

LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

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**Department of the Army
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KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX***

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A. Title: Report – Draft Final 2017 Remedial Action Operation Report, Landfill 12, LHAAP-12, Longhorn Army Ammunition Plant, Karnack, Texas, September 2018

Author(s): Department of the Army

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

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- F. Title: Report – LHAAP-29 Fact Sheet, Former TNT Production Area
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- G. Title: Report – Draft Final Technical Memorandum – Supplemental Groundwater
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DEPARTMENT OF THE ARMY
 LONGHORN ARMY AMMUNITION PLANT
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 RATCLIFF, AR 72951

September 14, 2018

DAIM-ODB-LO

Mr. Rich Mayer
 U.S. Environmental Protection Agency
 Federal Facilities Section R6
 1445 Ross Avenue
 Dallas, TX 75202-2733

**Re: Draft Final 2017 Remedial Action Operation Report, Landfill-12, LHAAP-12,
 Longhorn Army Ammunition Plant, Karnack, Texas, September 2018**

Dear Mr. Mayer,

One hard copy and one compact disc (CD) of the above-referenced document are being transmitted to you for your records. The document which addresses LHAAP-12 groundwater, includes revisions based upon the Environmental Protection Agency's (EPA) comments on the Draft received on August 15, 2018. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment. Response to comments on the Draft version of the document are included with this Draft Final.

The document was prepared by 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 Kim Nemmers, 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 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
 Longhorn AAP Site Manager

Copies furnished:

- A. Palmie, TCEQ, Austin, TX (letter)
- P. Bruckwicki, Caddo Lake NWR, TX (1 hard copy and 1 CD)
- A. Williams, USACE, Tulsa District, OK (1 CD)
- N. Smith, USAEC, San Antonio, TX (1 CD)
- K. Nemmers, Bhate, Lakewood, CO (1 hard copy and 1 CD)
- P. Srivastav, APTIM, Houston, TX (1 hard copy and 1 CD)



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

September 14, 2018

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

**Re: Draft Final 2017 Remedial Action Operation Report, Landfill-12, LHAAP-12,
Longhorn Army Ammunition Plant, Karnack, Texas, September 2018**

Dear Ms. Palmie,

One hard copy and one compact disc (CD) of the above-referenced document are being transmitted to you for your records. The document which addresses LHAAP-12 groundwater, includes revisions based upon the Environmental Protection Agency's (EPA) comments on the Draft version received on August 15, 2018. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment. Response to comments on the Draft version of the document are included with this Draft Final.

The document was prepared by 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 Kim Nemmers, 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 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is positioned above the typed name.

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished (letter only):
R. Mayer, USEPA Region 6, Dallas, TX
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, Tulsa District, OK
N. Smith, USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

Response to Comments on
Draft 2017 Remedial Action Operation Report, Landfill-12, LHAAP-12
Longhorn Army Ammunition Plant, Karnack, Texas

Document Date: July 10, 2018
Comment Date: August 15, 2018

Reviewer: Mr. Richard Mayer, U.S. Environmental Protection Agency
Respondent: Dr. Rose Zeiler, U.S. Army

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X)
2. Commenter Agrees (A) with response, or Does Not Agree (D) with response

Comment No.	Section/Page/ Paragraph	Comment	C, D, E, or X ¹	Response	A or D ²	Comment
1	Appendix C, Sample Collection Log for Monitoring Well 12WW24	This log is missing data on the table for the purge times of 08:07 and 08:15. Also, for purge time 10:35, is this data taken from a flow thru cell or from bailing the well? From reviewing the DO result of 7.81 mg/L, it must have been taken from a bailer. Please correct and explain. From purge time 08:07 to purge time 08:15, the water level dropped almost six feet (no purge rate was recorded on the table). Also, would re-developing this well be beneficial or has the well always drawn down quickly in the past? The 2017 water level was close to the highest water levels recorded at this well.	C	A bailer was used for sample collection. A bailer was used in 2017 and in the past to bail the well dry. Therefore, there are no parameters available between 8:07 and 8:15. When the well recharged, a sample was collected using a bailer at 10:35. The sample collection log (SCL) for 12WW24 will be revised to indicate that BA, bailer, was used in the Sampling Method and in the Purging Method/Equipment Section. The SCLs will all be revised to indicate the analytical method and included in the Draft Final. This well has consistently drawn down quickly in the past. Based on the well construction information in Appendix A, the well is not silted and therefore does not need any re-development.		
2	General Comment	EPA agrees with the conclusions that the chemicals detected in monitoring well 12WW24 are at a much lower concentration when the water table is at higher levels.	C	Comment noted.		

From: April Palmie <april.palmie@tceq.texas.gov>
Sent: Thursday, August 09, 2018 3:19 PM
To: Watson, Susan; 'Mayer, Richard'
Cc: zeiler Rose (rose.m.zeiler.civ@mail.mil); Williams, Aaron K CIV USARMY CESWF (US); nicholas.b.smith56.civ@mail.mil; Kim Nemmers; paul_bruckwicki@fws.gov; Srivastav, Praveen; Suryanarayanan, Sowmya
Subject: RE: For Review - Remedial Action Operation Report for LHAAP-12 - Upload to Portal

Good afternoon. I've reviewed the Draft Remedial Action Operation Report for LHAAP-12 and have no questions or comments.

April



Draft Final
**2017 Remedial Action Operation
Report, Landfill 12 (LHAAP-12)**
Longhorn Army Ammunition Plant
Karnack, Texas



Prepared for
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Contract No. W9128F-13-D-0012
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Project No. 501032
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Acronyms and Abbreviations

α	critical value
$\mu\text{g/L}$	micrograms per liter
<i>CV</i>	coefficient of variation
<i>n</i>	total number of samples
<i>p</i>	probability value
<i>S</i>	Mann-Kendall statistic, sum of the scores
$\bar{X}$	mean concentration
AECOM	AECOM Technical Services, Inc.
APTIM	Aptim Federal Services, LLC
Bhate	Bhate Environmental, Inc.
BRAC	Base Realignment and Closure
CLNWR	Caddo Lake National Wildlife Refuge
COC	contaminant of concern
DCE	dichloroethene
ERS	Environmental Remediation Services
ft/ft	feet vertical per foot horizontal
GW-Ind	groundwater medium-specific concentration for industrial use
IRA	interim remedial action
LHAAP	Longhorn Army Ammunition Plant
LHAAP-12	Landfill 12
LUC	land use control
MATOC	Multiple Award Task Order Contract
MCL	maximum contaminant level
MEGA	Multiple Environmental Government Acquisition
MMRP	Military Munitions Response Program
MNA	monitored natural attenuation
No.	number
RA(O)	remedial action operation
RD	remedial design
ROD	record of decision
TCE	trichloroethene
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VC	vinyl chloride
VOC	volatile organic compound

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1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Tulsa District, on behalf of the U.S. Army Base Realignment and Closure (BRAC) Division contracted Bhate Environmental, Inc. (Bhate) under the Omaha Multiple Environmental Government Acquisition (MEGA) National Small Business Multiple Award Task Order Contract (MATOC), Environmental Remediation Services (ERS) with Military Munitions Response Program (MMRP), Task Order No. W9128BV17F0150, to conduct environmental restoration at multiple sites at the former Longhorn Army Ammunition Plant (LHAAP). The Bhate Team is comprised of Bhate and Aptim Federal Services, LLC (APTIM). APTIM is conducting the groundwater monitoring and site inspection activities as described in the *Final Remedial Design Addendum Landfill 12 (LHAAP-12)* (Shaw 2007). LHAAP-12 was transferred to the U.S. Fish and Wildlife Service (USFWS) as part of the Caddo Lake National Wildlife Refuge (CLNWR) in 2014. This report summarizes the results of December 2017 groundwater sampling and the July 2017 landfill integrity inspections and repairs, the 10th Remedial Action Operation (RA[O]) Report since the Remedial Design (RD) Addendum was finalized in 2007 (Shaw 2007).

1.1 Remedial Action Objectives

Work completed in 2017 as part of the RA(O) at LHAAP-12 consisted of the following components: physical inspections and repairs; groundwater monitoring; and concentration trend analysis. Physical inspections are conducted at a minimum annually to confirm compliance with land use control (LUC) objectives, which consist of ensuring the integrity of the existing landfill cover, and ensuring no exposure of trichloroethene (TCE)-contaminated groundwater.

The objectives for groundwater monitoring at LHAAP-12 are to provide groundwater data to:

- Determine the effectiveness of natural attenuation in reducing contaminant concentrations over time
- Evaluate plume migration to ensure that TCE-contaminated groundwater does not impact nearby surface water
- Perform trend analysis of groundwater contaminants of concern (COCs): TCE, cis-1,2-dichloroethene (DCE), and vinyl chloride (VC)
- Perform a comparison of the COC concentration trends to their maximum contaminant levels (MCLs)

The remedy at LHAAP-12 is functioning as intended and all human risks are currently under control. This report summarizes the results of groundwater sampling and the landfill integrity inspections and repairs.

1.2 Site Description

LHAAP-12 was established in 1963, covers approximately seven acres, and is 500 feet southeast of Central Creek, which eventually drains into Caddo Lake. LHAAP-12 was used for the disposal of industrial solid wastes, possibly containing small quantities of hazardous constituents generated at LHAAP. From 1978 until its closure in April 1994, the landfill was used continuously for the disposal of non-hazardous industrial solid waste, including cafeteria waste, chemical waste, petroleum-contaminated soil, and asbestos. The construction of a landfill cap over the site was completed in 1998 as part of an interim remedial action (IRA). The IRA is consistent with U.S. Environmental Protection Agency presumptive remedy guidance. The final remedy for LHAAP-12 is protective of human health and the environment and consists of LUCs in conjunction with monitored natural attenuation (MNA). LUCs include those set in place by the *Final Record of Decision, Landfill 12 (LHAAP-12)* (Shaw 2006) for landfill cap maintenance and restriction of groundwater use.

2017 REMEDIAL ACTION OPERATION REPORT, LANDFILL 12 (LHAAP-12)

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2.0 OPERATIONS AND MAINTENANCE ACTIVITIES AT LHAAP-12

2017 REMEDIAL ACTION OPERATION REPORT, LANDFILL 12 (LHAAP-12)

Operation, maintenance and physical inspection activities at LHAAP-12 consist of:

- Maintenance of the integrity of the landfill cap and repairs to desiccation cracks, erosion, or gulying upon observance.
- Maintenance of the vegetative cover on the landfill cap, including periodic mowing.
- Maintenance of the signage around the landfill cap.
- Prohibition of any activities that would affect the integrity of the cap.
- Prohibition of any activities that would cause exposure to contaminated groundwater.

Inspections of the well field are conducted and the information is recorded on well inspection forms (**Appendix A**). Maintenance or repairs are then conducted, as needed, based on observed conditions.

Mowing the sampling area for brush and weeds is conducted on a routine basis, and as needed, to access the well field. Mowing activities are conducted more frequently during the warmer spring and summer months and less frequently during the colder fall and winter seasons. In 2017, mowing was conducted on 19 May 2017 and 11 Jul 2017.

The RD Addendum stipulated physical inspections to be conducted annually, although actual inspections are conducted more frequently with periodic drive-by oversight to ensure compliance with the above requirements and annual groundwater sampling to monitor the effectiveness of natural attenuation in reducing contaminant concentrations over time. The effectiveness of MNA was evaluated in the Annual Remedial Action Operations Report for Years 1 and 2 (Shaw 2011). Groundwater was included as a component of the remedy for LHAAP-12 identified in the Record of Decision (ROD) (Shaw 2006).

2.1 Physical Inspection Summary

During the July 2017 inspection, the landfill appeared to be in good condition. No erosion, cracks, no further erosion was evident, and signage remained in good condition. No evidence of animal burrowing in the cap was found. No change in land or groundwater use was observed at the site, and the use of the site is consistent with the LUCs mandated by the ROD (Shaw 2006). No other significant issues were identified regarding the cap condition or maintenance, signs, or site use. The vegetative cover was observed in good condition and well maintained

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during routine mowing with no excessive cracking or desiccation cracks. Photos of the signs and wells were collected in July 2017, and no damage to bollards, pads, or protective casings was observed and minimal encroachment of weeds or brush on the well pads was observed. Signs were all visible around the landfill. Photos of the signs and wells are provided in **Appendix A**.

