-Isobutyl Alcohol
-1,4-Difluorobenzene
-Trichloroethene
-Methylcyclohexane
-1,2-Dichloropropane
-Dibromomethane+
-Bromodichloromethane
-cis-1,3-Dichloropropene+
-4-Methyl-2-Pentanone
-Toluene-d8
-Toluene
-4-Methyl-2-pentanol+
-Ethyl Methacrylate
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
Chlorobenzene-d5+
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene+
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene
-1,2,4-Trimethylbenzene
-sec-Butylbenzene
-1,3-Dichlorobenzene
-Benzyl Chloride
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
Min
1 2 3 4 5 6 7 8 9 10 11 12 13 14
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Client ID: VSTD001
Sample Info: VSTD001;VSTD001;1;3;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9.i
Operator: PC
Column diameter: 0.18
Page 1

Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D
Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

Chloromethane (74-87-3)

Reason Code:

BEFORE
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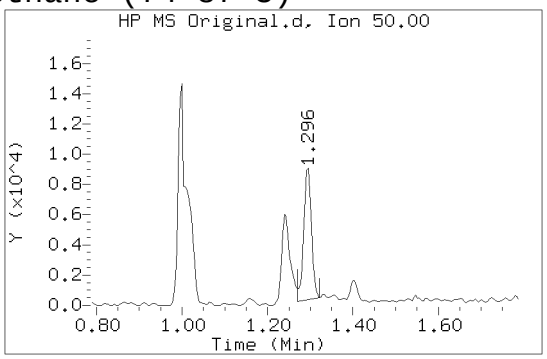
AREA
11103
HEIGHT
8686
16-Nov-2022
09:38
linh
pham



AFTER
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HEIGHT
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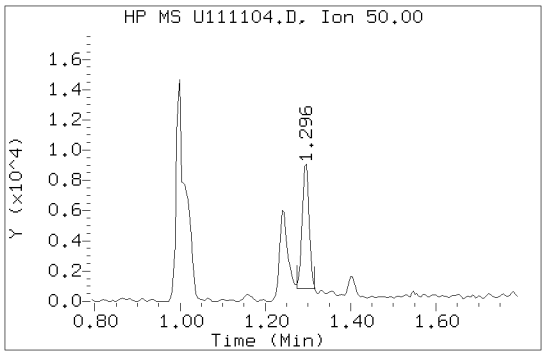
16-Nov-2022
09:41
linh
pham



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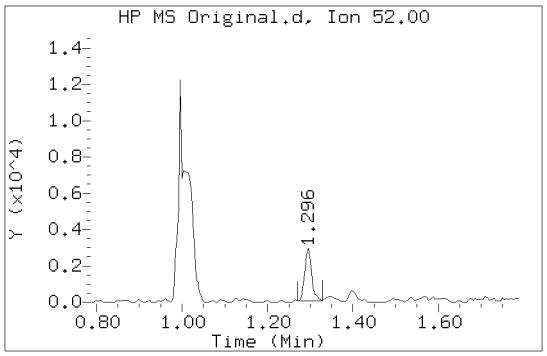

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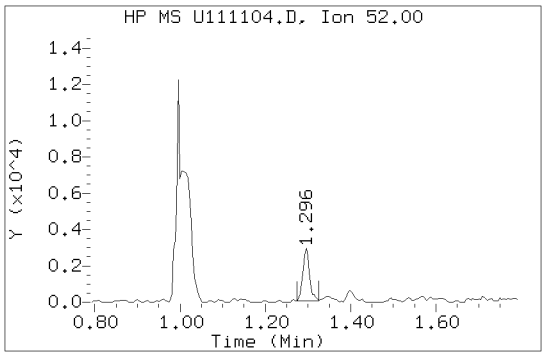

Bromomethane (74-83-9)

Reason Code:

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AREA
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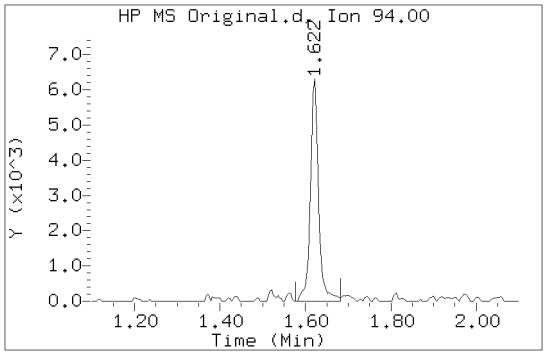

AFTER
MASS
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AREA
7086
HEIGHT
6048
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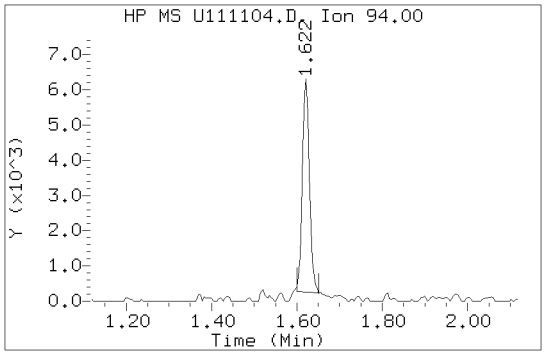
09:41
linh
pham



BEFORE
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AREA
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09:38
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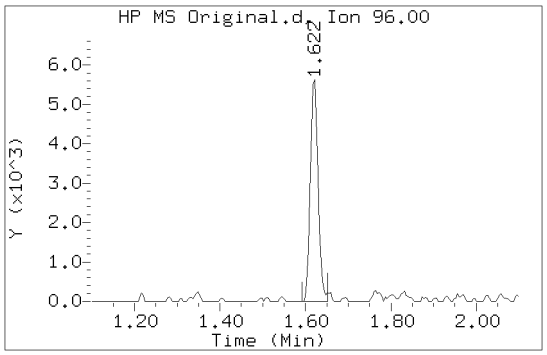

AFTER
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AREA
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HEIGHT
5627
16-Nov-2022
09:41
linh
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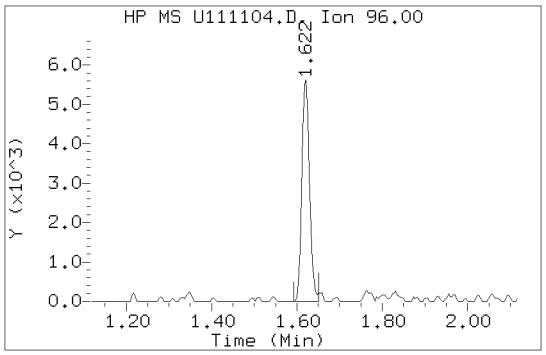

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Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

Acrolein (107-02-8)

Reason Code:

BEFORE

MASS
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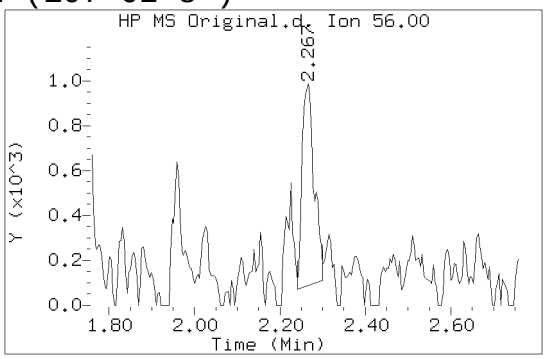
AREA
1804
HEIGHT
898
16-Nov-2022
09:38
linh
pham



AFTER

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09:41
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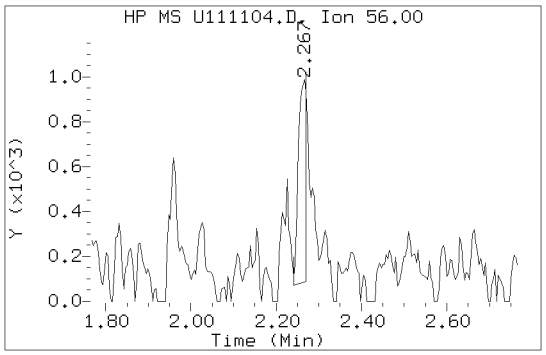

BEFORE

MASS
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HEIGHT
768
16-Nov-2022
09:38
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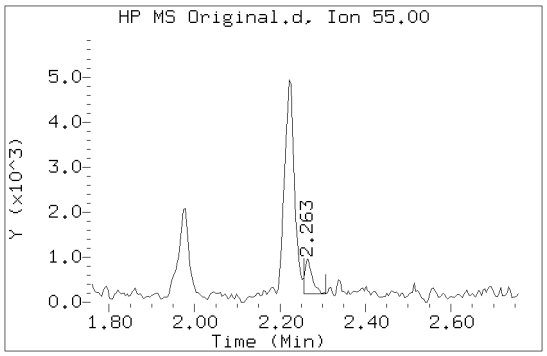

AFTER

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16-Nov-2022
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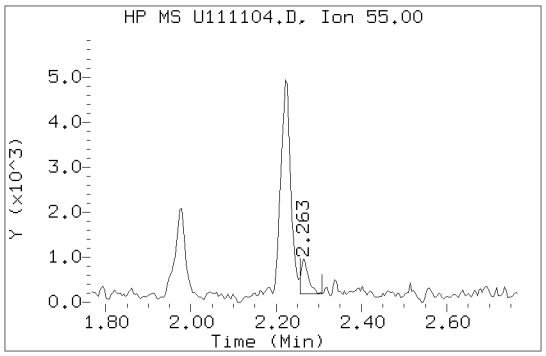

Acetone (67-64-1)

Reason Code:

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16-Nov-2022
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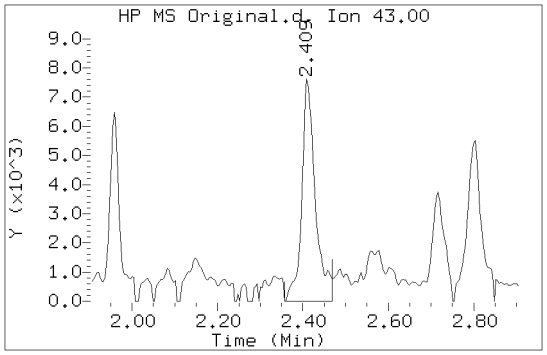

AFTER

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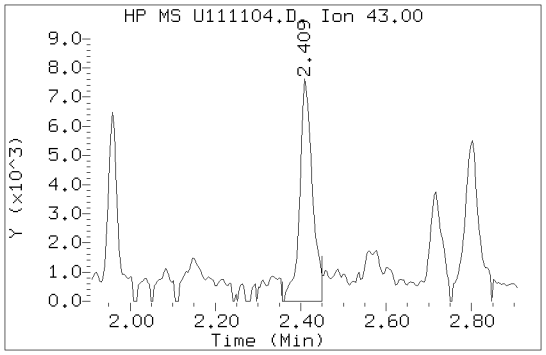

BEFORE

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16-Nov-2022
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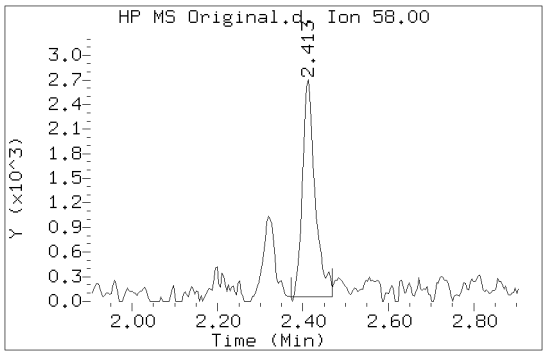

AFTER

MASS
58
AREA
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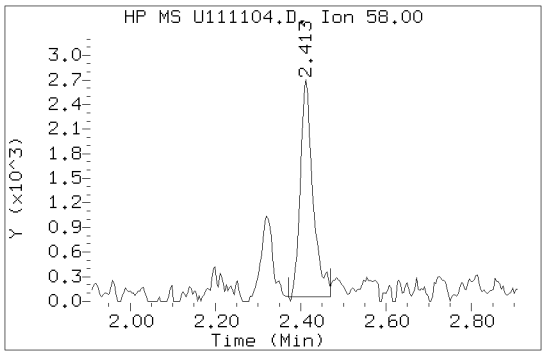
HEIGHT
2645
16-Nov-2022
09:41
linh
pham



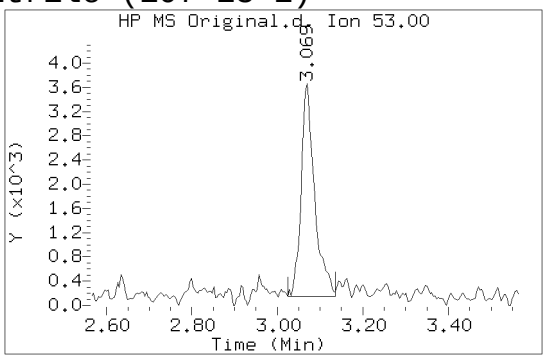
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D
Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

Acrylonitrile (107-13-1)

Reason Code:

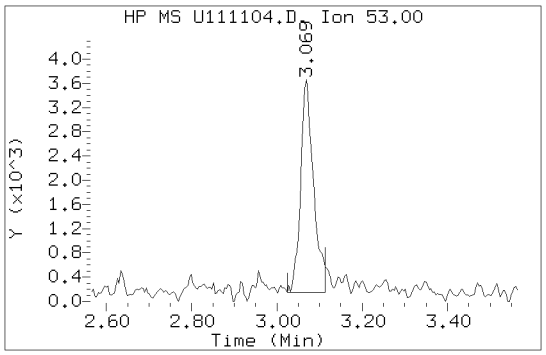
BEFORE

MASS
53
AREA
7814
HEIGHT
3508
16-Nov-2022
09:38
linh
pham



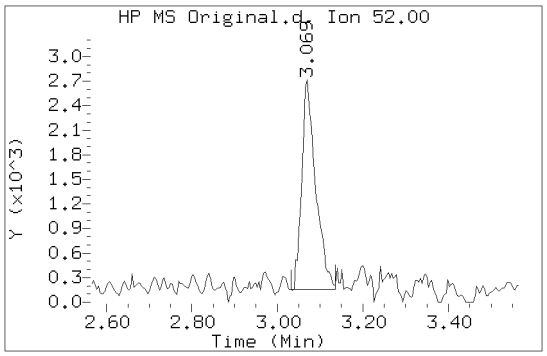
AFTER

MASS
53
AREA
7529
HEIGHT
3508
16-Nov-2022
09:41
linh
pham



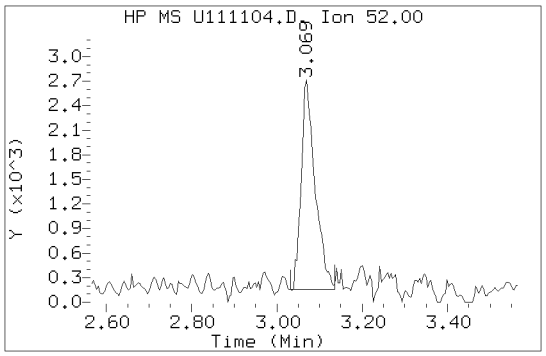
BEFORE

MASS
52
AREA
5876
HEIGHT
2556
16-Nov-2022
09:38
linh
pham



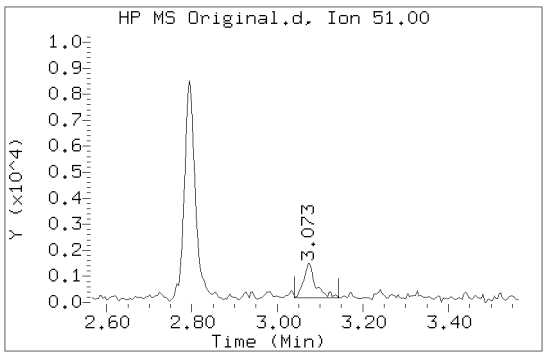
AFTER

MASS
52
AREA
5876
HEIGHT
2556
16-Nov-2022
09:41
linh
pham



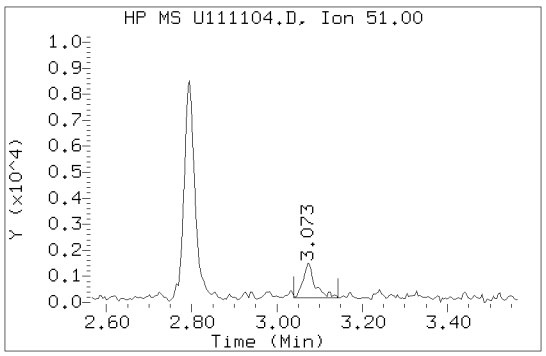
BEFORE

MASS
51
AREA
2627
HEIGHT
1319
16-Nov-2022
09:38
linh
pham



AFTER

MASS
51
AREA
2627
HEIGHT
1319
16-Nov-2022
09:41
linh
pham

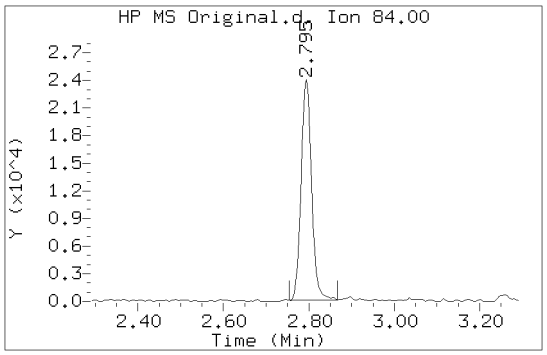


Methylene Chloride (75-09-2)

Reason Code:

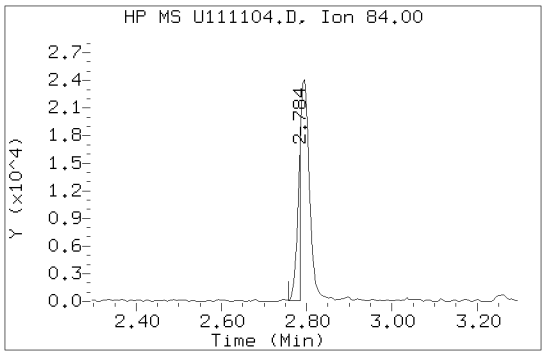
BEFORE

MASS
84
AREA
41845
HEIGHT
23933
16-Nov-2022
09:38
linh
pham



AFTER

MASS
84
AREA
9340
HEIGHT
16751
16-Nov-2022
09:41
linh
pham



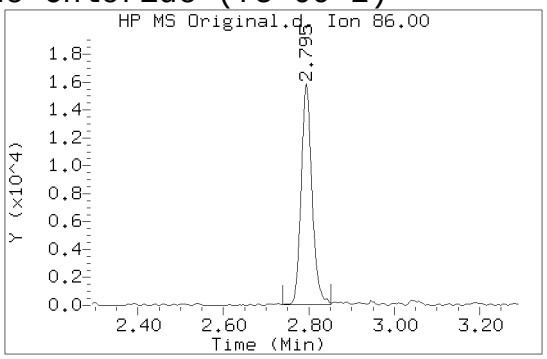
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D
Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

Methylene Chloride (75-09-2)

Reason Code:

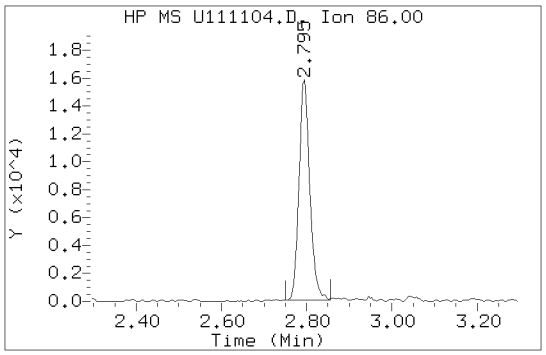
BEFORE

MASS
86
AREA
28445
HEIGHT
15820
16-Nov-2022
09:38
linh
pham



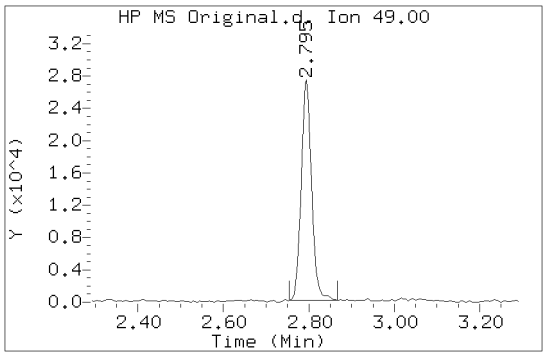
AFTER

MASS
86
AREA
28322
HEIGHT
15798
16-Nov-2022
09:41
linh
pham



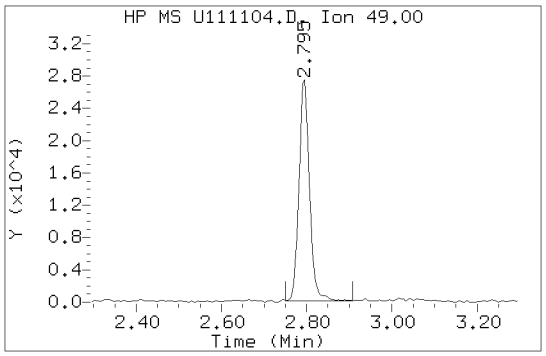
BEFORE

MASS
49
AREA
47327
HEIGHT
27302
16-Nov-2022
09:38
linh
pham



AFTER

MASS
49
AREA
48025
HEIGHT
27369
16-Nov-2022
09:41
linh
pham

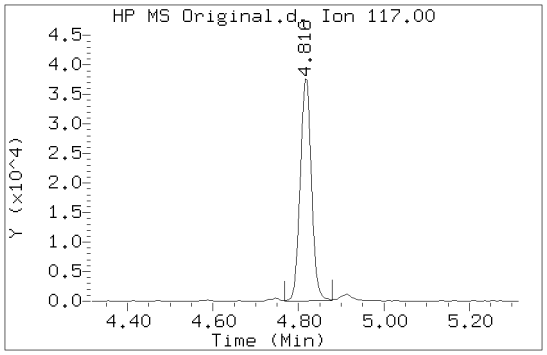


Carbon Tetrachloride (56-23-5)

Reason Code:

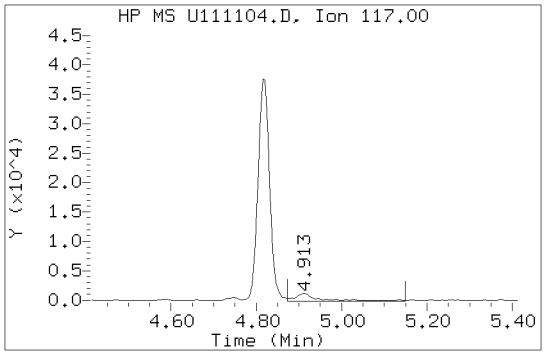
BEFORE

MASS
117
AREA
70415
HEIGHT
37568
16-Nov-2022
09:38
linh
pham



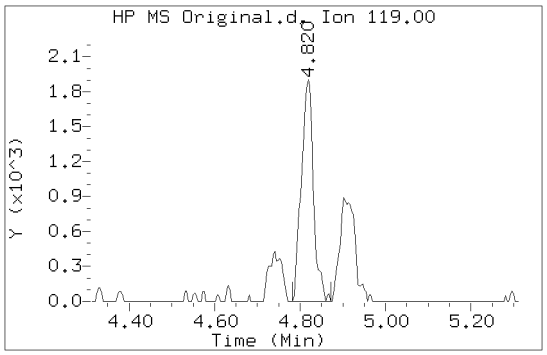
AFTER

MASS
117
AREA
5716
HEIGHT
1304
16-Nov-2022
09:41
linh
pham



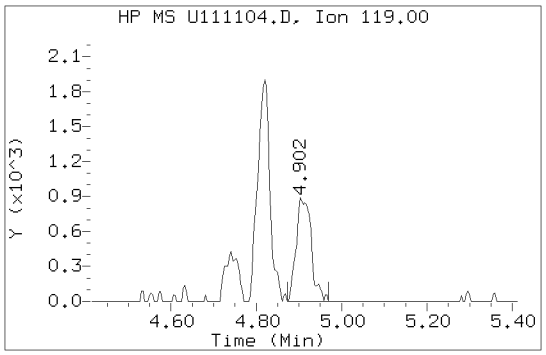
BEFORE

MASS
119
AREA
3832
HEIGHT
1903
16-Nov-2022
09:38
linh
pham



AFTER

MASS
119
AREA
2222
HEIGHT
890
16-Nov-2022
09:41
linh
pham



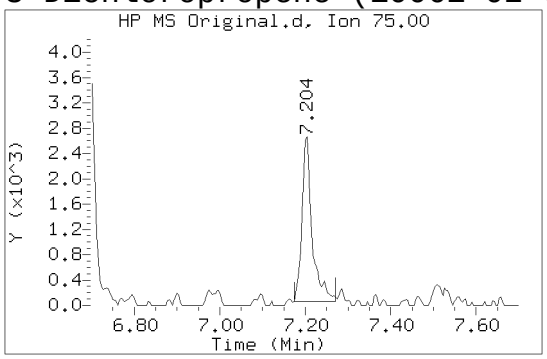
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D
Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

trans-1,3-Dichloropropene (10061-02-6)

Reason Code:

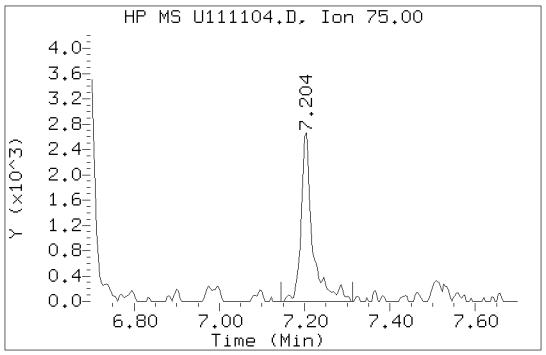
BEFORE

MASS
75
AREA
4405
HEIGHT
2603
16-Nov-2022
09:38
linh
pham



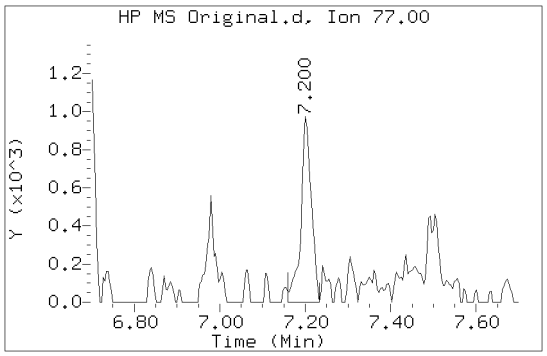
AFTER

MASS
75
AREA
5135
HEIGHT
2665
16-Nov-2022
09:41
linh
pham



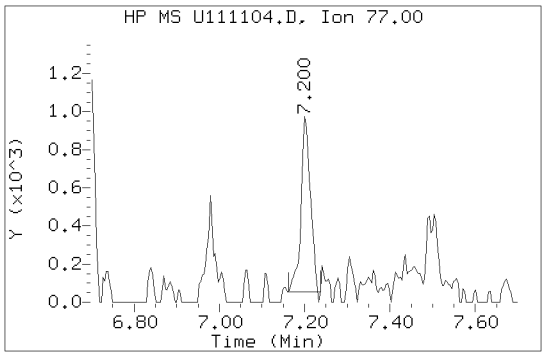
BEFORE

MASS
77
AREA
1689
HEIGHT
973
16-Nov-2022
09:38
linh
pham



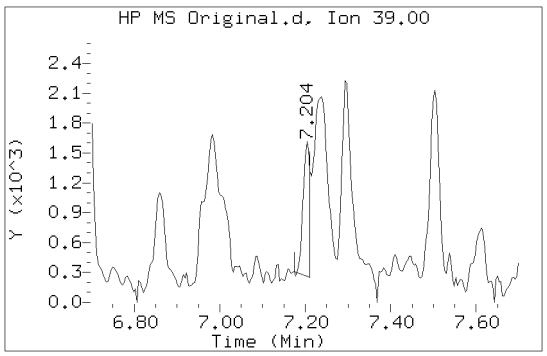
AFTER

MASS
77
AREA
1442
HEIGHT
920
16-Nov-2022
09:41
linh
pham



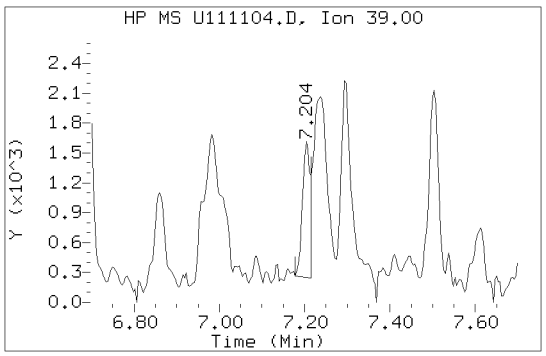
BEFORE

MASS
39
AREA
1512
HEIGHT
1356
16-Nov-2022
09:38
linh
pham



AFTER

MASS
39
AREA
1788
HEIGHT
1365
16-Nov-2022
09:41
linh
pham

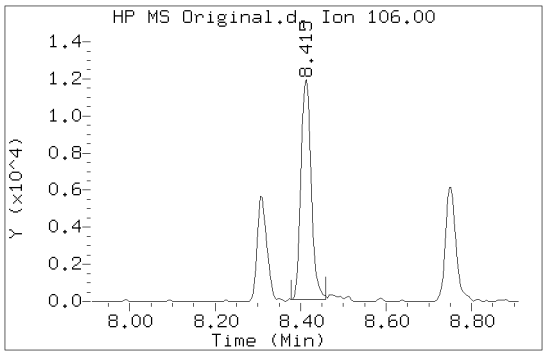


m,p-Xylenes ()

Reason Code:

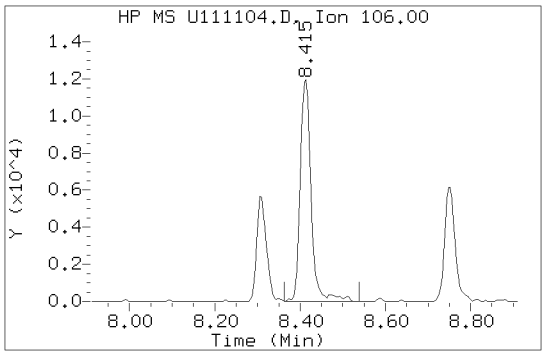
BEFORE

MASS
106
AREA
20386
HEIGHT
11854
16-Nov-2022
09:38
linh
pham



AFTER

MASS
106
AREA
21840
HEIGHT
11958
16-Nov-2022
09:41
linh
pham



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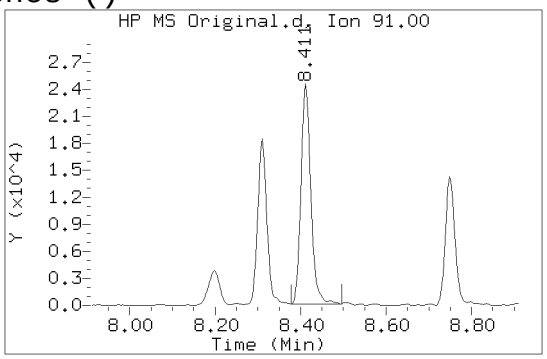
Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

m,p-Xylenes ()

Reason Code:

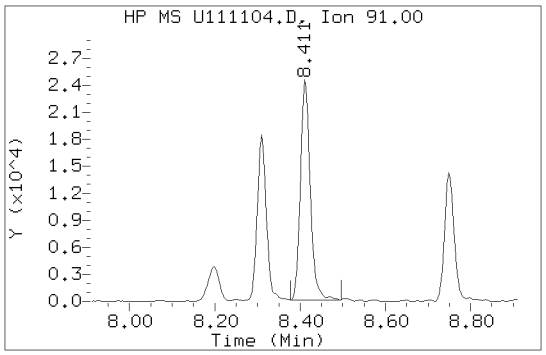
BEFORE

MASS
91
AREA
40195
HEIGHT
24471
16-Nov-2022
09:38
linh
pham



AFTER

MASS
91
AREA
40195
HEIGHT
24471
16-Nov-2022
09:41
linh
pham

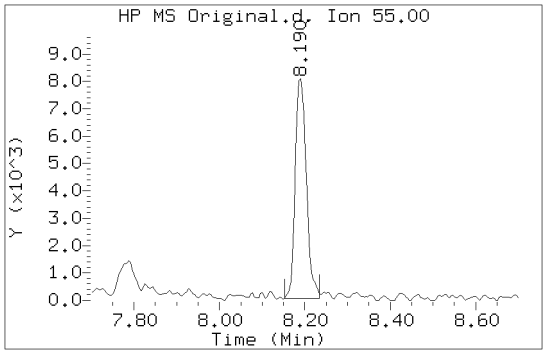


1-Chlorohexane (544-10-5)

Reason Code:

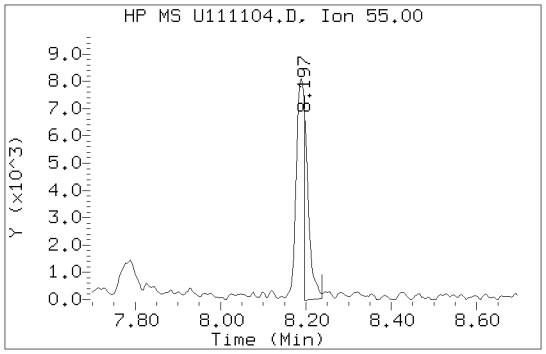
BEFORE

MASS
55
AREA
14750
HEIGHT
8037
16-Nov-2022
09:38
linh
pham



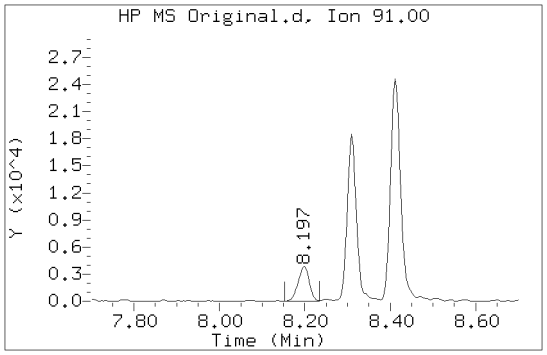
AFTER

MASS
55
AREA
5434
HEIGHT
6809
16-Nov-2022
09:41
linh
pham



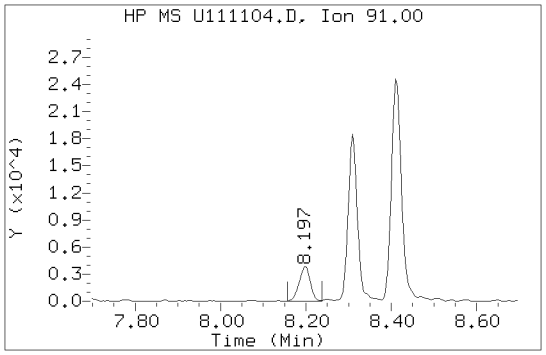
BEFORE

MASS
91
AREA
7066
HEIGHT
3860
16-Nov-2022
09:38
linh
pham



AFTER

MASS
91
AREA
7085
HEIGHT
3860
16-Nov-2022
09:41
linh
pham

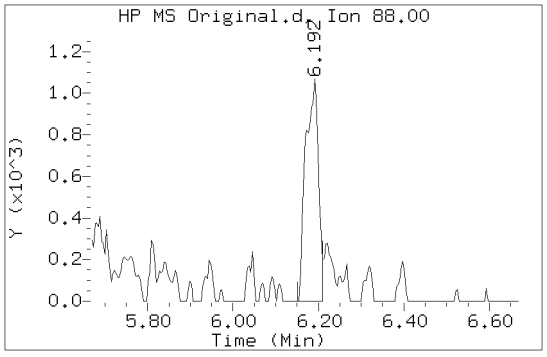


1,4-Dioxane ()

Reason Code:

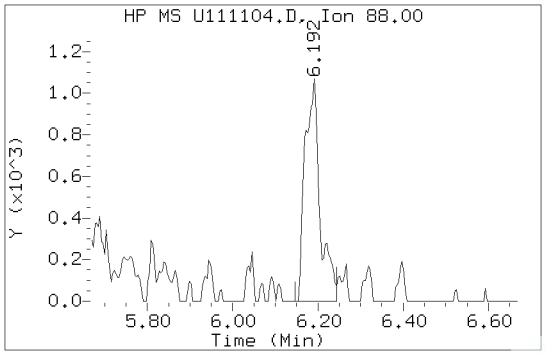
BEFORE

MASS
88
AREA
2259
HEIGHT
1069
16-Nov-2022
09:38
linh
pham



AFTER

MASS
88
AREA
2641
HEIGHT
1069
16-Nov-2022
09:41
linh
pham



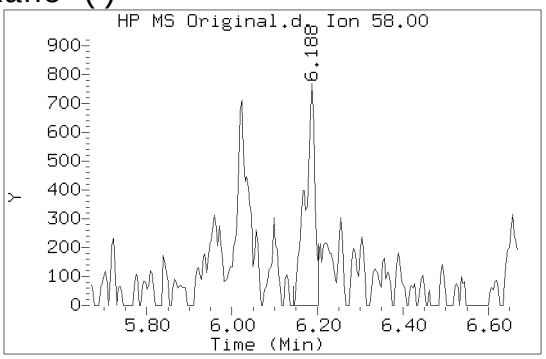
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111104.D
Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

1,4-Dioxane ()

Reason Code:

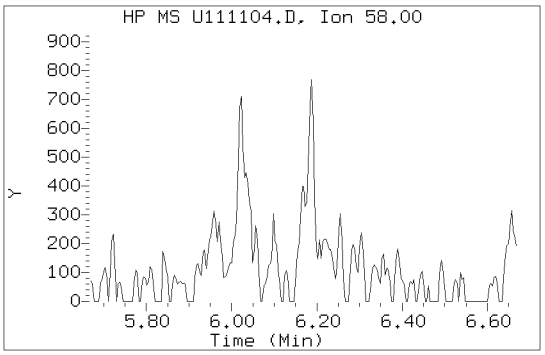
BEFORE

MASS
58
AREA
1225
HEIGHT
769
16-Nov-2022
09:38
linh
pham



AFTER

MASS
58
AREA
0
HEIGHT
0
16-Nov-2022
09:41
linh
pham

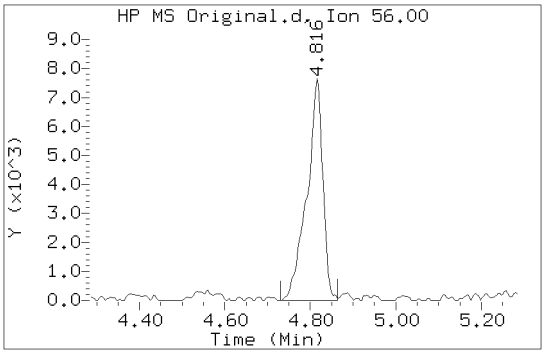


Cyclohexane (110-82-7)

Reason Code:

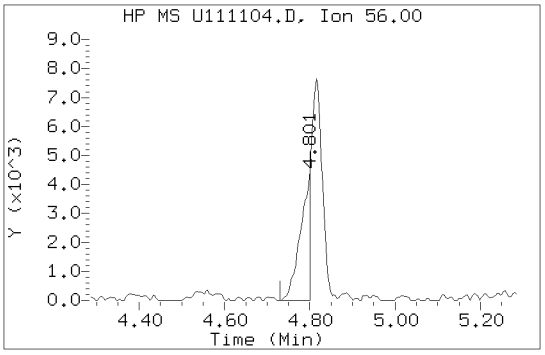
BEFORE

MASS
56
AREA
19950
HEIGHT
7650
16-Nov-2022
09:38
linh
pham



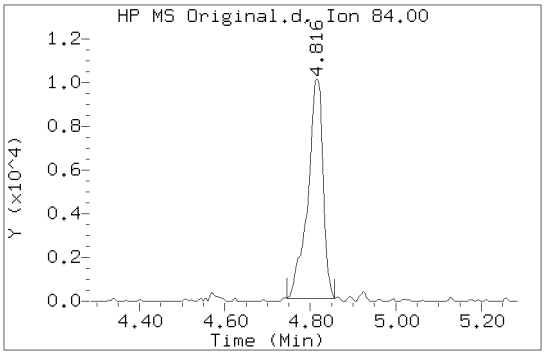
AFTER

MASS
56
AREA
7250
HEIGHT
4471
16-Nov-2022
09:41
linh
pham



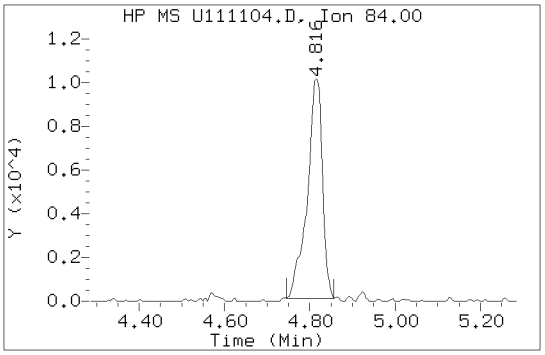
BEFORE

MASS
84
AREA
25113
HEIGHT
10069
16-Nov-2022
09:38
linh
pham



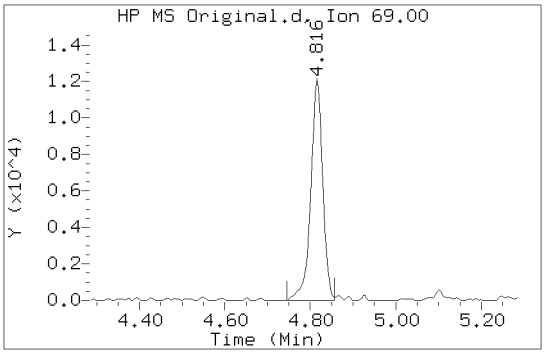
AFTER

MASS
84
AREA
25113
HEIGHT
10069
16-Nov-2022
09:41
linh
pham



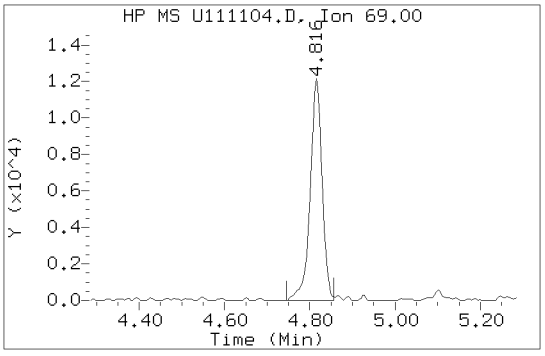
BEFORE

MASS
69
AREA
23610
HEIGHT
12152
16-Nov-2022
09:38
linh
pham



AFTER

MASS
69
AREA
23610
HEIGHT
12152
16-Nov-2022
09:41
linh
pham



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Inj Date : 11-NOV-2022 13:03
InstruID : VOA9.i
LabSampID : VSTD001