The official 2017 physical inspection of the LHAAP-12 cap was completed on 26 Jul 2017 and the LUC Inspection and Maintenance Log is included in **Appendix B**.

A follow-up well inspection was conducted in March 2018 to document the condition of the wells. No damage to bollards, pads, or protective casings was observed, and minimal encroachment of weeds or brush on the well pads was observed. Well head locks continue to be in good condition. The March 2018 well inspection forms are provided in **Appendix A**.

2.2 Groundwater Monitoring and Analytical Results

The purpose of sampling was to develop data to support the effectiveness of natural attenuation in reducing contaminant concentrations over time, to evaluate plume migration, and to ensure that TCE-contaminated groundwater does not impact nearby surface water. As described by the Groundwater Sampling Plan included in the RD Addendum (Shaw 2007), annual groundwater sampling of three on-site monitoring wells (12WW20, 12WW21, and 12WW24) and two downgradient compliance monitoring wells (12WW22 and 12WW23) was to be conducted annually beginning in the third year of the RA(O) (i.e., 2010). As recommended in the 2014 RA(O) Report (AECOM 2015), the frequency of sampling of monitoring well 12WW22 was changed to once every five years and sampling was discontinued at well 12WW23. The locations of these groundwater monitoring wells are shown in **Figure 2-1**. Therefore, the sampling event in December 2017 included the three on-site wells 12WW20, 12WW21, and 12WW24.

All monitoring wells were in good condition and no evidence of turbidity or silt accumulation was identified during the sampling and gauging event. The groundwater elevations from the three wells sampled in December 2017 are shown on **Figure 2-2a**. In both December 2016 and December 2017, the localized gradient around these three wells is towards the north; however, the overall site gradient was to the northeast in 2016 based on the additional wells gauged during that sampling event, and it is likely that the overall gradient was the same in December 2017, but is not shown because the additional wells were not gauged during the sampling event. The depth to water readings and tabulated well information is provided in **Table 2-1**.

In March 2018, a gauging event was conducted during the physical inspection of the wells and included eight wells at LHAAP-12 (12WW01, 12WW02, 12WW05, 12WW20, 12WW21, 12WW22, 12WW23, and 12WW24). The groundwater measurements collected in March 2018

indicate an easterly groundwater flow as shown on **Figure 2-2b**. The groundwater elevation in March 2018 was slightly higher than in December 2017. The hydraulic gradient based on March 2018 data was 0.005 feet vertical per foot horizontal (ft/ft). The well siltation information for all these wells from the March 2018 event has been included in **Appendix A**. Based on these observations, the wells at LHAAP-12 are not silted and do not need additional repair.

Groundwater samples were collected in December 2017 using the low-flow method following Standard Operating Procedure (AECOM 2013). The objective of using low-flow sampling method is to collect representative samples of the groundwater in the formation adjacent to the well screen, eliminating the mixing of stagnant water above and below the well screen. After water quality parameters stabilized and were within acceptable ranges, samples were collected at the same low flow rate. Groundwater monitoring well sampling forms were completed for each monitoring well sampled and are included in **Appendix C**. Laboratory analytical results are included in **Appendix D**.

Annual groundwater samples were collected on 4 Dec 2017 from 12WW20, 12WW21, and 12WW24, and were analyzed for volatile organic compounds (VOCs) according to SW-846 Method 8260 and 1,4-dioxane according to Method 8270. 1,4-Dioxane is not a site COC and was analyzed to support the Five Year Review. Any additional evaluation/discussion regarding 1,4-dioxane will be discussed in the Five Year Review Report. No VOCs were detected in monitoring wells 12WW20 and 12WW21. Among the detected VOCs in monitoring well 12WW24, only TCE exceeded its respective MCL of 5 micrograms per liter (µg/L). TCE concentration at monitoring well 12WW24 reduced from 151 µg/L in December 2016 to 83 µg/L in December 2017. Analytical results for the samples are shown in **Table 2-2**. Historical TCE concentrations for LHAAP-12 wells are shown in **Table 2-3**.

The MNA evaluation completed as part of the Five-Year Review (AECOM 2014), concluded that TCE degradation was occurring via anaerobic reductive dechlorination. Although an increasing trend in TCE concentration was observed in well 12WW24 in December 2013 and January 2015, a decreasing trend has been observed over the past three sampling events, December 2015, December 2016, and December 2017 (see **Figure 2-3** for 12WW24). TCE concentration trends appear to correlate with fluctuating water levels because samples collected when the water table is high tend to have lower TCE concentrations. The groundwater elevation presented on **Figure 2-3** indicates an inverse correlation with constituent concentrations. The presence of cis-1,2-DCE and VC indicates that degradation by anaerobic reductive dechlorination is occurring. However, the concentration trends for these degradation products mimic those of TCE, suggesting that dilution and dispersion is the dominant natural attenuation pathway. Groundwater TCE concentrations for all wells can be found in **Table 2-3**. The December 2017 concentrations are shown on **Figure 2-4**.

Statistical analysis of the concentration profile for TCE in 12WW24 using the Mann-Kendall trend analysis was completed for the data collected through the 10th year RA(O) period. The results are shown in **Appendix E**. The Mann-Kendall trend test was performed for the 2017 RA(O) report using data from the beginning of the monitoring program in December 2006 through December 2017 and indicated a statistically significant decreasing trend at the 95% confidence level for TCE concentrations in monitoring well 12WW24. A drought persisted between 2011 and 2012 and resulted in decreased groundwater levels and well 12WW24 going dry and not being sampled in 2012. However, after the groundwater level in 12WW24 had recovered from being dry, TCE concentrations increased during the December 2013 and January 2015 sampling events, before declining during the December sampling events in 2015, 2016, and 2017. Additional annual sampling is necessary for the next five year review when the trends will continue to be evaluated for statistical significance and a decrease of sampling frequency. The decreasing contaminant trend combined with the lack of detected VOCs in the downgradient wells provide evidence that the plume is stable and natural attenuation is occurring, resulting in an overall decrease in TCE concentration in groundwater over time. The presence of cis-1,2-DCE and VC in this well since December 2006 also indicates that biodegradation has been occurring.

The TCE trend in 12WW24 as shown in **Figure 2-3** was used to calculate a first order decay rate. Two calculations have been made; the first for the dataset through June 2011 and the second for the dataset that includes all results through December 2017. The reason for the two calculations is because drought conditions evidenced by the dry well in December 2012 later manifested in an increase in TCE concentration in this well in the December 2013, and January 2015 sampling events. However, the water levels have been increasing since the well was dry in December 2012 and an overall decrease in TCE concentration has also been observed. The first order rate constant for the period through June 2011 was 6.2E-04 per day while the first order rate constant for the entire dataset was 1.5 E-04 per day, an implied decrease of less than one order of magnitude. Based on these rate constants, the estimated durations to achieve the MCL for TCE in 12WW24 are 15 years using the rate constant for the dataset through June 2011 and approximately 51 years using the rate constant for the entire dataset. The drought conditions along with changes in seasonal sampling have constrained the trends observed.

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3.0 CONCLUSIONS

Physical inspections and groundwater monitoring continue to be completed at LHAAP-12 in compliance with the ROD for LHAAP-12 (Shaw 2006). No damage to bollards, pads, or protective casings was observed, and limited encroachment of weeds or brush on the well pads was observed. No change in land or groundwater use has occurred at the site. No issues were identified during the official 2017 physical inspection of the LHAAP-12 cap completed on 26 Jul 2017. LUCs were verified, and the use of the site is still consistent with that mandated by the ROD. Annual LUC inspections will continue to be conducted annually.

In accordance with the Groundwater Sampling Plan, found in Appendix A of the RD Addendum for LHAAP-12 (Shaw 2007), annual sampling of wells will continue until the next Five-Year Review. Results for Year 10 are documented in this report.

The groundwater gauging event from December 2017 indicates the isolated flow near the three wells 12WW20, 12WW21 and 12WW24 is to the north and consistent with the December 2016 gauging event. An additional gauging event was conducted in March 2018 and included eight wells: 12WW01, 12WW02, 12WW05, 12WW20, 12WW21, 12WW22, 12WW23 and 12WW24. The March 2018 indicates an easterly gradient similar to the most prevalent historic flow direction. The monitoring wells will continue to be gauged and inspected as part of future sampling events.

Monitoring wells 12WW20, 12WW21 and 12WW24 were sampled on 4 Dec 2017 for VOCs. No VOCs were detected in 12WW20 and 12WW21. At 12WW24, TCE was detected above its MCL of 5 µg/L at 83 µg/L. This was a decrease from the December 2016 TCE concentration of 151 µg/L. None of the other detected compounds exceeded their respective MCLs. TCE concentrations in 12WW24 showed a statistically significant decreasing trend.

When compared to VOC concentrations, the groundwater elevation data (**Figure 2-3**) exhibits an inverse correlation with VOC concentrations in 12WW24. The increase in TCE in the December 2013 and January 2015 sampling events in 12WW24 is thought to be associated with low water levels and sampling during drought conditions, as these were the first samples collected since the well was dry due to drought conditions in 2012. Water levels have continued to increase since the drought, and the TCE concentration from the 4 Dec 2017 sampling has been the lowest since 2006 as groundwater elevation increased slightly.

The three wells (12WW20, 12WW21, and 12WW24) will continue to be sampled annually for VOCs. Any change in this frequency will be evaluated in the next five year review.

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4.0 REFERENCES

AECOM Technical Services, Inc. (AECOM). 2013. *Standard Operating Procedures, Groundwater Sampling Procedures*. Longhorn Army Ammunition Plant, Karnack, Texas. June.

AECOM. 2014. *Final 2013 Five-Year Review Report*. Longhorn Army Ammunition Plant, Karnack, Texas. May.

AECOM. 2015. *Draft Final 2014 Remedial Action Operation Report*. Longhorn Army Ammunition Plant, Karnack, Texas. May.

Gilbert, R. O. 1987. *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold, New York, NY. ISBN 0-442-23050-8.

Hollander, M. and Wolfe, D. A. 1973. *Nonparametric Statistical Methods*, Wiley, New York, NY.

Shaw Environmental & Infrastructure, Inc. (Shaw). 2006. *Final Record of Decision, Landfill 12 (LHAAP-12)*. Longhorn Army Ammunition Plant, Karnack, Texas. August.

Shaw. 2007. *Final Remedial Design Addendum Landfill 12 (LHAAP-12)*, Longhorn Army Ammunition Plant, Karnack, Texas. June.

Shaw. 2011. *Draft Annual Remedial Action Operation Report, Years 1 and 2, Landfill 12 (LHAAP-12)*, Longhorn Army Ammunition Plant, Karnack, Texas. June.