Methyl Acetate (79-20-9)

Reason Code:

BEFORE

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3745
16-Nov-2022
09:38
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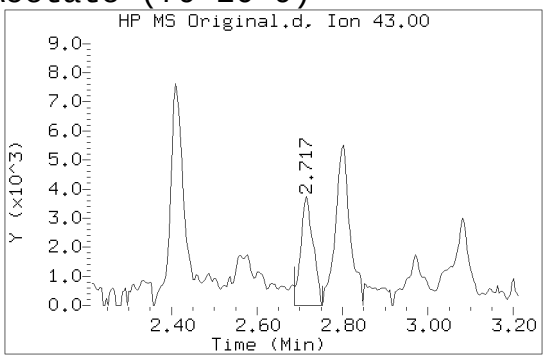
pham



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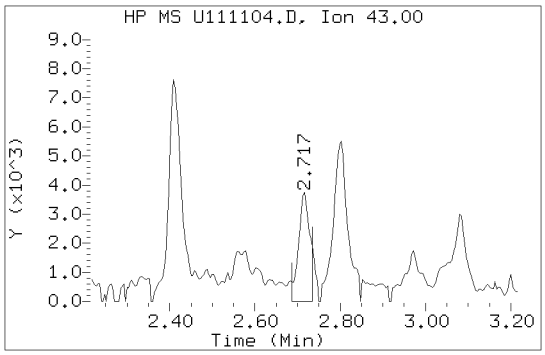

BEFORE

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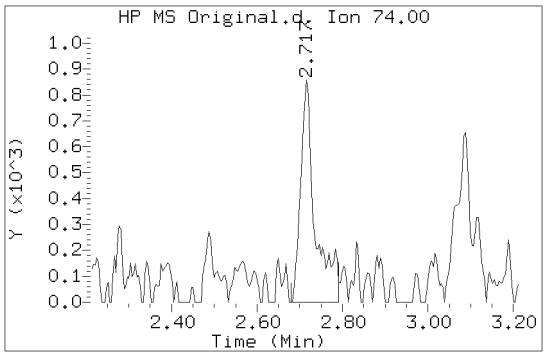
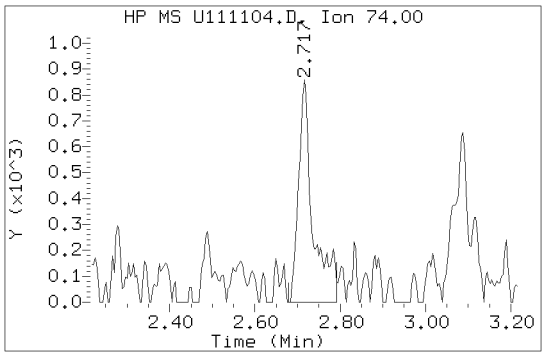
pham



AFTER

MASS
74
AREA
2046
HEIGHT
858
16-Nov-2022
09:41
linh
pham



Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D Page 1
Report Date: 16-Nov-2022 09:41

ALS Laboratory Group

Data file : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
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Inj Date : 11-NOV-2022 13:25
Operator : PC Inst ID: VOA9.i
Smp Info : VSTD002;VSTD002;1;4;
Misc Info : 180315V9;WATER;0;1;
Comment :
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Meth Date : 16-Nov-2022 09:41 VOA9.i Quant Type: ISTD
Cal Date : 11-NOV-2022 13:03 Cal File: U111104.D
Als bottle: 6 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 08260V9.sub
Target Version: 4.14
Processing Host: NAHSTW7056

Concentration Formula: Amt * DF * (Uf/Vo)*1 * CpndVariable

Name	Value	Description
DF	1.000	Dilution Factor
Uf	5.000	ng unit correction factor
Vo	5.000	sample purged
Cpnd Variable		Local Compound Variable

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
* 1 Pentafluorobenzene	168	4.822	4.822	(1.000)	746461	50.0000	
2 Dichlorodifluoromethane	85	1.171	1.171	(0.243)	13794	2.00000	2.74
3 Chloromethane	50	1.306	1.306	(0.271)	18483	2.00000	2.48
5 Vinyl Chloride	62	1.385	1.385	(0.287)	14663	2.00000	1.92
6 Bromomethane	94	1.632	1.632	(0.339)	14046	2.00000	1.62
7 Chloroethane	64	1.707	1.707	(0.354)	11136	2.00000	2.00(M)
8 Trichlorofluoromethane	101	1.906	1.906	(0.395)	21120	2.00000	2.13
9 Acrolein	56	2.281	2.281	(0.473)	2628	4.00000	5.86
10 Acetone	43	2.423	2.423	(0.503)	24043	4.00000	0.96
11 1,1-Dichloroethene	96	2.345	2.345	(0.486)	12214	2.00000	1.91
15 Iodomethane	142	2.476	2.476	(0.513)	22375	4.00000	6.99(M)
16 Acrylonitrile	53	3.076	3.076	(0.638)	13691	4.00000	3.94(M)
17 Methylene Chloride	84	2.798	2.798	(0.580)	17193	2.00000	0.61(M)
18 Methyl tert-butyl ether	73	3.094	3.094	(0.642)	43958	2.00000	2.04
19 Carbon Disulfide	76	2.532	2.532	(0.525)	73877	4.00000	3.98
20 trans-1,2-Dichloroethene	96	3.072	3.072	(0.637)	14067	2.00000	1.99
21 Vinyl Acetate	43	3.619	3.619	(0.750)	74174	4.00000	4.03
22 1,1-Dichloroethane	63	3.525	3.525	(0.731)	25281	2.00000	2.01
24 2-Butanone	43	4.279	4.279	(0.887)	11699	4.00000	3.87
26 2,2-Dichloropropane	77	4.189	4.189	(0.869)	11193	2.00000	2.95

27 cis-1,2-Dichloroethene	96	4.208	4.208 (0.873)	16422	2.00000	1.98
28 Chloroform	83	4.583	4.583 (0.950)	26169	2.00000	1.95

Data File: \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D Page 2
Report Date: 16-Nov-2022 09:41

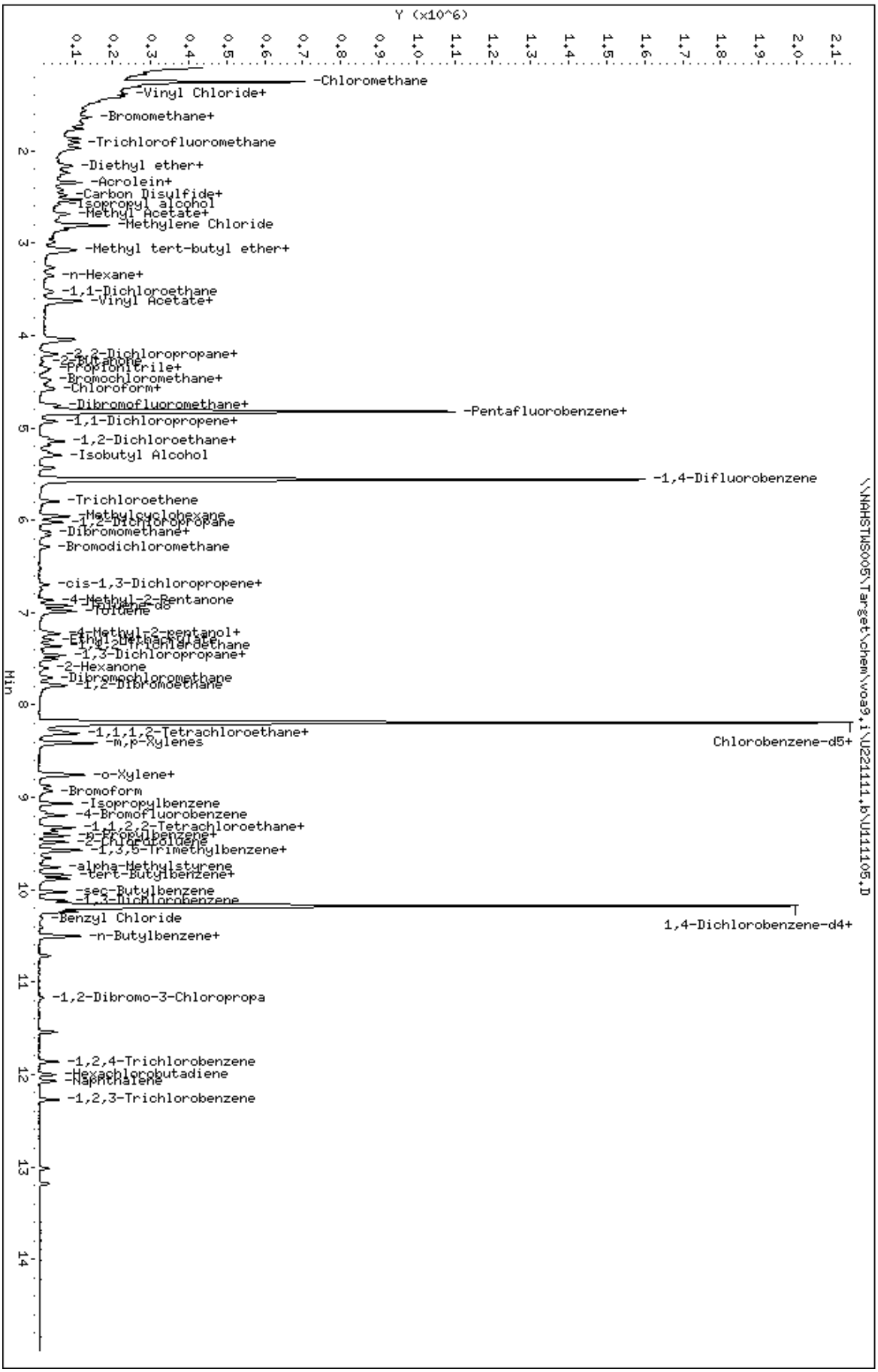
	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/l)	ON-COL (ug/l)
	29 Bromochloromethane	128	4.478	4.478	(0.928)	9278	2.00000	2.09
$	30 Dibromofluoromethane	113	4.759	4.759	(0.987)	15872	2.00000	1.79
	31 1,1,1-Trichloroethane	97	4.751	4.751	(0.985)	17223	2.00000	1.91
	32 1,1-Dichloropropene	75	4.927	4.927	(0.887)	16910	2.00000	1.96
	33 1,2-Dichloroethane	62	5.186	5.186	(0.933)	22368	2.00000	2.04
	34 Carbon Tetrachloride	117	4.920	4.920	(0.885)	12588	2.00000	2.57(MH)
$	35 1,2-Dichloroethane-d4	65	5.107	5.107	(1.059)	19160	2.00000	1.65
*	36 1,4-Difluorobenzene	114	5.557	5.557	(1.000)	1244542	50.0000	
	37 Benzene	78	5.145	5.145	(0.926)	58203	2.00000	1.98
	38 Trichloroethene	130	5.793	5.793	(1.042)	15914	2.00000	1.98
	39 Bromodichloromethane	83	6.284	6.284	(1.131)	16187	2.00000	1.80(M)
	42 1,2-Dichloropropane	63	6.015	6.015	(1.082)	13884	2.00000	1.86
	44 Dibromomethane	93	6.131	6.131	(1.103)	10342	2.00000	1.92
	45 4-Methyl-2-Pentanone	43	6.862	6.862	(0.838)	24145	4.00000	3.67(M)
	46 cis-1,3-Dichloropropene	75	6.697	6.697	(1.205)	12126	2.00000	3.75
*	47 Chlorobenzene-d5	117	8.189	8.189	(1.000)	1119395	50.0000	
$	48 Toluene-d8	98	6.925	6.925	(0.846)	52636	2.00000	1.97
	50 Toluene	91	6.985	6.985	(0.853)	56567	2.00000	1.90
	51 trans-1,3-Dichloropropene	75	7.203	7.203	(1.296)	10490	2.00000	4.38(M)
	52 2-Hexanone	43	7.600	7.600	(0.928)	15502	4.00000	4.47(M)
	53 1,1,2-Trichloroethane	83	7.360	7.360	(0.899)	13920	2.00000	2.17
	54 1,3-Dichloropropane	76	7.503	7.503	(0.916)	26079	2.00000	1.99
	55 Dibromochloromethane	129	7.698	7.698	(0.940)	10463	2.00000	2.66
	56 Tetrachloroethene	164	7.462	7.462	(0.911)	13332	2.00000	2.06
	57 1,2-Dibromoethane	107	7.788	7.788	(0.951)	15362	2.00000	1.95
	58 1-Chlorohexane	55	8.196	8.196	(1.475)	10304	2.00000	3.24(M)
	59 Chlorobenzene	112	8.215	8.215	(1.003)	43244	2.00000	2.03
	60 1,1,1,2-Tetrachloroethane	131	8.290	8.290	(1.012)	13795	2.00000	1.98
	61 Ethylbenzene	106	8.309	8.309	(1.015)	19427	2.00000	1.98
	62 m,p-Xylenes	106	8.414	8.414	(1.027)	47631	4.00000	3.90(M)
	63 o-Xylene	106	8.751	8.751	(1.069)	23225	2.00000	1.92
	64 Styrene	104	8.766	8.766	(1.070)	30964	2.00000	2.64(M)
	66 Bromoform	173	8.920	8.920	(1.089)	7647	2.00000	3.58
	67 Isopropylbenzene	105	9.066	9.066	(1.107)	52133	2.00000	1.87
	68 1,1,2,2-Tetrachloroethane	83	9.332	9.332	(0.917)	22321	2.00000	2.11
$	69 4-Bromofluorobenzene	95	9.197	9.197	(1.123)	19298	2.00000	2.13
*	70 1,4-Dichlorobenzene-d4	152	10.172	10.172	(1.000)	531928	50.0000	
	71 1,2,3-Trichloropropane	75	9.366	9.366	(0.921)	16963	2.00000	1.85
	73 n-Propylbenzene	91	9.415	9.415	(0.926)	57771	2.00000	2.01
	74 Bromobenzene	156	9.321	9.321	(0.916)	17659	2.00000	2.09
	75 1,3,5-Trimethylbenzene	105	9.565	9.565	(0.940)	39935	2.00000	1.88
	76 2-Chlorotoluene	91	9.486	9.486	(0.933)	39706	2.00000	1.97
	77 4-Chlorotoluene	91	9.580	9.580	(0.942)	43164	2.00000	1.91
	78 tert-Butylbenzene	119	9.838	9.838	(0.967)	37419	2.00000	2.01
	79 1,2,4-Trimethylbenzene	105	9.883	9.883	(0.972)	48480	2.00000	2.17
	81 sec-Butylbenzene	105	10.026	10.026	(0.986)	48003	2.00000	3.55
	82 p-Isopropyltoluene	119	10.149	10.149	(0.998)	41100	2.00000	2.01
	83 1,3-Dichlorobenzene	146	10.119	10.119	(0.995)	28966	2.00000	2.00
	84 1,4-Dichlorobenzene	146	10.194	10.194	(1.002)	33214	2.00000	2.08
	87 n-Butylbenzene	91	10.498	10.498	(1.032)	30228	2.00000	3.82
	88 1,2-Dichlorobenzene	146	10.509	10.509	(1.033)	29702	2.00000	1.94
	89 1,2-Dibromo-3-Chloropropane	155	11.169	11.169	(1.098)	2331	2.00000	3.70