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Tables

Table 2-1**Groundwater Elevation Data, LHAAP-12**

Well ID	Sampling Date	Top of Casing Elevation (ft)	Depth to Water from TOC (ft)	Groundwater Elevation (ft AMSL)	Total Depth BGS (ft)	Screen Interval BGS (ft)
12WW01	12/1/2016 ^a	204.19	23.60	180.59	26.5	14.50-26.50
	3/27/2018 ^a	204.19	23.55	180.64		
12WW02	12/1/2016 ^a	202.45	22.07	180.38	28.50	13.50-28.50
	3/27/2018 ^a	202.45	21.82	180.63		
12WW05	12/1/2016 ^a	190.52	9.88	180.64	38.00	15.50-35.50
	3/27/2018 ^a	190.52	8.05	182.47		
12WW20	6/15/2010	199.15	17.98	181.17	38.85	28.85-38.85
	6/7/2011	199.15	19.78	179.37		
	12/3/2012	199.15	22.03	177.12		
	1/8/2014	199.15	20.71	178.44		
	1/9/2015	199.15	19.34	179.81		
	12/19/2015	199.15	19.00	180.15		
	12/1/2016	199.15	18.69	180.46		
	12/4/2017	199.15	18.8	180.35		
12WW21	3/27/2018	199.15	17.6	181.55	41.70	31.70-41.70
	6/15/2010	202.07	21.85	180.22		
	6/7/2011	202.07	23.35	178.72		
	12/3/2012	202.07	24.21	177.86		
	1/8/2014	202.07	24.56	177.51		
	1/9/2015	202.07	24.35	177.72		
	12/19/2015	202.07	22.95	179.12		
	12/1/2016	202.07	21.97	180.10		
12WW22	12/4/2017	202.07	21.92	180.15	38.36	28.36-38.36
	3/27/2018	202.07	21.42	180.65		
	6/15/2010	190.20	7.93	182.27		
	6/7/2011	190.20	9.72	180.48		
	12/3/2012	190.20	13.46	176.74		
	1/8/2014	190.20	10.57	179.63		
	1/9/2015	190.20	9.60	180.60		
	12/1/2016	190.20	10.32	179.88		
12WW23	3/27/2018 ^a	190.20	7.81	182.39	25.14	15.14-25.14
	6/16/2010	196.97	18.28	178.69		
	6/7/2011	196.97	19.40	177.57		
	12/3/2012	196.97	20.38	176.59		
	1/8/2014	196.97	20.80	176.17		
	1/9/2015	196.97	19.34	177.63		
	12/1/2016	196.97	17.23	179.74		
12WW24	3/27/2018 ^a	196.97	16.88	180.09	26.00	15.50-25.50
	6/16/2010	203.17	22.50	180.67		
	6/7/2011	203.17	24.15	179.02		
	12/3/2012	203.17	Dry	Dry		
	12/9/2013	203.17	26.00	177.17		
	1/9/2015	203.17	24.22	178.95		
	12/18/2015	203.17	23.50	179.67		
	11/30/2016	203.17	22.53	180.64		
	12/4/2017	203.17	22.61	180.56		
	3/27/2018	203.17	22.35	180.82		

Notes:^a This well was not sampled; the date presented is the date of the water level measurement.

AMSL - above mean sea level

ft - feet

BGS - below ground surface

TOC - top of casing

Table 2-2**2017 Sample Results, LHAAP-12**

	Location Code		12WW20		12WW21				12WW24	
	Sample ID		12WW20-120417		12WW21-120417		12WW21-120417-FD		12WW24-120417	
	Sample Date		12/4/2017		12/4/2017		12/4/2017		12/4/2017	
	Depth		18.87 - 19.02		21.99 - 22.16		21.99 - 22.16		22.61 - 22.75	
	Sample Purpose		REG		REG		FD		REG	
Parameter	Units	MCL/ GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Field Tests										
Conductivity	mS/cm		1.3		5.23				1.6	
Dissolved oxygen	mg/L		0.43		0.14				7.81	
Flow Rate	mL/Min		100		100				100	
Oxidation-Reduction Potential	mV		331		208				125	
pH	STD UNIT		5.13		5.16				5.43	
Temperature	C		20.99		19.66				20.96	
Total Purge	L		0.91		0.91					
Turbidity	NTU		2.7		10.8				21.9	
Water Level at Reading Time	ft btoc		19.02		22.16				22.75	
Volatiles										
1,1,1,2-Tetrachloroethane	µg/L	35	< 1	U	< 1	U	< 1	U	< 1	U
1,1,1-Trichloroethane	µg/L	200	< 1	U	< 1	U	< 1	U	< 1	U
1,1,2,2-Tetrachloroethane	µg/L	4.26	< 1	U	< 1	U	< 1	U	< 1	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	NV	< 1	U	< 1	U	< 1	U	< 1	U
1,1,2-Trichloroethane	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U
1,1-Dichloroethane	µg/L	4,900	< 1	U	< 1	U	< 1	U	< 1	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	0.58	
1,1-Dichloropropene	µg/L	9.1	< 1	U	< 1	U	< 1	U	< 1	U
1,2,3-Trichlorobenzene	µg/L	73	< 1	UJ	< 1	U	< 1	U	< 1	U
1,2,3-Trichloropropane	µg/L	0.03	< 1	U	< 1	U	< 1	U	< 1	U
1,2,4-Trichlorobenzene	µg/L	70	< 1	U	< 1	U	< 1	U	< 1	U
1,2,4-Trimethylbenzene	µg/L	1,200	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dibromoethane	µg/L	0.05	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dichlorobenzene	µg/L	600	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U
1,2-Dichloropropane	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U
1,3,5-Trimethylbenzene	µg/L	1,200	< 1	U	< 1	U	< 1	U	< 1	U
1,3-Dichlorobenzene	µg/L	730	< 1	U	< 1	U	< 1	U	< 1	U
1,3-Dichloropropane	µg/L	9.1	< 1	U	< 1	U	< 1	U	< 1	U
1,4-Dichlorobenzene	µg/L	75	< 1	U	< 1	U	< 1	U	< 1	U
2,2-Dichloropropane	µg/L	13	< 1	U	< 1	U	< 1	U	< 1	U
2-Butanone	µg/L	15,000	< 2	U	< 2	U	< 2	U	< 2	U

Table 2-2**2017 Sample Results, LHAAP-12**

	Location Code		12WW20		12WW21				12WW24	
	Sample ID		12WW20-120417		12WW21-120417		12WW21-120417-FD		12WW24-120417	
	Sample Date		12/4/2017		12/4/2017		12/4/2017		12/4/2017	
	Depth		18.87 - 19.02		21.99 - 22.16		21.99 - 22.16		22.61 - 22.75	
	Sample Purpose		REG		REG		FD		REG	
Parameter	Units	MCL/ GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
2-Chlorotoluene	µg/L	490	< 1	U	< 1	U	< 1	U	< 1	U
2-Hexanone	µg/L	120	< 2	U	< 2	U	< 2	U	< 2	U
4-Chlorotoluene	µg/L	490	< 1	U	< 1	U	< 1	U	< 1	U
Acetone	µg/L	22,000	< 2	U	< 2	U	< 2	U	< 2	U
Benzene	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U
Bromobenzene	µg/L	200	< 1	U	< 1	U	< 1	U	< 1	U
Bromochloromethane	µg/L	980	< 1	U	< 1	U	< 1	U	< 1	U
Bromodichloromethane	µg/L	15	< 1	U	< 1	U	< 1	U	< 1	U
Bromoform	µg/L	120	< 1	U	< 1	U	< 1	U	< 1	U
Bromomethane	µg/L	34	< 1	U	< 1	U	< 1	U	< 1	U
Carbon disulfide	µg/L	2,400	< 2	U	< 2	U	< 2	U	< 2	U
Carbon tetrachloride	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U
Chlorobenzene	µg/L	100	< 1	U	< 1	U	< 1	U	2.1	
Chloroethane	µg/L	98,000	< 1	U	< 1	U	< 1	U	< 1	U
Chloroform	µg/L	240	< 1	U	< 1	U	< 1	U	< 1	U
Chloromethane	µg/L	70	< 1	U	< 1	U	< 1	U	< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	< 1	U	< 1	U	26	
cis-1,3-Dichloropropene	µg/L	1.7	< 1	U	< 1	U	< 1	U	< 1	U
Dibromochloromethane	µg/L	11	< 1	U	< 1	U	< 1	U	< 1	U
Dibromomethane	µg/L	120	< 1	U	< 1	U	< 1	U	< 1	U
Dichlorodifluoromethane	µg/L	4,900	< 1	UJ	< 1	U	< 1	U	< 1	U
Ethylbenzene	µg/L	700	< 1	U	< 1	U	< 1	U	< 1	U
Hexachlorobutadiene	µg/L	12	< 1	U	< 1	U	< 1	U	< 1	U
Isopropylbenzene	µg/L	2,400	< 1	U	< 1	U	< 1	U	< 1	U
m,p-Xylenes	µg/L	10,000	< 2	U	< 2	U	< 2	U	< 2	U
Methyl isobutyl ketone	µg/L	NV	< 2	U	< 2	U	< 2	U	< 2	U
Methylene chloride	µg/L	5	< 2	U	< 2	U	< 2	U	< 2	U
Naphthalene	µg/L	490	< 1	UJ	< 1	U	< 1	U	< 1	U
n-Butylbenzene	µg/L	1,200	< 1	U	< 1	U	< 1	U	< 1	U
n-Propylbenzene	µg/L	980	< 1	U	< 1	U	< 1	U	< 1	U
o-Xylene	µg/L	10,000	< 1	U	< 1	U	< 1	U	< 1	U
p-Isopropyltoluene	µg/L	2,400	< 1	U	< 1	U	< 1	U	< 1	U
sec-Butylbenzene	µg/L	980	< 1	U	< 1	U	< 1	U	< 1	U
Styrene	µg/L	100	< 1	U	< 1	U	< 1	U	< 1	U

Table 2-2**2017 Sample Results, LHAAP-12**

	Location Code		12WW20		12WW21				12WW24	
	Sample ID		12WW20-120417		12WW21-120417		12WW21-120417-FD		12WW24-120417	
	Sample Date		12/4/2017		12/4/2017		12/4/2017		12/4/2017	
	Depth		18.87 - 19.02		21.99 - 22.16		21.99 - 22.16		22.61 - 22.75	
	Sample Purpose		REG		REG		FD		REG	
Parameter	Units	MCL/ GW-Ind	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
tert-Butylbenzene	µg/L	980	< 1	U	< 1	U	< 1	U	< 1	U
Tetrachloroethene	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U
Toluene	µg/L	1,000	< 1	U	< 1	U	< 1	U	< 1	U
trans-1,2-Dichloroethene	µg/L	100	< 1	U	< 1	U	< 1	U	< 1	U
trans-1,3-Dichloropropene	µg/L	9.1	< 1	U	< 1	U	< 1	U	< 1	U
Trichloroethene	µg/L	5	< 1	U	< 1	U	< 1	U	83	
Trichlorofluoromethane	µg/L	7,300	< 1	U	< 1	U	< 1	U	< 1	U
Vinyl Chloride	µg/L	2	< 1	U	< 1	U	< 1	U	< 1	U

Notes:

Highlighted and bold result indicates concentrations above the MCL.

µg/L - micrograms per liter

< - less than

°C - degrees Celcius

FD - field duplicate

ft btoc - feet below top of casing

GW-Ind - groundwater medium-specific concentration for industrial use

ID - identification

J - estimated value

L - liter

MCL - maximum contaminant levels

mg/L - milligrams per liter

mL/Min - milliliters per minute

mS/cm - milli siemens per centimeter

mV - millivolts

NTU - nephelometric turbidity unit

NV - not established

REG - regulatory

RES-GW MCL - residential groundwater maximum contaminant limit

STD UNIT - standard unit

U - Not detected; The analyte was analyzed for but not detected above the associated method detection

Val Qual - validation qualifier

Table 2-3
Historic TCE Concentrations at LHAAP-12 Monitoring Wells

Sampling Date	Monitoring Wells					
	12WW20	12WW21	12WW22	12WW23	12WW24	12WW25(30) ^a
Dec-06	0.713	ND (1)	ND (1)	ND (1)	396	–
Sep-07	1.34	ND (1)	ND (1)	ND (1)	272	–
Dec-07	1.19	ND (1)	ND (1)	ND (1)	313	–
Mar-08	0.999 J	ND (0.25)	ND (0.25)	ND (0.25)	301	–
Jun-08	1.04	ND (0.25)	ND (0.25)	ND (0.25)	237	–
Sep-08	0.985	ND (0.25)	ND (0.25)	ND (0.25)	185	–
Feb-09	1.18	ND (0.25)	ND (0.25)	ND (0.25)	334	–
Apr-09	0.997	ND (0.25)	ND (0.25)	ND (0.25)	197	–
Jul-09	0.931	ND (0.25)	ND (0.25)	ND (0.25)	204	–
Jun-10	0.353 J	ND (0.25)	ND (0.25)	ND (0.25)	145	–
Jun-11	0.263 J	ND (0.25)	ND (0.25)	ND (0.25)	147	–
Dec-12	0.5 J	0.582 J	ND (0.5)	ND (0.5)	Dry Well	–
Jan-14	5	0.721 J	ND (0.5)	ND (0.5)	259 ^b	–
Aug-14	NS	NS	NS	NS	NS	0.317 J
Jan-15	0.293 J	ND (0.25)	ND (0.25)	ND (0.25)	353	–
Dec-15	ND (0.5)	ND (0.5)	NS	NS	278	–
Dec-16	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	151	–
Dec-17	ND (1)	ND (1)	NS	NS	83	–

Notes:

^a This was a DPT boring grab groundwater sample, no well was subsequently installed.