90 1,2,4-Trichlorobenzene	180	11.862	11.862 (1.166)	14989	2.00000	1.79
91 Hexachlorobutadiene	225	12.001	12.001 (1.180)	7172	2.00000	3.44

		QUANT SIG					AMOUNTS CAL-AMT	ON-COL
	Compounds	MASS	RT	EXP RT	REL RT	RESPONSE	(ug/l)	(ug/l)
	92 Naphthalene	128	12.072	12.072	(1.187)	35133	2.00000	1.68
	93 1,2,3-Trichlorobenzene	180	12.271	12.271	(1.206)	15447	2.00000	1.86
M	94 1,2-Dichloroethylene (total)	96				30489	4.00000	
M	95 Xylenes (total)	106				70856	6.00000	
	135 1,4-Dioxane	88	6.179	6.179	(1.281)	4861	40.0000	42.87
	141 Cyclohexane	56	4.789	4.789	(0.993)	14256	2.00000	2.24(MH)
	138 Freon TF	101	2.345	2.345	(0.486)	11940	2.00000	2.53
	140 1,3-Butadiene	54	1.411	1.411	(0.293)	9824	2.00000	3.34
	147 Methylcyclohexane	55	5.955	5.955	(1.071)	34738	2.00000	1.97
	146 Methyl Acetate	43	2.727	2.727	(0.566)	12314	2.00000	2.01
	148 Tert-Butyl alcohol	59	2.986	2.986	(0.619)	28249	40.0000	39.12(a)
	149 Isopropyl Alcohol	45	2.577	2.577	(0.534)	17365	40.0000	36.49

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.


Y (x10^6)
Min
-Chloromethane
-Vinyl Chloride+
-Bromomethane+
-Trichlorofluoromethane
-Diethyl ether+
-Acrolein+
-Carbon Disulfide+
-Isopropyl alcohol
-Methyl Acetate+
-Methylene Chloride
-Methyl tert-butyl ether+
-n-Hexane+
-1,1-Dichloroethane
-Vinyl Acetate+
-2,2-Dichloropropane+
-2-Butanone
-Propionitrile+
-Bromochloromethane+
-Chloroform+
-Dibromofluoromethane+
-Pentafluorobenzene+
-1,1-Dichloropropene+
-1,2-Dichloroethane+
-Isobutyl Alcohol
-1,4-Difluorobenzene
-Trichloroethene
-Methylcyclohexane
-1,2-Dichloropropane
-Dibromomethane+
-Bromodichloromethane
-cis-1,3-Dichloropropene+
-4-Methyl-2-Pentanone
-Toluene-d8
-4-Methyl-2-pentanol+
-Ethyl Methacrylate
-1,1,2-Trichloroethane
-1,3-Dichloropropane+
-2-Hexanone
-Dibromochloromethane
-1,2-Dibromoethane
-1,1,1,2-Tetrachloroethane+
-m,p-Xylenes
Chlorobenzene-d5+
-o-Xylene+
-Bromoform
-Isopropylbenzene
-4-Bromofluorobenzene
-1,1,2,2-Tetrachloroethane+
-n-Propylbenzene+
-2-Chlorotoluene
-1,3,5-Trimethylbenzene+
-alpha-Methylstyrene
-tert-Butylbenzene+
-sec-Butylbenzene
-1,3-Dichlorobenzene
-Benzyl Chloride
1,4-Dichlorobenzene-d4+
-n-Butylbenzene+
-1,2-Dibromo-3-Chloropropa
-1,2,4-Trichlorobenzene
-Hexachlorobutadiene
-Naphthalene
-1,2,3-Trichlorobenzene
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Client ID: VSTD002
Sample Info: VSTD002;VSTD002;1;4;
Purge Volume: 5.0
Column phase: DB624
Instrument: VOA9,i
Operator: PC
Column diameter: 0.18
Page 1

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Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

Chloroethane (75-00-3)

Reason Code:

BEFORE

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HEIGHT
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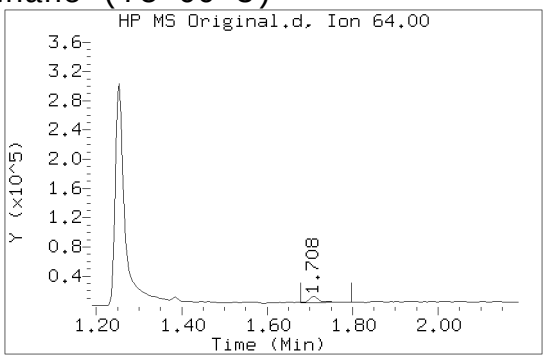
16-Nov-2022
09:38
linh
pham



AFTER

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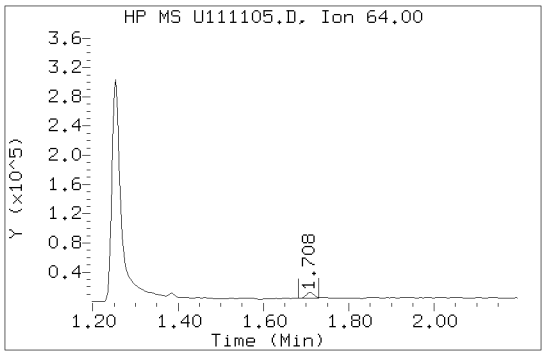

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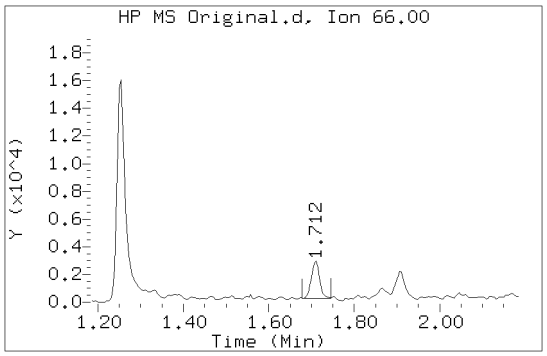

AFTER

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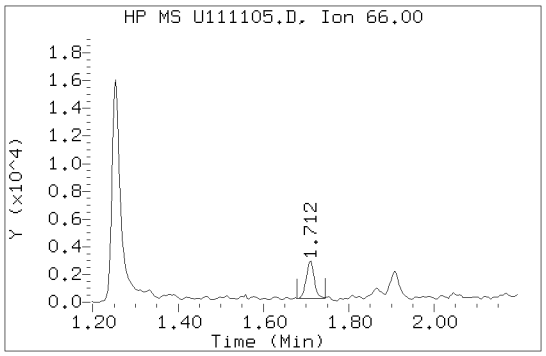

Iodomethane (74-88-4)

Reason Code:

BEFORE

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AREA
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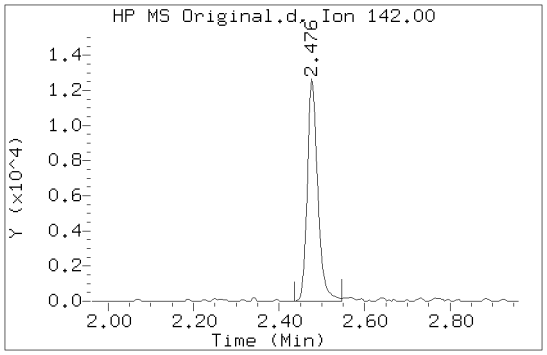
16-Nov-2022
09:38
linh
pham



AFTER

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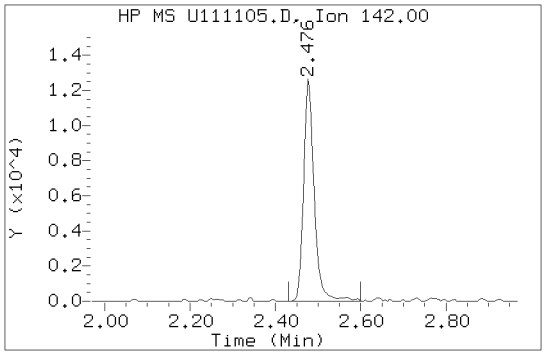

BEFORE

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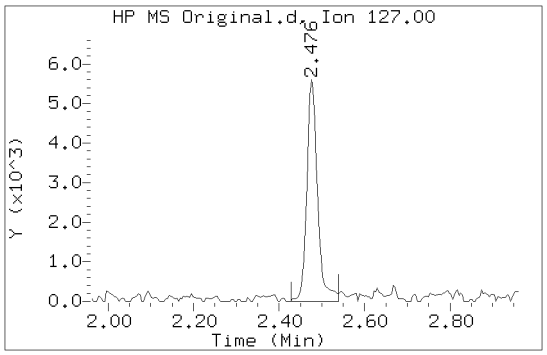

AFTER

MASS
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HEIGHT
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16-Nov-2022
09:41
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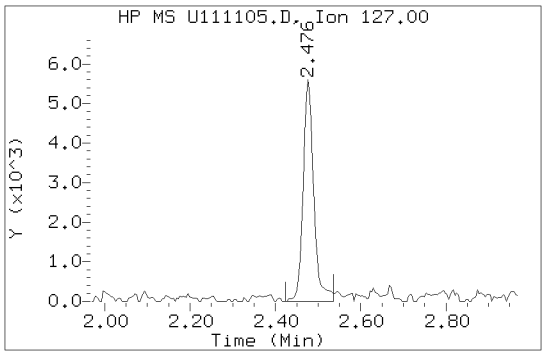

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Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

Iodomethane (74-88-4)

Reason Code:

BEFORE

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HEIGHT
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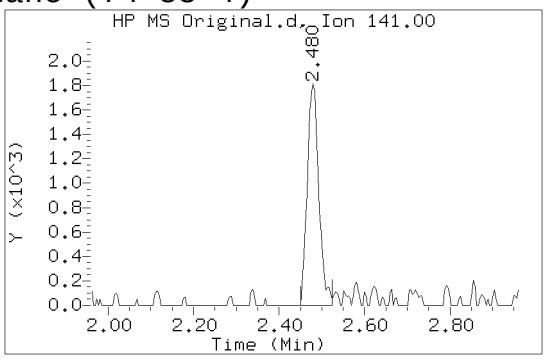
16-Nov-2022
09:38
linh
pham



AFTER

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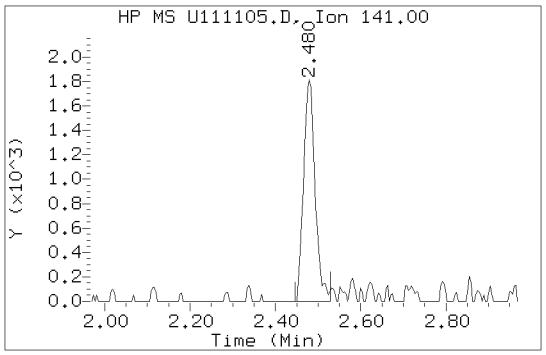