^b Analyte was diluted 5X

– not sampled

µg/L - micrograms per liter

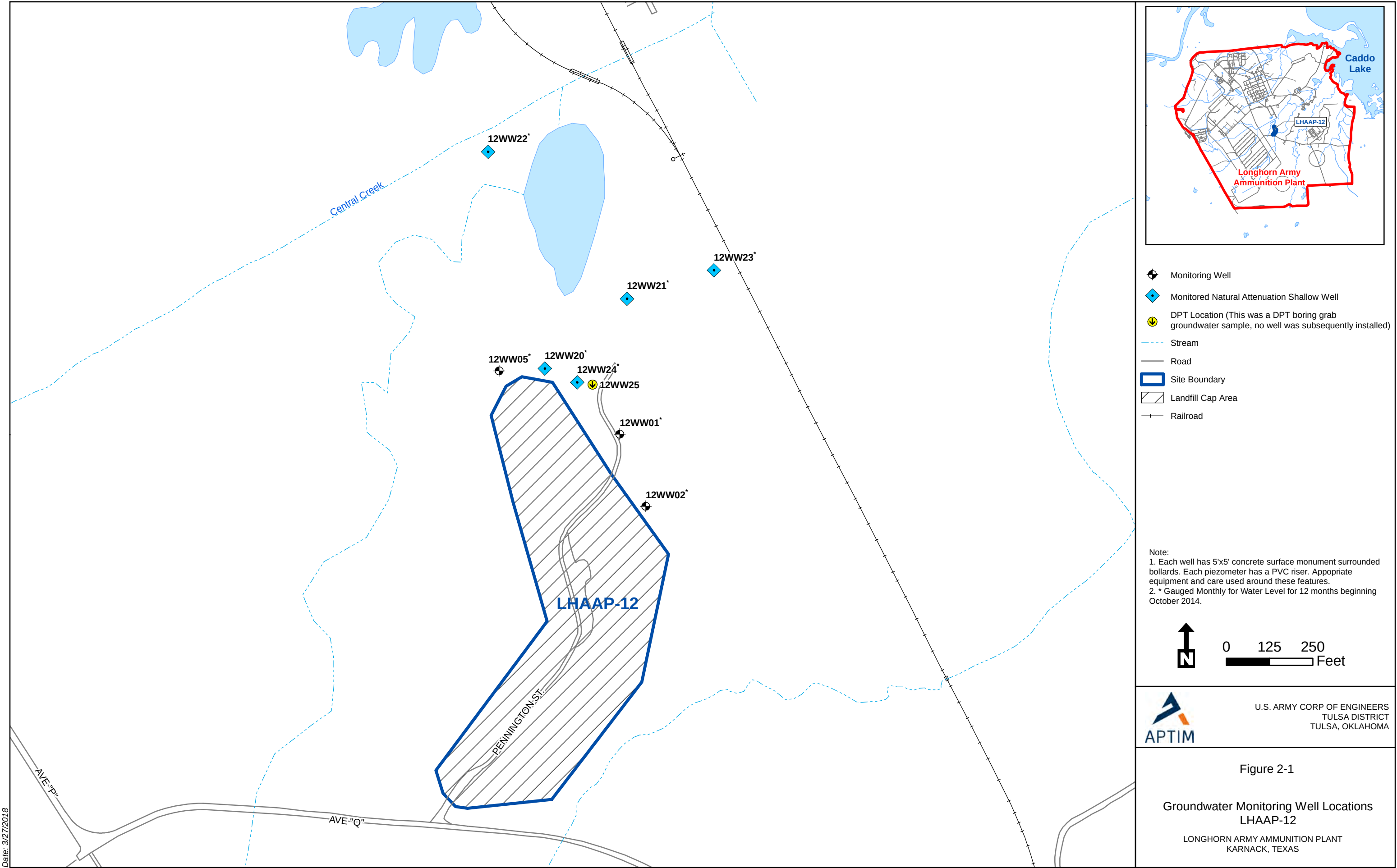
J - estimated value

ND - not detected; values within parentheses denote detection limits.

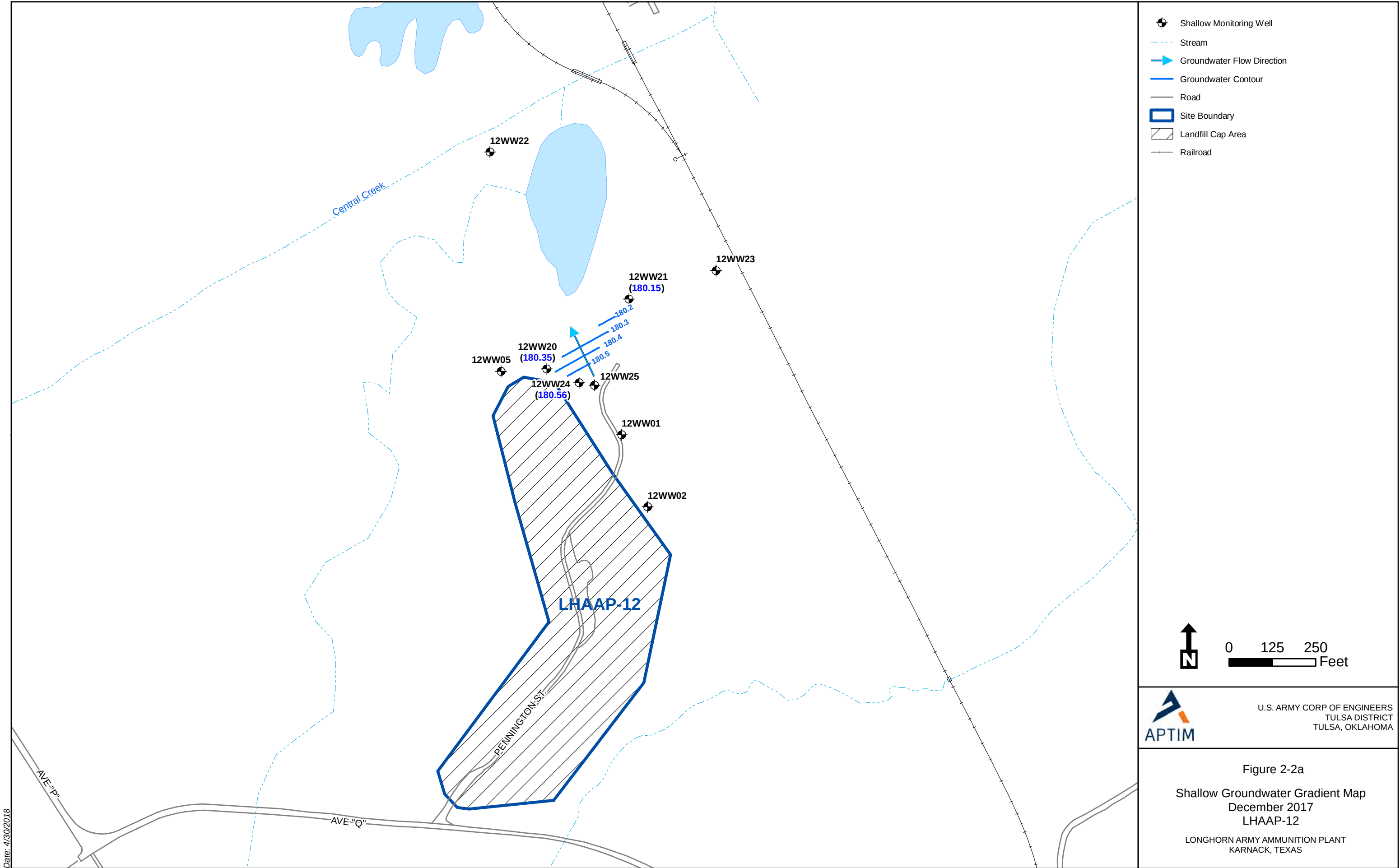
NS - not sampled

TCE - trichloroethene

Figures



Date: 3/27/2018



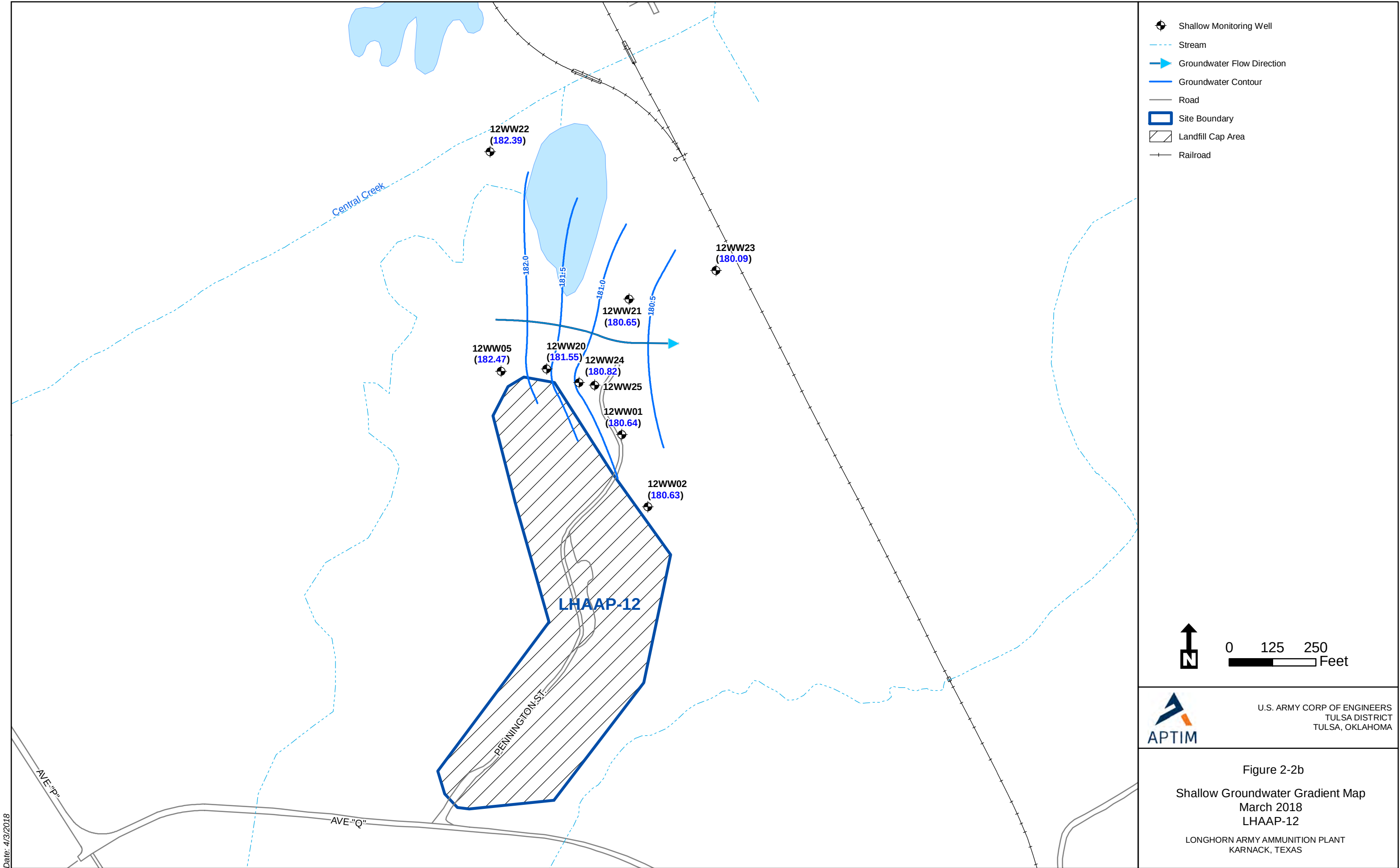
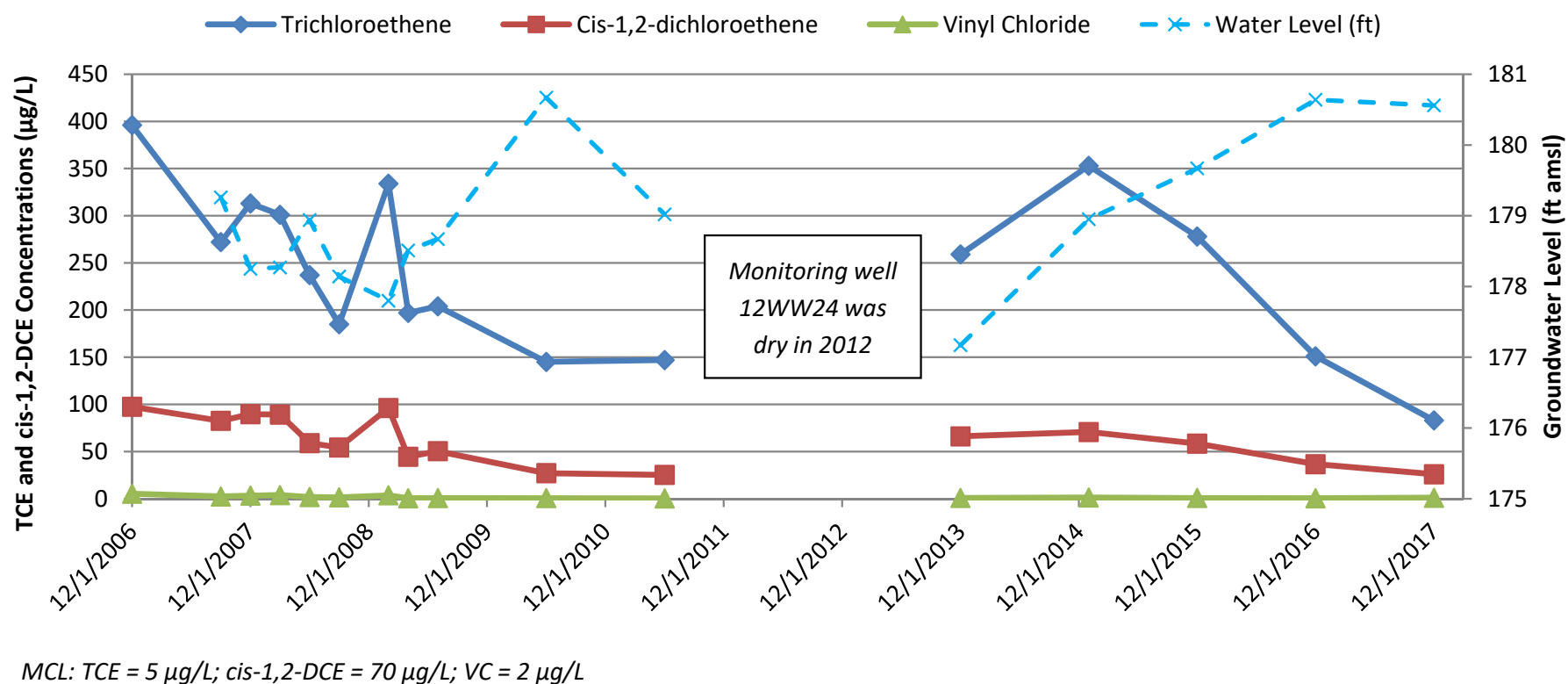
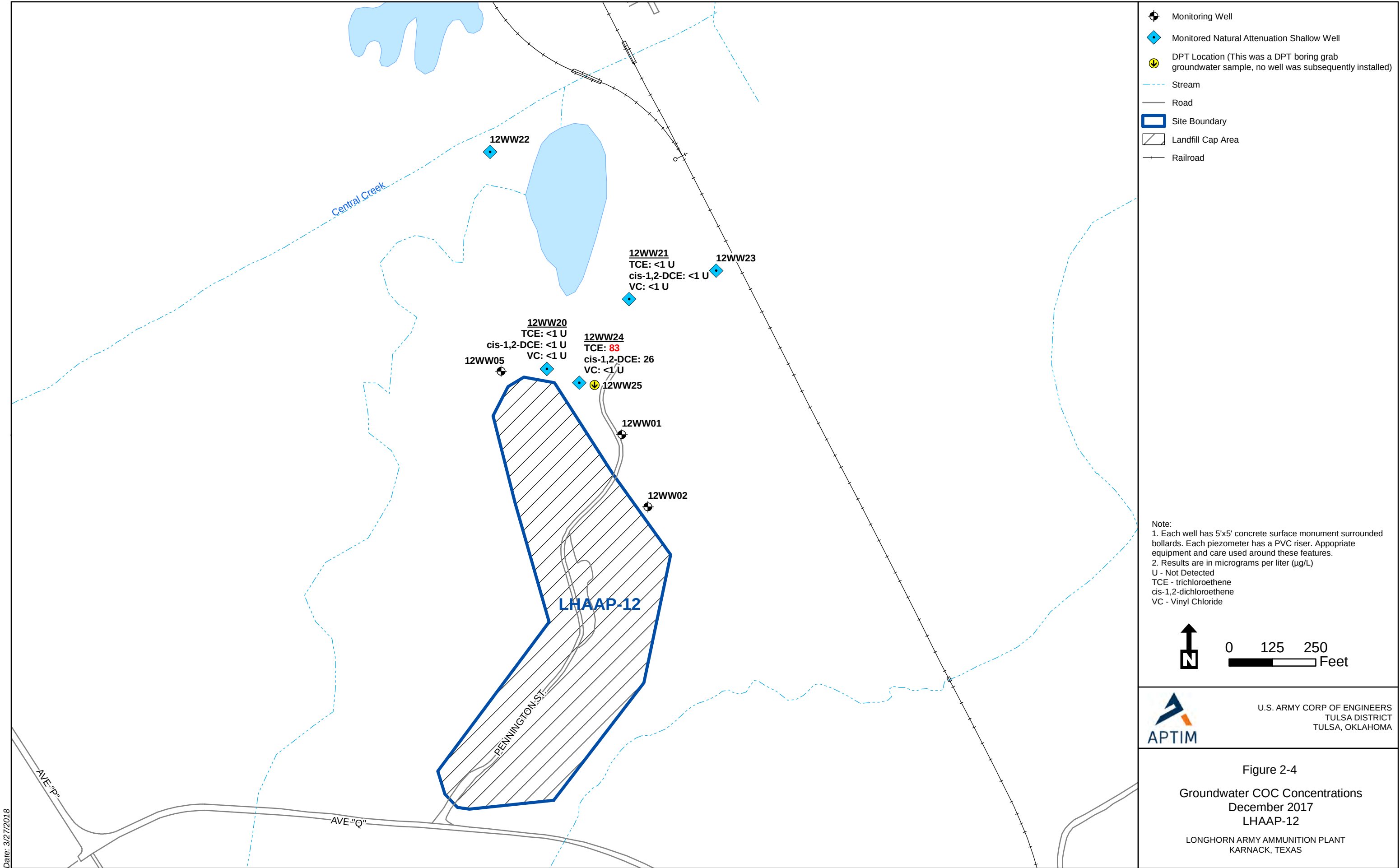


Figure 2-3
TCE, cis-1,2-DCE, and VC Concentrations in 12WW24
LHAAP-12





Appendix A

Photo Log and Well Inspection Forms

APPENDIX A**Photo Log**

Photo No.	Date	Task and Description
1	7/26/2017	Signage along site in good condition
2	7/26/2017	Signage along site in good condition
3	7/26/2017	Monitoring Well 12WW02
4	7/26/2017	Monitoring Well 12WW01
5	7/26/2017	Monitoring Well 12WW24
6	7/26/2017	Monitoring Well 12WW21
7	7/26/2017	Monitoring Well 12WW23
8	7/26/2017	Monitoring Well 12WW20
9	7/26/2017	Monitoring Well 12WW05
10	7/26/2017	Monitoring Well 12WW22



PHOTO 1: Signage along site in good condition



PHOTO 2: Signage along site in good condition



PHOTO 3: Monitoring Well 12WW02



PHOTO 4: Monitoring Well 12WW01



PHOTO 5: Monitoring Well 12WW24



PHOTO 6: Monitoring Well 12WW21



PHOTO 7: Monitoring Well 12WW23



PHOTO 8: Monitoring Well 12WW20



PHOTO 9: Monitoring Well 12WW05



PHOTO 10: Monitoring Well 12WW22

WELL INSPECTION FORM

Job Name: CHAAP-12 Well ID: 12WW24
 Job No.: _____ Inspection Date: 12/4/17
 Client: Army Well Completion Depth/ Measured Depth: ~~28.25~~ 28.25
 Site Name: Site 12 Inspector: Scott Beesinger

☒ ABOVE GROUND

Well Accessible?

☒ Yes ☐ No

Protective casing?

☒ Yes ☐ No

Material

Steel

Condition:

☒ Good ☐ Broken ☐ Cracked ☐ Need Paint

Lid Condition:

☒ Good ☐ Broken ☒ Cracked

Hinge Condition:

☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted☐ FLUSH MOUNTEDNA

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:

WELL INSPECTION FORM

Job Name: LHAAP-12 Well ID: 12WW21
 Job No.: _____ Inspection Date: 12/4/17
 Client: Army Well Completion Depth/ Measured Depth: 41.83
 Site Name: Site 12 Inspector: Scott Beesinger

☒ ABOVE GROUNDWell Accessible? ☒ Yes ☐ NoProtective casing? ☒ Yes ☐ NoMaterial SteelCondition: ☒ Good ☐ Broken ☐ Cracked ☐ Need PaintLid Condition: ☒ Good ☐ Broken ☐ CrackedHinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted☐ FLUSH MOUNTEDWell cover present? NA ☐ Yes ☐ NoCondition: ☐ Good ☐ Broken ☐ CrackedCondition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ NoPad 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 ☐ NoWell lock present? ☒ Yes ☐ NoLock functioning properly? ☒ Yes ☐ NoAre bollards present and stable? ☒ Yes ☐ NoWell ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ NoVisual obstruction? ☐ Yes ☒ NoIs well open to completed depth? (complete when gauging) ☒ Yes ☐ NoIs silt present in well? (complete when gauging) ☐ Yes ☒ NoIs silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LHAAP-12 Well ID: 12ww20
 Job No.: _____ Inspection Date: 12/4/17
 Client: Army Well Completion Depth/ Measured Depth: 39.26
 Site Name: Site 12 Inspector: Scott Beesinger

☒ ABOVE GROUNDWell Accessible? ☒ Yes ☐ NoProtective casing? ☒ Yes ☐ NoMaterial SteelCondition: ☒ Good ☐ Broken ☐ Cracked ☐ Need PaintLid Condition: ☒ Good ☐ Broken ☐ CrackedHinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted☐ FLUSH MOUNTEDWell cover present? NA ☐ Yes ☐ NoCondition: ☐ Good ☐ Broken ☐ CrackedCondition of Sump: ☐ Clean ☐ Dry ☐ Standing Water**CONCRETE PAD:**Sloped away from casing? ☒ Yes ☐ NoPad 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 ☐ NoWell lock present? ☒ Yes ☐ NoLock functioning properly? ☒ Yes ☐ NoAre bollards present and stable? ☒ Yes ☐ NoWell ID visible? ☒ Yes ☐ No**WELL INTEGRITY:**Bailer present? ☐ Yes ☒ NoVisual obstruction? ☐ Yes ☒ NoIs well open to completed depth? (complete when gauging) ☒ Yes ☐ NoIs silt present in well? (complete when gauging) ☐ Yes ☒ NoIs silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No**COMMENTS:**