Acrylonitrile (107-13-1)

Reason Code:

BEFORE

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AREA
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16-Nov-2022
09:38
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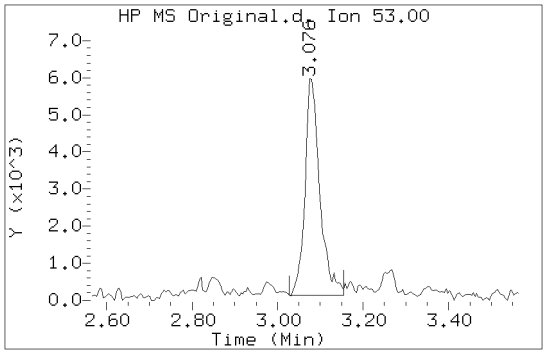
pham



AFTER

MASS
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HEIGHT
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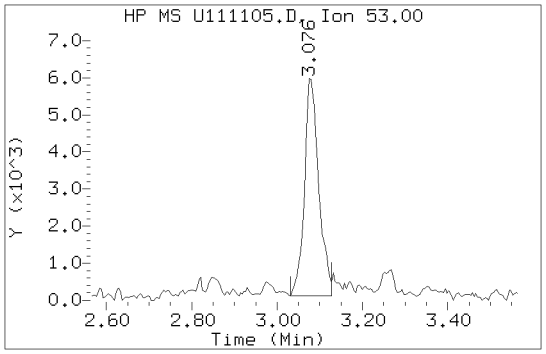
16-Nov-2022
09:41
linh
pham



BEFORE

MASS
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AREA
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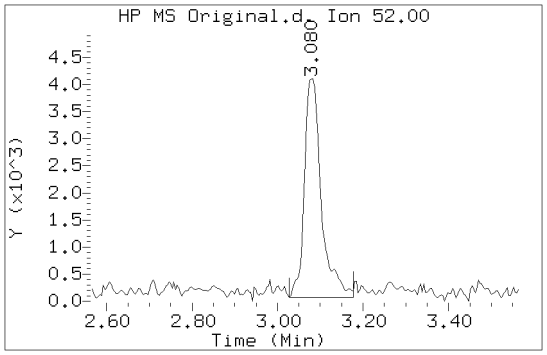
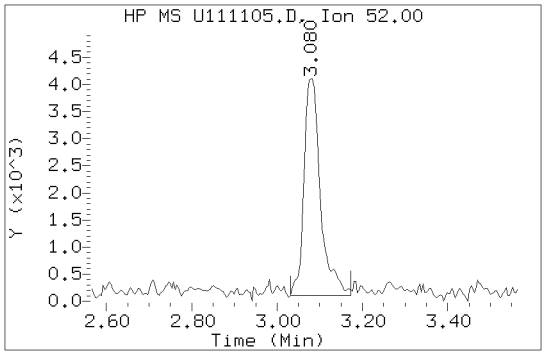
HEIGHT
4035
16-Nov-2022
09:38
linh
pham



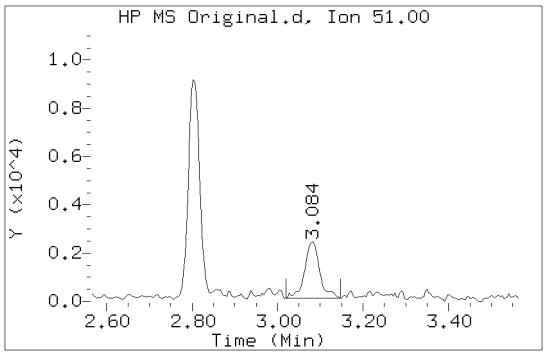
AFTER

MASS
52
AREA
10874
HEIGHT
4001
16-Nov-2022
09:41
linh
pham



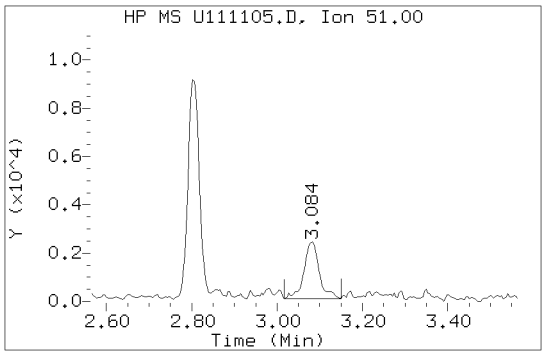
BEFORE

MASS
51
AREA
5730
HEIGHT
2328
16-Nov-2022
09:38
linh
pham



AFTER

MASS
51
AREA
5862
HEIGHT
2344
16-Nov-2022
09:41
linh
pham



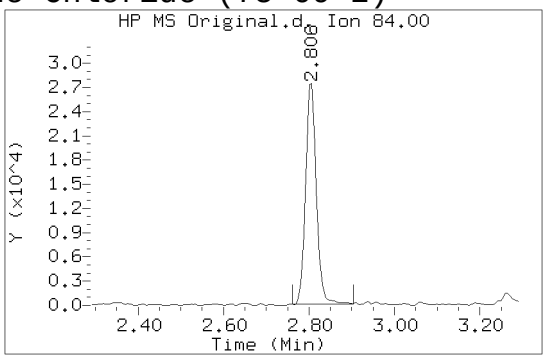
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

Methylene Chloride (75-09-2)

Reason Code:

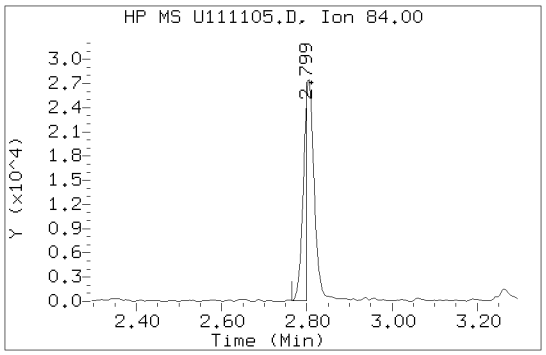
BEFORE

MASS
84
AREA
48450
HEIGHT
27283
16-Nov-2022
09:38
linh
pham



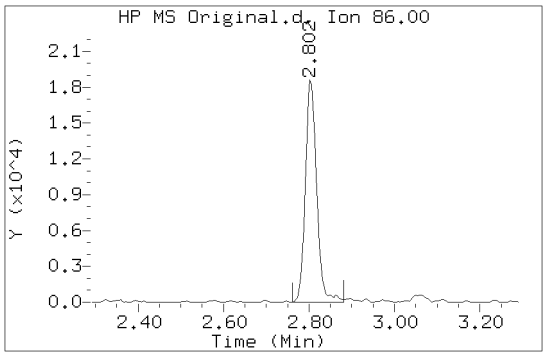
AFTER

MASS
84
AREA
17193
HEIGHT
24664
16-Nov-2022
09:41
linh
pham



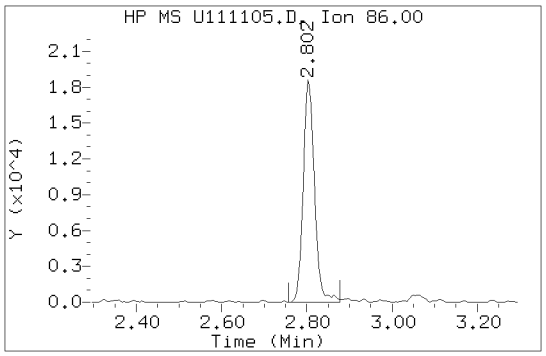
BEFORE

MASS
86
AREA
35033
HEIGHT
18616
16-Nov-2022
09:38
linh
pham



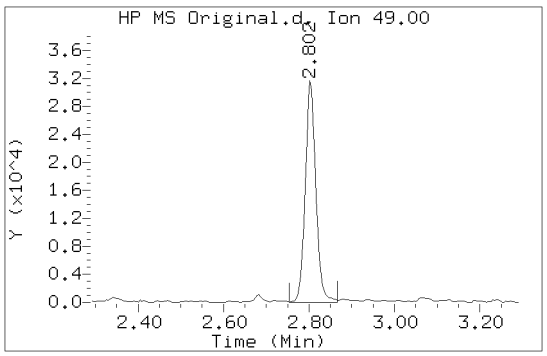
AFTER

MASS
86
AREA
34974
HEIGHT
18616
16-Nov-2022
09:41
linh
pham



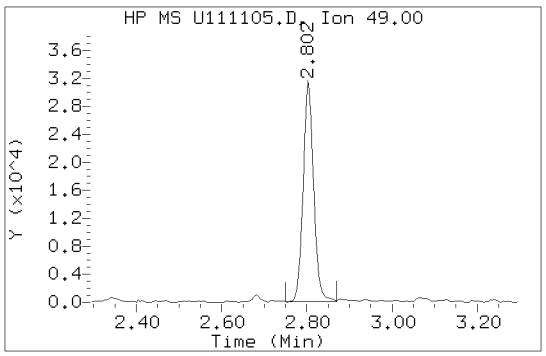
BEFORE

MASS
49
AREA
55631
HEIGHT
31672
16-Nov-2022
09:38
linh
pham



AFTER

MASS
49
AREA
55079
HEIGHT
31586
16-Nov-2022
09:41
linh
pham

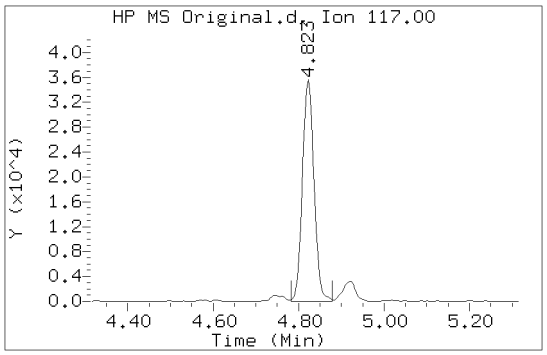


Carbon Tetrachloride (56-23-5)

Reason Code:

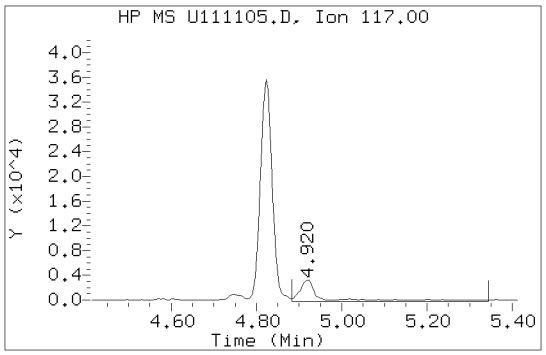
BEFORE

MASS
117
AREA
68020
HEIGHT
35624
16-Nov-2022
09:38
linh
pham



AFTER

MASS
117
AREA
12588
HEIGHT
3436
16-Nov-2022
09:41
linh
pham



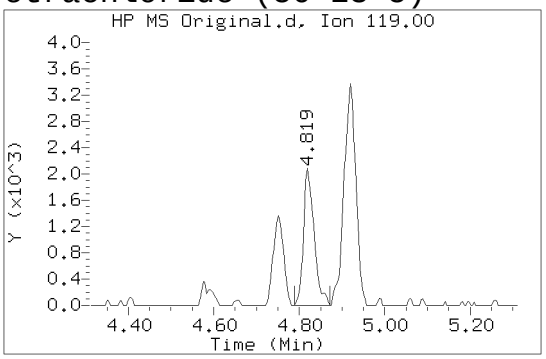
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

Carbon Tetrachloride (56-23-5)

Reason Code:

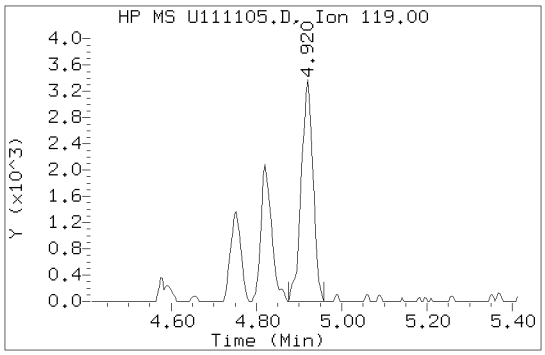
BEFORE

MASS
119
AREA
3654
HEIGHT
2086
16-Nov-2022
09:38
linh
pham



AFTER

MASS
119
AREA
6546
HEIGHT
3378
16-Nov-2022
09:41
linh
pham

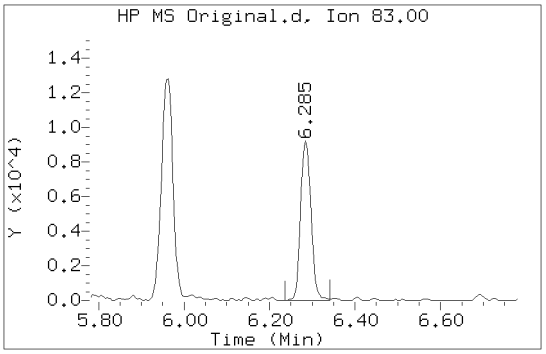


Bromodichloromethane (75-27-4)

Reason Code:

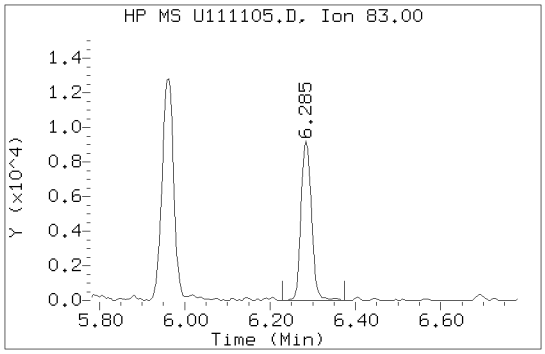
BEFORE

MASS
83
AREA
16064
HEIGHT
9221
16-Nov-2022
09:38
linh
pham



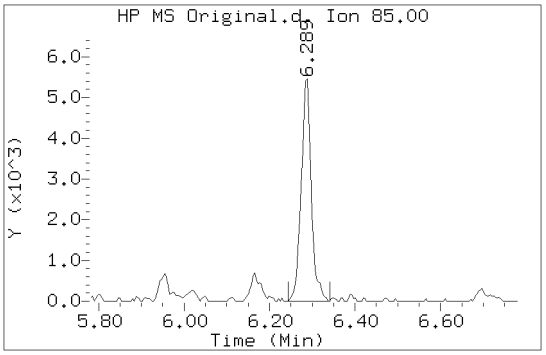
AFTER

MASS
83
AREA
16187
HEIGHT
9221
16-Nov-2022
09:41
linh
pham



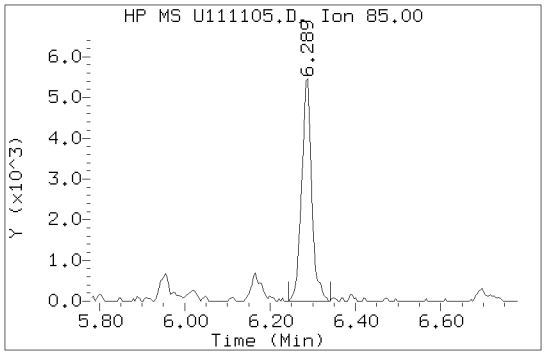
BEFORE

MASS
85
AREA
9177
HEIGHT
5457
16-Nov-2022
09:38
linh
pham



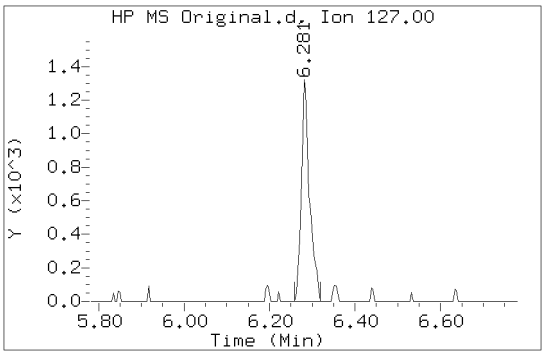
AFTER

MASS
85
AREA
9177
HEIGHT
5457
16-Nov-2022
09:41
linh
pham



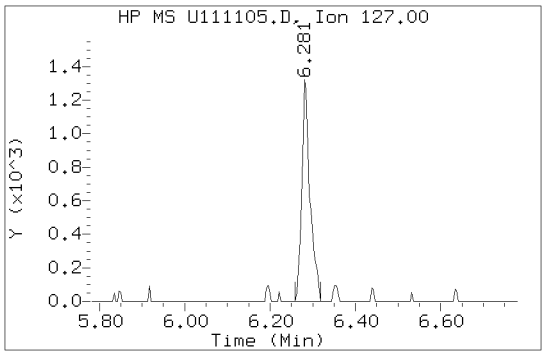
BEFORE

MASS
127
AREA
1824
HEIGHT
1322
16-Nov-2022
09:38
linh
pham



AFTER

MASS
127
AREA
1824
HEIGHT
1322
16-Nov-2022
09:41
linh
pham



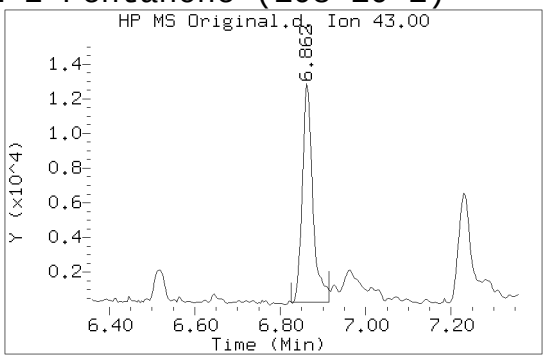
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

4-Methyl-2-Pentanone (108-10-1)

Reason Code:

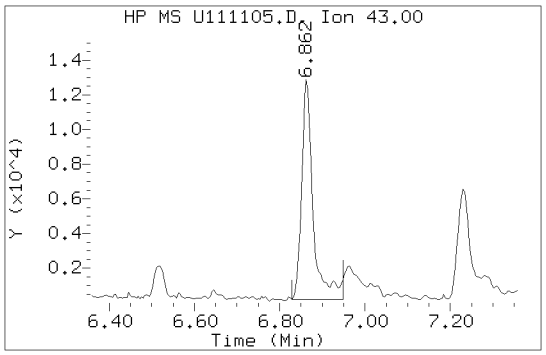
BEFORE

MASS
43
AREA
22006
HEIGHT
12596
16-Nov-2022
09:38
linh
pham



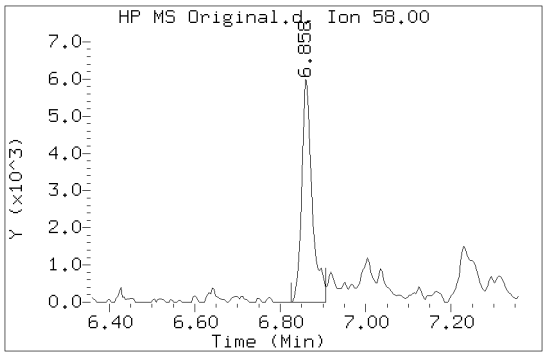
AFTER

MASS
43
AREA
24145
HEIGHT
12668
16-Nov-2022
09:41
linh
pham



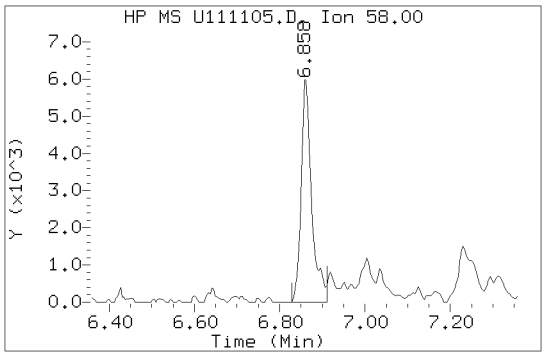
BEFORE

MASS
58
AREA
10421
HEIGHT
5976
16-Nov-2022
09:38
linh
pham



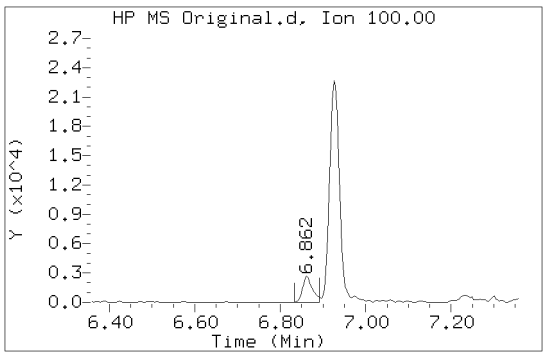
AFTER

MASS
58
AREA
10523
HEIGHT
5976
16-Nov-2022
09:41
linh
pham



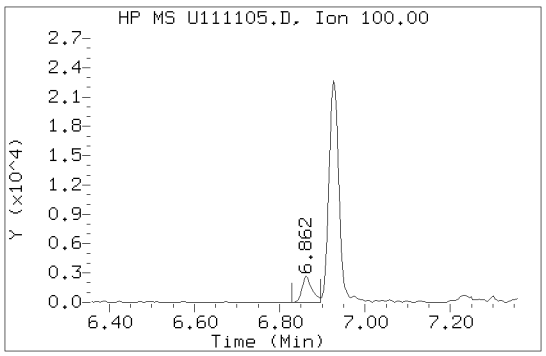
BEFORE

MASS
100
AREA
4434
HEIGHT
2672
16-Nov-2022
09:38
linh
pham



AFTER

MASS
100
AREA
4529
HEIGHT
2672
16-Nov-2022
09:41
linh
pham

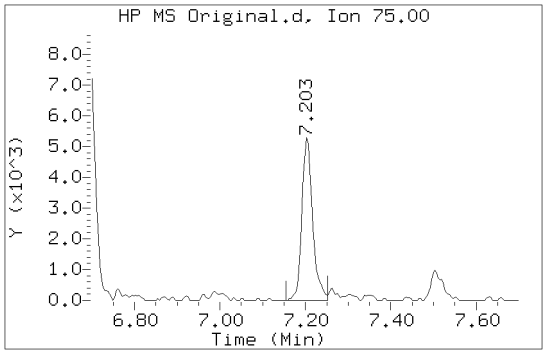


trans-1,3-Dichloropropene (10061-02-6)

Reason Code:

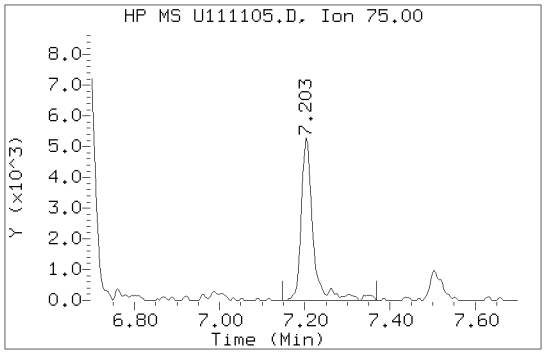
BEFORE

MASS
75
AREA
9434
HEIGHT
5297
16-Nov-2022
09:38
linh
pham



AFTER

MASS
75
AREA
10490
HEIGHT
5297
16-Nov-2022
09:41
linh
pham



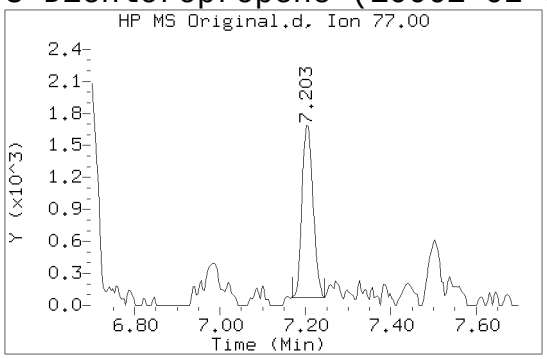
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

trans-1,3-Dichloropropene (10061-02-6)

Reason Code:

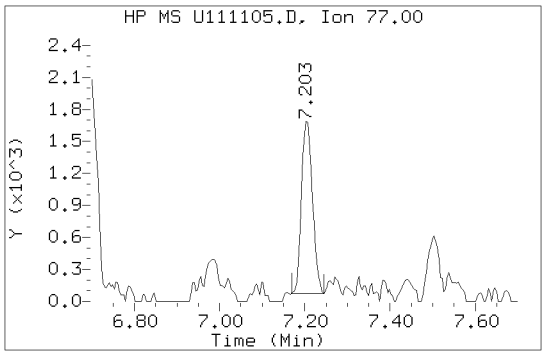
BEFORE

MASS
77
AREA
2936
HEIGHT
1617
16-Nov-2022
09:38
linh
pham



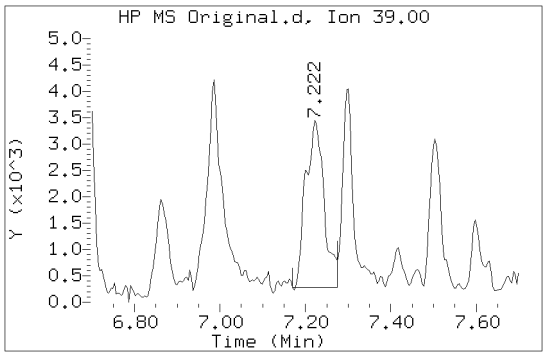
AFTER

MASS
77
AREA
2936
HEIGHT
1617
16-Nov-2022
09:41
linh
pham



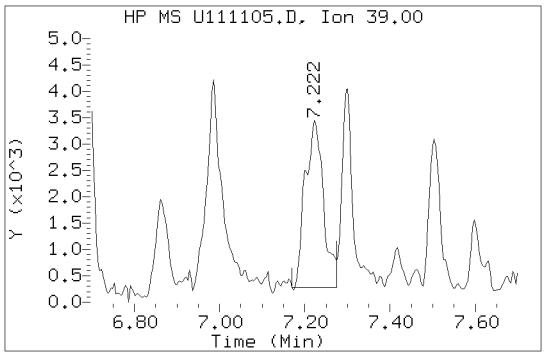
BEFORE

MASS
39
AREA
9473
HEIGHT
3166
16-Nov-2022
09:38
linh
pham



AFTER

MASS
39
AREA
9473
HEIGHT
3166
16-Nov-2022
09:41
linh
pham

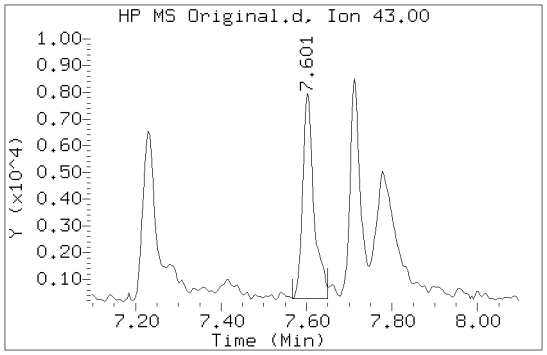


2-Hexanone (591-78-6)

Reason Code:

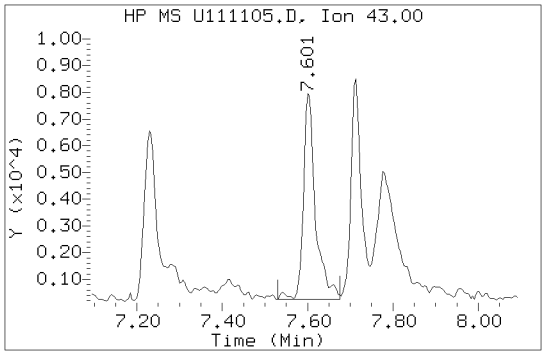
BEFORE

MASS
43
AREA
14384
HEIGHT
7666
16-Nov-2022
09:38
linh
pham



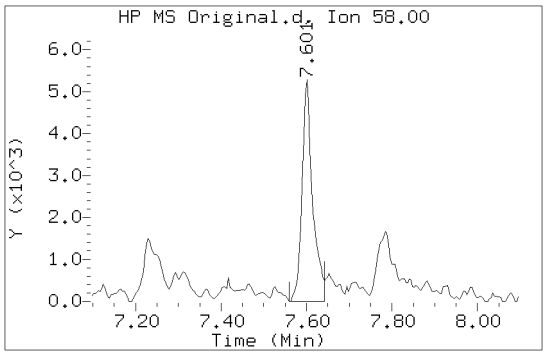
AFTER

MASS
43
AREA
15502
HEIGHT
7702
16-Nov-2022
09:41
linh
pham



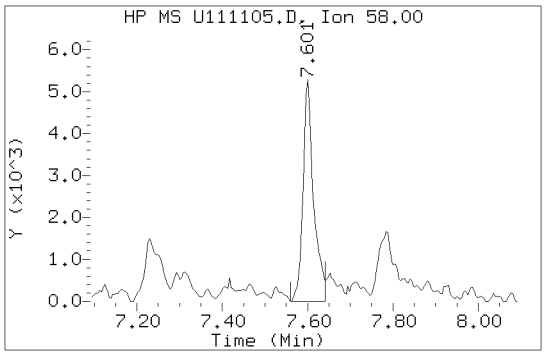
BEFORE

MASS
58
AREA
9305
HEIGHT
5285
16-Nov-2022
09:38
linh
pham



AFTER

MASS
58
AREA
9305
HEIGHT
5285
16-Nov-2022
09:41
linh
pham



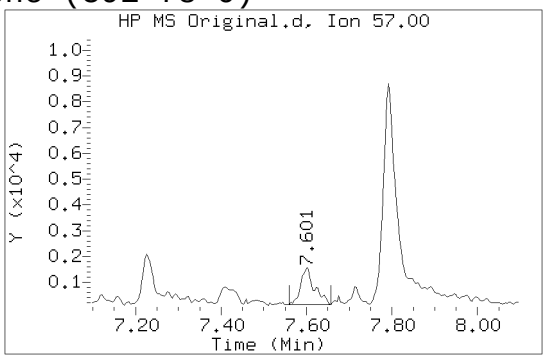
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

2-Hexanone (591-78-6)

Reason Code:

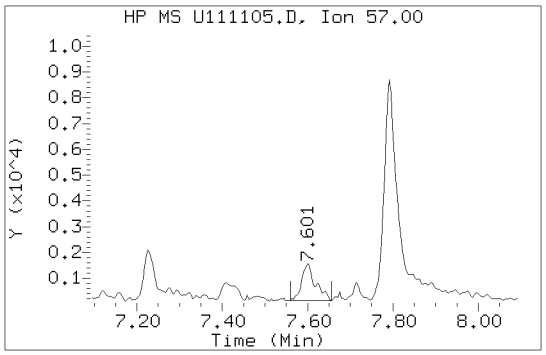
BEFORE

MASS
57
AREA
3259
HEIGHT
1441
16-Nov-2022
09:38
linh
pham



AFTER

MASS
57
AREA
3259
HEIGHT
1441
16-Nov-2022
09:41
linh
pham

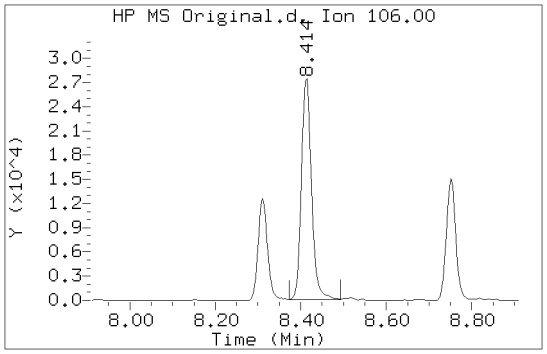


m,p-Xylenes ()

Reason Code:

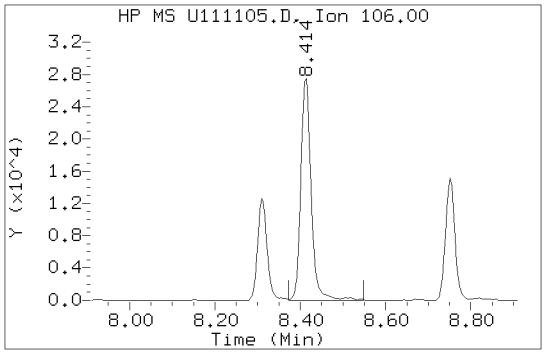
BEFORE

MASS
106
AREA
46362
HEIGHT
27406
16-Nov-2022
09:38
linh
pham



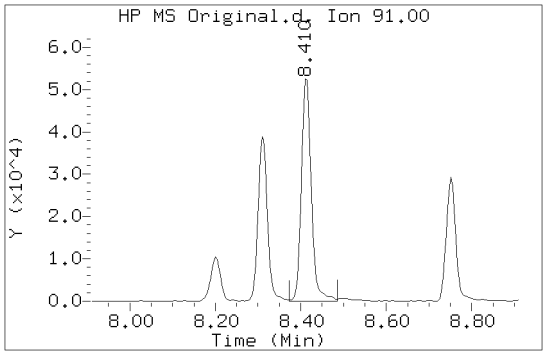
AFTER

MASS
106
AREA
47631
HEIGHT
27496
16-Nov-2022
09:41
linh
pham



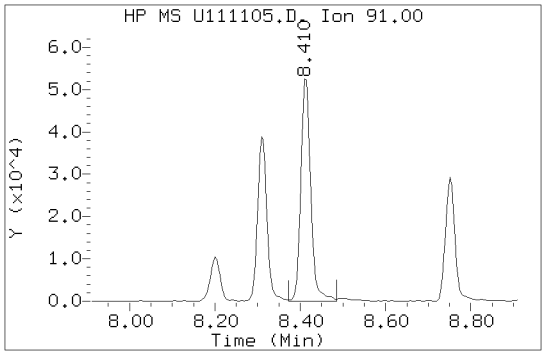
BEFORE

MASS
91
AREA
86830
HEIGHT
52475
16-Nov-2022
09:38
linh
pham



AFTER

MASS
91
AREA
86830
HEIGHT
52475
16-Nov-2022
09:41
linh
pham

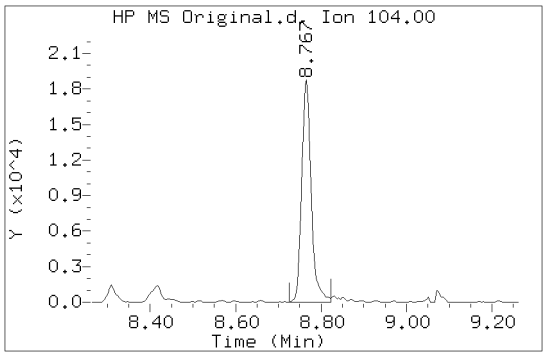


Styrene (100-42-5)

Reason Code:

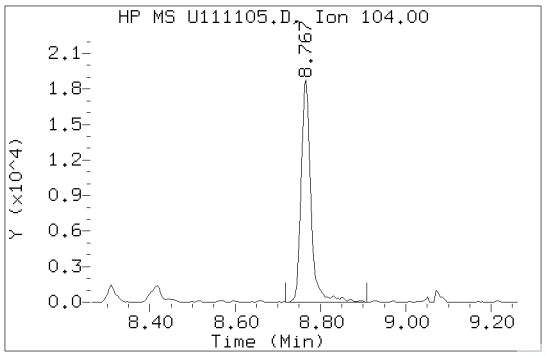
BEFORE

MASS
104
AREA
29906
HEIGHT
18768
16-Nov-2022
09:38
linh
pham



AFTER

MASS
104
AREA
30964
HEIGHT
18768
16-Nov-2022
09:41
linh
pham



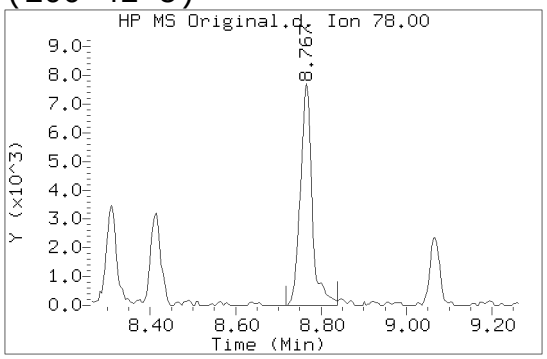
Data File : \\NAHSTWS005\Target\chem\voa9.i\U221111.b\U111105.D
Inj Date : 11-NOV-2022 13:25
InstruID : VOA9.i
LabSampID : VSTD002

Styrene (100-42-5)

Reason Code:

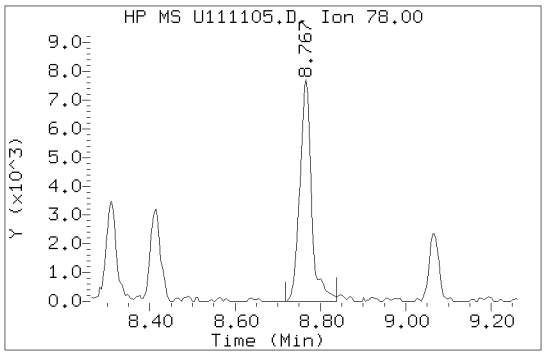
BEFORE

MASS
78
AREA
15064
HEIGHT
7711
16-Nov-2022
09:38
linh
pham



AFTER

MASS
78
AREA
15064
HEIGHT
7711
16-Nov-2022
09:41
linh
pham

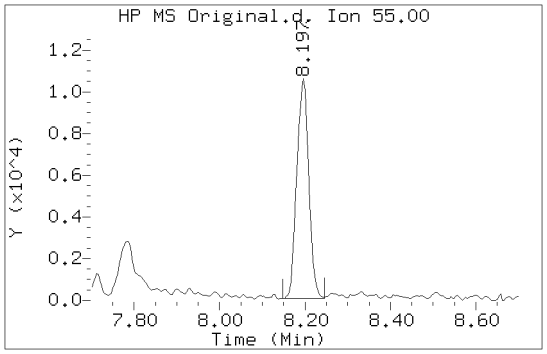


1-Chlorohexane (544-10-5)

Reason Code:

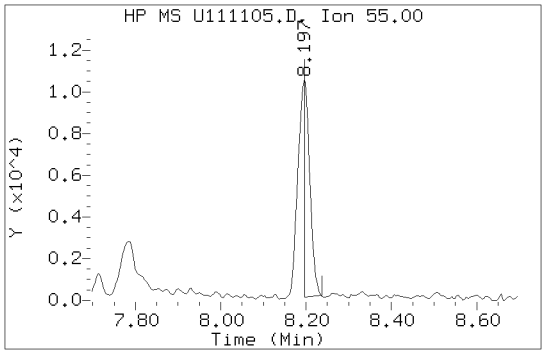
BEFORE

MASS
55
AREA
20998
HEIGHT
10550
16-Nov-2022
09:38
linh
pham



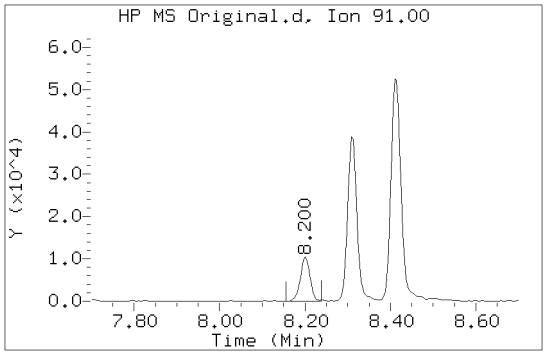
AFTER

MASS
55
AREA
10304
HEIGHT
10491
16-Nov-2022
09:41
linh
pham



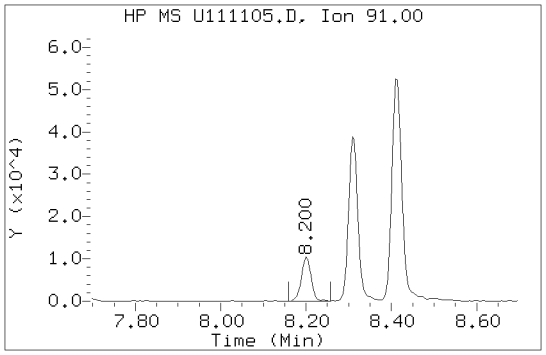
BEFORE

MASS
91
AREA
16655
HEIGHT
10460
16-Nov-2022
09:38
linh
pham



AFTER

MASS
91
AREA
16811
HEIGHT
10460
16-Nov-2022
09:41
linh
pham

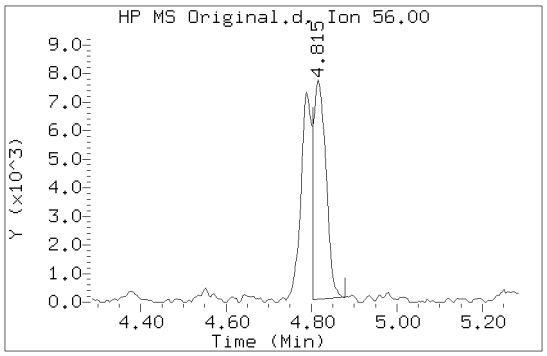


Cyclohexane (110-82-7)

Reason Code:

BEFORE

MASS
56
AREA
15386
HEIGHT
7670
16-Nov-2022
09:38
linh
pham



AFTER

MASS
56
AREA
14256
HEIGHT
7360
16-Nov-2022
09:41
linh
pham