WELL INSPECTION FORM

Job Name: LonghornWell ID: 12W001

Job No.: _____

Inspection Date: 3/27/18

Client: _____

Well Completion Depth/ Measured Depth: 26.5/27.33Site Name: LHAAP-12Inspector: NIKE MARTINEZ☒ ABOVE GROUNDWell Accessible? ☒ Yes ☐ NoProtective casing? ☒ Yes ☐ NoMaterial: SteelCondition: ☒ Good ☐ Broken ☐ Cracked ☐ Need PaintLid Condition: ☒ Good ☐ Broken ☐ CrackedHinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted☐ FLUSH MOUNTED NAWell cover present? ☐ Yes ☐ NoCondition: ☐ Good ☐ Broken ☐ CrackedCondition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ NoPad 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 ☐ NoWell lock present? ☒ Yes ☐ NoLock functioning properly? ☒ Yes ☐ NoAre bollards present and stable? ☒ Yes ☐ NoWell ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ NoVisual obstruction? ☐ Yes ☒ NoIs well open to completed depth? (complete when gauging) ☒ Yes ☐ NoIs silt present in well? (complete when gauging) ☐ Yes ☒ NoIs silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: Longhorn Well ID: 12W002
 Job No.: _____ Inspection Date: 3/27/18
 Client: ARMY Well Completion Depth/ Measured Depth: 28.5/29.41
 Site Name: LHAP-12 Inspector: NIKE MARTINEZ

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
 Protective casing? ☒ Yes ☐ No
 Material: Steel
 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:

WELL INSPECTION FORM

Job Name: LONGHORNWell ID: 12WW05

Job No.: _____

Inspection Date: 3/27/18Client: ARMYWell Completion Depth/ Measured Depth: 38/36.40Site Name: LHAAP-12Inspector: MIKE MARTINEZ☒ ABOVE GROUND

Well Accessible?

☒ Yes ☐ No

Protective casing?

☒ Yes ☐ No

Material

Steel

Condition:

☒ Good☐ Broken☐ Cracked☐ Need Paint

Lid Condition:

☒ Good☐ Broken☐ Cracked

Hinge Condition:

☒ Good☐ Less than 50% rusted☐ More than 50% rusted☐ FLUSH MOUNTEDNA

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:

WELL INSPECTION FORM

Job Name: LonghornWell ID: 12WW 20

Job No.: _____

Inspection Date: 3/27/2018Client: ARMYWell Completion Depth/ Measured Depth: 38.85/37.19Site Name: LHAMP-12Inspector: MIKE MARTINEZ☒ ABOVE GROUNDWell Accessible? ☒ Yes ☐ NoProtective casing? ☒ Yes ☐ NoMaterial: SteelCondition: ☒ Good ☐ Broken ☐ Cracked ☐ Need PaintLid Condition: ☒ Good ☐ Broken ☐ CrackedHinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted☒ FLUSH MOUNTEDNAWell cover present? ☐ Yes ☐ NoCondition: ☒ Good ☐ Broken ☐ CrackedCondition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ NoPad 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 ☐ NoWell lock present? ☒ Yes ☐ NoLock functioning properly? ☒ Yes ☐ NoAre bollards present and stable? ☒ Yes ☐ NoWell ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ NoVisual obstruction? ☐ Yes ☒ NoIs well open to completed depth? (complete when gauging) ☒ Yes ☐ NoIs silt present in well? (complete when gauging) ☐ Yes ☒ NoIs silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

WELL INSPECTION FORM

Job Name: LonghornWell ID: 12WW21

Job No.: _____

Inspection Date: 3/27/2018Client: ARMYWell Completion Depth/ Measured Depth: 41.7 / 39.73Site Name: LHARP-12Inspector: MIKE MARTINEZ☒ ABOVE GROUND

Well Accessible?

☒ Yes ☐ No

Protective casing?

☒ Yes ☐ No

Material

Steel

Condition:

☒ Good☐ Broken☐ Cracked☐ Need Paint

Lid Condition:

☒ Good☐ Broken☒ Cracked

Hinge Condition:

☒ Good☐ Less than 50% rusted☐ More than 50% rusted☐ FLUSH MOUNTEDNA

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:

WELL INSPECTION FORM

Job Name: LHAAP Well ID: 12W022
 Job No.: _____ Inspection Date: 3/27/2018
 Client: ARMY Well Completion Depth/ Measured Depth: 38.36 / 36.24
 Site Name: LHAAP-12 Inspector: MIKE MARTINEZ

☒ ABOVE GROUND

Well Accessible? ☒ Yes ☐ No
 Protective casing? ☒ Yes ☐ No
 Material: Steel
 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:

WELL INSPECTION FORM

Job Name: Longhorn Well ID: 12W023
 Job No.: _____ Inspection Date: 3/27/18
 Client: ARMY Well Completion Depth/ Measured Depth: 25.14/23.27
 Site Name: ~~Longhorn~~ LHAAP-12 Inspector: MIKE MARTINEZ

☒ ABOVE GROUND

Well Accessible?

☒ Yes ☐ No

Protective casing?

☒ Yes ☐ No

Material

Steel

Condition:

☒ Good☐ Broken☐ Cracked☐ Need Paint

Lid Condition:

☒ Good☐ Broken☒ Cracked

Hinge Condition:

☒ Good☐ Less than 50% rusted☐ More than 50% rusted☐ FLUSH MOUNTEDNA

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:

WELL INSPECTION FORM

Job Name: LonghornWell ID: 12WW24

Job No.: _____

Inspection Date: 3/27/18Client: ARMYWell Completion Depth/ Measured Depth: 26/25.89Site Name: HAAP-12Inspector: MIKE MARTINEZ☒ ABOVE GROUNDWell Accessible? ☒ Yes ☐ NoProtective casing? ☒ Yes ☐ NoMaterial SteelCondition: ☒ Good ☐ Broken ☐ Cracked ☐ Need PaintLid Condition: ☒ Good ☐ Broken ☐ CrackedHinge Condition: ☒ Good ☐ Less than 50% rusted ☐ More than 50% rusted☐ FLUSH MOUNTED NAWell cover present? ☐ Yes ☐ NoCondition: ☐ Good ☐ Broken ☐ CrackedCondition of Sump: ☐ Clean ☐ Dry ☐ Standing Water

CONCRETE PAD:

Sloped away from casing? ☒ Yes ☐ NoPad 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 ☐ NoWell lock present? ☒ Yes ☐ NoLock functioning properly? ☒ Yes ☐ NoAre bollards present and stable? ☒ Yes ☐ NoWell ID visible? ☒ Yes ☐ No

WELL INTEGRITY:

Bailer present? ☐ Yes ☒ NoVisual obstruction? ☐ Yes ☒ NoIs well open to completed depth? (complete when gauging) ☒ Yes ☐ NoIs silt present in well? (complete when gauging) ☐ Yes ☒ NoIs silt greater than 10% of well screen length? (complete when gauging) ☐ Yes ☒ No

COMMENTS:

2017 Summary of Monitoring Well Inspection and Repair

Well Information		Visual Inspections of Well												Comments
Well Identification	Date	ID Plate	Lock	Gasket	Cap	Bolts	Bollards	Pad	Vegetation	Tampering/ Obstructions	Limited Access	New Wells	Subsurface Activities	
12WW01	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW02	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW05	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW20	12/4/2017	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW21	5/31/2016	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW22	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW23	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
12WW24	12/4/2017	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	
	3/27/2018	X	X	X	X	X	Present/Functioning	Good	None - Well is Clear	N	N	N	N	

Notes:

ID - identification
N - none

Well Construction Information

Well Identification	Log Date	Depth to Water (ft btoc)	Total Measured Well Depth (ft btoc)	Total Measured Well Depth (ft bgs)	Dry?	Water Column (ft)	Survey Data		Well Construction Data				Percent Siltation
							Top of Casing Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Constructed Well Depth (ft bgs)	Well Screen Beginning Depth (ft bgs)	Well Screen Ending Depth (ft bgs)	Screen Length (ft)	
12WW01	3/27/2018	23.55	29.95	27.33	No	2.95	204.19	201.57	26.5	14.50	26.50	12.00	0.0%
12WW02	3/27/2018	21.82	31.60	29.41	No	6.68	202.45	200.26	28.5	13.50	28.50	15.00	0.0%
12WW05	3/27/2018	8.05	38.55	36.40	No	29.95	190.52	188.37	38	15.50	35.50	20.00	0.0%
12WW20	12/4/2017	18.80	39.26	37.19	No	20.05	199.15	197.08	38.85	28.85	38.85	10.00	4.3%
	3/27/2018	17.60	39.18	37.11	No	21.25	199.15	197.08	38.85	28.85	38.85	10.00	4.5%
12WW21	12/4/2017	21.92	41.83	39.86	No	19.78	202.07	200.10	41.7	31.70	41.70	10.00	4.4%
	3/27/2018	21.42	41.70	39.73	No	20.28	202.07	200.10	41.7	31.70	41.70	10.00	4.7%
12WW22	3/27/2018	7.81	38.66	36.24	No	30.55	190.20	187.78	38.36	28.36	38.36	10.00	5.5%
12WW23	3/27/2018	16.88	25.37	23.27	No	8.26	196.97	194.87	25.14	15.14	25.14	10.00	7.4%
12WW24	12/4/2017	22.61	28.25	25.95	No	3.39	203.17	200.87	26	15.50	25.50	10.00	0.0%
	3/27/2018	22.35	28.19	25.89	No	3.65	203.17	200.87	26	15.50	25.50	10.00	0.0%

Notes:
ft - feet
ft amsl - feet above mean sea level
ft bgs - feet below ground surface
ft btoc - feet below top of casing

Appendix B

Land Use Controls and Maintenance Log

LUC Inspection and Maintenance Log - LHAAP 12

Date	Inspected By	Inspection / Maintenance Activities (yearly, at a minimum)					Corrective Action or Repairs Required?	Repairs / Action Taken
		Protect Landfill Integrity				Prevent Human Exposure to Groundwater		
		Vegetative Cover Maintained (i.e., grass mowed at least annually)	Fence and Signage Maintained	Observance of Landfill Cover Degradation (e.g., desiccation cracks, erosion, or gulying)	Continued Compliance Verified for No Digging or Disturbance of Landfill Cover or Contents	Verified No Withdrawal of Use of Groundwater (other than environmental testing)		
7/26/2017	Beesinger, S.	Maintained. Vegetative cover is in good condition.	Fence and signage in good repair.	Cover subsidence observed and found to be in good condition. No erosion, cracks, degradation or gulying was found.	No evidence of animal burrowing in the cap.	Completed and verified.	None	None

Notes:
e.g. - for example
i.e. - that is
LUC - land use control

Appendix C

Groundwater Sampling Forms



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **12WW20**Project No: **501032**Sampler(s): **Scott Beesinger**

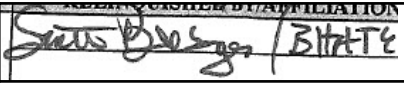
FIELD CONDITIONS

Mostly Cloudy

SAMPLING INFORMATION

Sample No: **12WW20-120417**DATE/TIME: **12/4/2017 / 10:05**Sample Interval:
18.87 - 19.02 FtSampling Method: **BP**Sample Purpose: **REG**Sample Matrix: **GW**Sample Notes: **12WW20-120417_MS/MSD**

Chain of Custody	COC Notes	Analysis Group	Analytic Method
12-NOV2017-GW-ALSHT	None	SEMIVOLATILES	SW8270SIM
		VOLATILES	SW8260B

Sampler:		Scott Beesinger
QC'ed By:		Sowmya Suryanarayanan
		8/24/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Bladder PumpCasing ID (in.): 4Purge Start Date/Time: 12/4/2017 / 09:35Depth to Water - Initial (DTWi) (ft) 18.8Purge End Date/Time: 12/4/2017 / 10:05Constructed Depth to Well Bottom (ft) 38.85PID Reading: N/AMeasured Depth of Well (ft): 39.26Screen Interval (ft): 28.85 - 38.85Pump Start Time: 12/4/2017 / 09:35



Sample Collection Log

2 of 2

Location ID: 12WW20					Sample No: 12WW20-120417					
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
12/4/2017	09:35	100	0.13	18.87	1.39	20.56	5.42	4.5	250	1.01
12/4/2017	09:40	100	0.26	18.94	1.31	20.65	5.25	2.7	300	0.54
12/4/2017	09:45	100	0.39	18.98	1.31	20.69	5.24	2.3	304	0.48
12/4/2017	09:50	100	0.52	19.01	1.31	20.87	5.15	2.1	329	0.45
12/4/2017	09:55	100	0.65	19.02	1.31	20.91	5.15	2.5	330	0.44
12/4/2017	10:00	100	0.78	19.02	1.30	20.95	5.14	2.6	330	0.44
12/4/2017	10:05	100	0.91	19.02	1.30	20.99	5.13	2.7	331	0.43



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **12WW21**Project No: **501032**Sampler(s): **Scott Beesinger**

FIELD CONDITIONS

Mostly Cloudy. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **12WW21-120417**DATE/TIME: **12/4/2017 / 09:00**Sample Interval:
21.99 - 22.16 FtSampling Method: **BP**Sample Purpose: **REG**Sample Matrix: **GW**Sample Notes: **12WW21-120417_FD**

Chain of Custody	COC Notes	Analysis Group	Analytic Method
12-NOV2017-GW-ALSHT	None	SEMIVOLATILES	SW8270SIM
		VOLATILES	SW8260B

Sampler:		Scott Beesinger
QC'ed By:		Sowmya Suryanarayanan
		8/24/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Bladder PumpCasing ID (in.): 4Purge Start Date/Time: 12/4/2017 / 08:30Depth to Water - Initial (DTWi) (ft) 21.92Purge End Date/Time: 12/4/2017 / 09:00Constructed Depth to Well Bottom (ft) 41.7PID Reading: N/AMeasured Depth of Well (ft): 41.83Screen Interval (ft): 31.70 - 41.70Pump Start Time: 12/4/2017 / 08:30



Sample Collection Log

2 of 2

Location ID: 12WW21 Sample No: 12WW21-120417										
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
12/4/2017	08:30	100	0.13	21.99	5.22	19.50	5.63	12.0	156	1.38
12/4/2017	08:35	100	0.26	22.05	5.24	19.54	5.51	9.9	175	0.46
12/4/2017	08:40	100	0.39	22.10	5.23	19.60	5.34	10.4	195	0.29
12/4/2017	08:45	100	0.52	22.13	5.23	19.61	5.18	10.6	205	0.15
12/4/2017	08:50	100	0.65	22.15	5.23	19.63	5.17	10.9	206	0.15
12/4/2017	08:55	100	0.78	22.16	5.23	19.65	5.16	10.3	207	0.14
12/4/2017	09:00	100	0.91	22.16	5.23	19.66	5.16	10.8	208	0.14



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **12WW24**Project No: **501032**Sampler(s): **Scott Beesinger**

FIELD CONDITIONS

Mostly Cloudy. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **12WW24-120417**DATE/TIME: **12/4/2017 / 10:35**Sample Interval:
22.61 - 22.75 FtSampling Method: **BA**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: Bailing well. Well went dry.

Chain of Custody	COC Notes	Analysis Group	Analytic Method
12-NOV2017-GW-ALSHT	None	SEMIVOLATILES	SW8270SIM
		VOLATILES	SW8260B

Sampler:	<u>Scott Beesinger / BITE</u>	Scott Beesinger
QC'ed By:	<u>Sowmya</u>	Sowmya Suryanarayanan
		8/24/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: BailerCasing ID (in.): 4Purge Start Date/Time: 12/4/2017 / 08:07Depth to Water - Initial (DTWi) (ft) 22.61Purge End Date/Time: 12/4/2017 / 10:35Constructed Depth to Well Bottom (ft) 26PID Reading: N/AMeasured Depth of Well (ft): 28.25Screen Interval (ft): 15.50 - 25.50Pump Start Time: 12/4/2017 / 08:07

Location ID: 12WW24					Sample No: 12WW24-120417					
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
12/4/2017	08:07			22.61						
12/4/2017	08:15			28.19						
12/4/2017	10:35	100		22.75	1.60	20.96	5.43	21.9	125	7.81

Appendix D

Laboratory Analytical Data Package



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December 14, 2017

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS17120283**

Laboratory Results for: **LHAAP-12 501032**

Dear Jennifer,

ALS Environmental received 5 sample(s) on Dec 05, 2017 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: Dayna.Fisher
Sonia West
Project Manager

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
Work Order: HS17120283

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS17120283-01	12WW21-120417	Groundwater		04-Dec-2017 09:00	05-Dec-2017 09:45	☐
HS17120283-02	12WW21-120417-FD	Groundwater		04-Dec-2017 09:00	05-Dec-2017 09:45	☐
HS17120283-03	12WW20-120417	Groundwater		04-Dec-2017 10:05	05-Dec-2017 09:45	☐
HS17120283-04	12WW24-120417	Groundwater		04-Dec-2017 10:35	05-Dec-2017 09:45	☐
HS17120283-05	Trip Blank	Water	ALS-110717-43	04-Dec-2017 00:01	05-Dec-2017 09:45	☐

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
Work Order: HS17120283

CASE NARRATIVE

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 123073****Sample ID: 12WW20-120417 (HS17120283-03)**

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

Sample ID: 12WW20-120417 (HS17120283-03MSD)

- One or more of the matrix spike duplicate compounds for the EPA 8270 analysis were recovered outside of the quality control limits due to sample matrix interferences.

Sample ID: 12WW20-120417 (HS17120283-03MS/MSD)

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

Sample ID: 12WW21-120417 (HS17120283-01)

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

Sample ID: 12WW21-120417-FD (HS17120283-02)

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

Sample ID: 12WW24-120417 (HS17120283-04)

- The GCMS semi-volatile extract of this sample was run at a dilution due to a high level of matrix interference.

Sample ID: LCS-123073

- High %R for surrogate 2-Fluorobiphenyl, it is not associated with target compound.

GCMS Volatiles by Method SW8260**Batch ID: R306920****Sample ID: 12WW20-120417 (HS17120283-03MS)**

- MS and/or MSD recovered outside of control limits

Sample ID: 12WW20-120417 (HS17120283-03MSD)

- MS/MSD RPD recovered outside control limits
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ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW21-120417
 Collection Date: 04-Dec-2017 09:00

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 13:56
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 13:56
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	10-Dec-2017 13:56
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	10-Dec-2017 13:56
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Dec-2017 13:56
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW21-120417
 Collection Date: 04-Dec-2017 09:00

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 13:56
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 13:56
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:56
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:56
Surr: 1,2-Dichloroethane-d4	94.8			0	70-126	%REC	1	10-Dec-2017 13:56
Surr: 4-Bromofluorobenzene	103			0	81-113	%REC	1	10-Dec-2017 13:56
Surr: Dibromofluoromethane	96.2			0	77-123	%REC	1	10-Dec-2017 13:56
Surr: Toluene-d8	104			0	82-127	%REC	1	10-Dec-2017 13:56
SEMIVOLATILES SIM			Method:SW8270SIM				Prep:SW3510 / 08-Dec-2017 Analyst: ACN	
1,4-Dioxane	1.6		0.10	0.10	0.10	ug/L	10	13-Dec-2017 12:50
Surr: 2-Fluorobiphenyl	123			0	40-140	%REC	10	13-Dec-2017 12:50
Surr: 4-Terphenyl-d14	133			0	40-140	%REC	10	13-Dec-2017 12:50
Surr: Nitrobenzene-d5	46.3			0	40-140	%REC	10	13-Dec-2017 12:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW21-120417-FD
 Collection Date: 04-Dec-2017 09:00

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 14:21
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 14:21
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	10-Dec-2017 14:21
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	10-Dec-2017 14:21
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Dec-2017 14:21
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW21-120417-FD
 Collection Date: 04-Dec-2017 09:00

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 14:21
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 14:21
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:21
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:21
Surr: 1,2-Dichloroethane-d4	91.7			0	70-126	%REC	1	10-Dec-2017 14:21
Surr: 4-Bromofluorobenzene	103			0	81-113	%REC	1	10-Dec-2017 14:21
Surr: Dibromofluoromethane	95.3			0	77-123	%REC	1	10-Dec-2017 14:21
Surr: Toluene-d8	106			0	82-127	%REC	1	10-Dec-2017 14:21
SEMIVOLATILES SIM			Method:SW8270SIM				Prep:SW3510 / 08-Dec-2017 Analyst: ACN	
1,4-Dioxane	1.1		0.10	0.10	0.10	ug/L	10	13-Dec-2017 13:11
Surr: 2-Fluorobiphenyl	116			0	40-140	%REC	10	13-Dec-2017 13:11
Surr: 4-Terphenyl-d14	97.8			0	40-140	%REC	10	13-Dec-2017 13:11
Surr: Nitrobenzene-d5	52.1			0	40-140	%REC	10	13-Dec-2017 13:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW20-120417
 Collection Date: 04-Dec-2017 10:05

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 13:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 13:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	10-Dec-2017 13:31
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	10-Dec-2017 13:31
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Dec-2017 13:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW20-120417
 Collection Date: 04-Dec-2017 10:05

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 13:31
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 13:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:31
Surr: 1,2-Dichloroethane-d4	93.2			0	70-126	%REC	1	10-Dec-2017 13:31
Surr: 4-Bromofluorobenzene	100			0	81-113	%REC	1	10-Dec-2017 13:31
Surr: Dibromofluoromethane	97.5			0	77-123	%REC	1	10-Dec-2017 13:31
Surr: Toluene-d8	102			0	82-127	%REC	1	10-Dec-2017 13:31
SEMIVOLATILES SIM			Method:SW8270SIM				Prep:SW3510 / 08-Dec-2017 Analyst: ACN	
1,4-Dioxane	1.7		0.10	0.10	0.10	ug/L	10	13-Dec-2017 13:32
Surr: 2-Fluorobiphenyl	135			0	40-140	%REC	10	13-Dec-2017 13:32
Surr: 4-Terphenyl-d14	131			0	40-140	%REC	10	13-Dec-2017 13:32
Surr: Nitrobenzene-d5	55.4			0	40-140	%REC	10	13-Dec-2017 13:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW24-120417
 Collection Date: 04-Dec-2017 10:35

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1-Dichloroethene	0.58	J	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 14:45
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 14:45
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	10-Dec-2017 14:45
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	10-Dec-2017 14:45
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Dec-2017 14:45
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Chlorobenzene	2.1		0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: 12WW24-120417
 Collection Date: 04-Dec-2017 10:35

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
cis-1,2-Dichloroethene	26		0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 14:45
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 14:45
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 14:45
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Trichloroethene	83		0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 14:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 14:45
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.0</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>10-Dec-2017 14:45</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>10-Dec-2017 14:45</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.0</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>10-Dec-2017 14:45</i>
<i>Surr: Toluene-d8</i>	<i>104</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>10-Dec-2017 14:45</i>
SEMIVOLATILES SIM			Method:SW8270SIM				Prep:SW3510 / 08-Dec-2017	Analyst: ACN
1,4-Dioxane	4.8		0.10	0.10	0.10	ug/L	10	13-Dec-2017 14:34
<i>Surr: 2-Fluorobiphenyl</i>	<i>102</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>13-Dec-2017 14:34</i>
<i>Surr: 4-Terphenyl-d14</i>	<i>95.4</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>13-Dec-2017 14:34</i>
<i>Surr: Nitrobenzene-d5</i>	<i>46.7</i>			0	<i>40-140</i>	%REC	<i>10</i>	<i>13-Dec-2017 14:34</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: Trip Blank
 Collection Date: 04-Dec-2017 00:01

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-05
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 13:07
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 13:07
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	10-Dec-2017 13:07
Acetone	2.3		2.0	1.0	2.0	ug/L	1	10-Dec-2017 13:07
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	10-Dec-2017 13:07
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: LHAAP-12 501032
 Sample ID: Trip Blank
 Collection Date: 04-Dec-2017 00:01

ANALYTICAL REPORT

WorkOrder:HS17120283
 Lab ID:HS17120283-05
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	10-Dec-2017 13:07
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	10-Dec-2017 13:07
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	10-Dec-2017 13:07
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	10-Dec-2017 13:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	10-Dec-2017 13:07
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.6</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2017 13:07</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2017 13:07</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.8</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2017 13:07</i>
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>10-Dec-2017 13:07</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

Batch ID: 123073 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS17120283-01	1	1000	1 (mL)	0.001
HS17120283-02	1	1000	1 (mL)	0.001
HS17120283-03	1	1000	1 (mL)	0.001
HS17120283-04	1	1000	1 (mL)	0.001

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 123073 Test Name : SEMIVOLATILES SIM Matrix: Groundwater						
HS17120283-01	12WW21-120417	04 Dec 2017 09:00		08 Dec 2017 10:10	13 Dec 2017 12:50	10
HS17120283-02	12WW21-120417-FD	04 Dec 2017 09:00		08 Dec 2017 10:10	13 Dec 2017 13:11	10
HS17120283-03	12WW20-120417	04 Dec 2017 10:05		08 Dec 2017 10:10	13 Dec 2017 13:32	10
HS17120283-04	12WW24-120417	04 Dec 2017 10:35		08 Dec 2017 10:10	13 Dec 2017 14:34	10
Batch ID R306920 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water						
HS17120283-05	Trip Blank	04 Dec 2017 00:01			10 Dec 2017 13:07	1
Batch ID R306920 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater						
HS17120283-01	12WW21-120417	04 Dec 2017 09:00			10 Dec 2017 13:56	1
HS17120283-02	12WW21-120417-FD	04 Dec 2017 09:00			10 Dec 2017 14:21	1
HS17120283-03	12WW20-120417	04 Dec 2017 10:05			10 Dec 2017 13:31	1
HS17120283-04	12WW24-120417	04 Dec 2017 10:35			10 Dec 2017 14:45	1

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: 123073		Instrument: SV-5		Method: SW8270SIM					
MBLK	Sample ID: MBLK-123073	Units: ug/L		Analysis Date: 13-Dec-2017 11:45					
Client ID:	Run ID: SV-5_307176	SeqNo: 4350084		PrepDate: 08-Dec-2017		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,4-Dioxane	0.010	0.010							U
Surr: 2-Fluorobiphenyl	0.1025	0	0.08	0	128	40 - 140			
Surr: 4-Terphenyl-d14	0.08573	0	0.08	0	107	40 - 140			
Surr: Nitrobenzene-d5	0.04778	0	0.08	0	59.7	40 - 140			
LCS	Sample ID: LCS-123073	Units: ug/L		Analysis Date: 13-Dec-2017 12:05					
Client ID:	Run ID: SV-5_307176	SeqNo: 4350085		PrepDate: 08-Dec-2017		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,4-Dioxane	0.08463	0.010	0.08	0	106	40 - 140			
Surr: 2-Fluorobiphenyl	0.1149	0	0.08	0	144	40 - 140			S
Surr: 4-Terphenyl-d14	0.104	0	0.08	0	130	40 - 140			
Surr: Nitrobenzene-d5	0.05427	0	0.08	0	67.8	40 - 140			
MS	Sample ID: HS17120283-03MS	Units: ug/L		Analysis Date: 13-Dec-2017 13:53					
Client ID: 12WW20-120417	Run ID: SV-5_307176	SeqNo: 4350089		PrepDate: 08-Dec-2017		DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,4-Dioxane	1.763	0.10	0.08081	1.721	51.6	40 - 140			O
Surr: 2-Fluorobiphenyl	0.1099	0	0.08081	0	136	40 - 140			
Surr: 4-Terphenyl-d14	0.1021	0	0.08081	0	126	40 - 140			
Surr: Nitrobenzene-d5	0.03594	0	0.08081	0	44.5	40 - 140			
MSD	Sample ID: HS17120283-03MSD	Units: ug/L		Analysis Date: 13-Dec-2017 14:13					
Client ID: 12WW20-120417	Run ID: SV-5_307176	SeqNo: 4350090		PrepDate: 08-Dec-2017		DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,4-Dioxane	1.649	0.10	0.08	1.721	-90.0	40 - 140	1.763	6.66	20 SO
Surr: 2-Fluorobiphenyl	0.095	0	0.08	0	119	40 - 140	0.1099	14.5	20
Surr: 4-Terphenyl-d14	0.08896	0	0.08	0	111	40 - 140	0.1021	13.7	20
Surr: Nitrobenzene-d5	0.03591	0	0.08	0	44.9	40 - 140	0.03594	0.0818	20
The following samples were analyzed in this batch:									
HS17120283-01		HS17120283-02		HS17120283-03		HS17120283-04			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260						
MBLK	Sample ID: VBLKW-171210	Units: ug/L			Analysis Date: 10-Dec-2017 12:42					
Client ID:	Run ID: VOA6_306920	SeqNo: 4344284		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	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	10	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

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Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260					
MBLK	Sample ID: VBLKW-171210	Units: ug/L		Analysis Date: 10-Dec-2017 12:42					
Client ID:	Run ID: VOA6_306920	SeqNo: 4344284		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	1.0	2.0							U
Naphthalene	0.50	1.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	46.53	1.0	50	0	93.1	70 - 123			
Surr: 4-Bromofluorobenzene	50.84	1.0	50	0	102	82 - 115			
Surr: Dibromofluoromethane	48.81	1.0	50	0	97.6	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920											Instrument: VOA6			Method: SW8260		
MBLK		Sample ID: VBLKW-171210			Units: ug/L			Analysis Date: 10-Dec-2017 12:42								
Client ID:		Run ID: VOA6_306920			SeqNo: 4344284		PrepDate:		DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8		51	1.0	50	0	102	81 - 120									

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260						
LCS		Sample ID: VLCSW-171210		Units: ug/L		Analysis Date: 10-Dec-2017 11:28				
Client ID:		Run ID: VOA6_306920		SeqNo: 4344283		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	46.72	1.0	50	0	93.4	77 - 118				
1,1,1-Trichloroethane	47.97	1.0	50	0	95.9	70 - 130				
1,1,2,2-Tetrachloroethane	46.74	1.0	50	0	93.5	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	46.4	1.0	50	0	92.8	70 - 130				
1,1,2-Trichloroethane	46.78	1.0	50	0	93.6	77 - 113				
1,1-Dichloroethane	45.75	1.0	50	0	91.5	71 - 122				
1,1-Dichloroethene	45.8	1.0	50	0	91.6	70 - 130				
1,1-Dichloropropene	49.82	1.0	50	0	99.6	78 - 118				
1,2,3-Trichlorobenzene	41.55	1.0	50	0	83.1	70 - 130				
1,2,3-Trichloropropane	43.5	1.0	50	0	87.0	70 - 127				
1,2,4-Trichlorobenzene	44.4	1.0	50	0	88.8	77 - 126				
1,2,4-Trimethylbenzene	49.01	1.0	50	0	98.0	73 - 121				
1,2-Dibromo-3-chloropropane	41.81	1.0	50	0	83.6	70 - 130				
1,2-Dibromoethane	47.71	1.0	50	0	95.4	76 - 123				
1,2-Dichlorobenzene	45.11	1.0	50	0	90.2	77 - 113				
1,2-Dichloroethane	44.76	1.0	50	0	89.5	70 - 124				
1,2-Dichloropropane	47.49	1.0	50	0	95.0	72 - 119				
1,3,5-Trimethylbenzene	48.83	1.0	50	0	97.7	75 - 118				
1,3-Dichlorobenzene	44.32	1.0	50	0	88.6	78 - 118				
1,3-Dichloropropane	44.42	1.0	50	0	88.8	75 - 116				
1,4-Dichlorobenzene	49.43	1.0	50	0	98.9	79 - 113				
2,2-Dichloropropane	44.96	1.0	50	0	89.9	70 - 130				
2-Butanone	98.34	2.0	100	0	98.3	70 - 130				
2-Chlorotoluene	48.89	1.0	50	0	97.8	70 - 128				
2-Hexanone	94.62	2.0	100	0	94.6	70 - 130				
4-Chlorotoluene	49.1	1.0	50	0	98.2	74 - 126				
4-Isopropyltoluene	43.82	1.0	50	0	87.6	74 - 126				
4-Methyl-2-pentanone	88.93	2.0	100	0	88.9	70 - 130				
Acetone	91.99	2.0	100	0	92.0	70 - 130				
Benzene	48.97	1.0	50	0	97.9	74 - 120				
Bromobenzene	46.22	1.0	50	0	92.4	78 - 113				
Bromochloromethane	53.48	1.0	50	0	107	76 - 124				
Bromodichloromethane	48.06	1.0	50	0	96.1	74 - 122				
Bromoform	47.97	1.0	50	0	95.9	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260						
LCS		Sample ID: VLCSW-171210		Units: ug/L		Analysis Date: 10-Dec-2017 11:28				
Client ID:		Run ID: VOA6_306920		SeqNo: 4344283		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	45.06	1.0	50	0	90.1	70 - 130				
Carbon disulfide	94.36	2.0	100	0	94.4	70 - 130				
Carbon tetrachloride	50.41	1.0	50	0	101	71 - 125				
Chlorobenzene	46.86	1.0	50	0	93.7	76 - 113				
Chloroethane	43.71	1.0	50	0	87.4	70 - 130				
Chloroform	45.76	1.0	50	0	91.5	71 - 121				
Chloromethane	47.16	1.0	50	0	94.3	70 - 129				
cis-1,2-Dichloroethene	46.57	1.0	50	0	93.1	75 - 122				
cis-1,3-Dichloropropene	48.99	1.0	50	0	98.0	73 - 127				
Dibromochloromethane	46.52	1.0	50	0	93.0	77 - 122				
Dibromomethane	46.81	1.0	50	0	93.6	78 - 121				
Dichlorodifluoromethane	49.09	1.0	50	0	98.2	70 - 130				
Ethylbenzene	47.4	1.0	50	0	94.8	77 - 117				
Hexachlorobutadiene	48.26	1.0	50	0	96.5	70 - 130				
Isopropylbenzene	47.88	1.0	50	0	95.8	73 - 127				
m,p-Xylene	93.96	2.0	100	0	94.0	77 - 122				
Methylene chloride	48.88	2.0	50	0	97.8	70 - 127				
Naphthalene	44.36	1.0	50	0	88.7	70 - 130				
n-Butylbenzene	44.55	1.0	50	0	89.1	72 - 130				
n-Propylbenzene	48.49	1.0	50	0	97.0	73 - 124				
o-Xylene	47.79	1.0	50	0	95.6	75 - 119				
sec-Butylbenzene	43.38	1.0	50	0	86.8	73 - 128				
Styrene	48.95	1.0	50	0	97.9	72 - 126				
tert-Butylbenzene	48.26	1.0	50	0	96.5	73 - 124				
Tetrachloroethene	50.41	1.0	50	0	101	76 - 119				
Toluene	47.16	1.0	50	0	94.3	77 - 118				
trans-1,2-Dichloroethene	48.94	1.0	50	0	97.9	72 - 127				
trans-1,3-Dichloropropene	47.47	1.0	50	0	94.9	77 - 119				
Trichloroethene	50.9	1.0	50	0	102	77 - 121				
Trichlorofluoromethane	46.06	1.0	50	0	92.1	70 - 130				
Vinyl chloride	44.3	1.0	50	0	88.6	70 - 130				
Surr: 1,2-Dichloroethane-d4	44.46	1.0	50	0	88.9	70 - 130				
Surr: 4-Bromofluorobenzene	51.77	1.0	50	0	104	82 - 115				
Surr: Dibromofluoromethane	47.9	1.0	50	0	95.8	73 - 126				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260						
LCS	Sample ID: VLCSW-171210	Units: ug/L			Analysis Date: 10-Dec-2017 11:28					
Client ID:	Run ID: VOA6_306920	SeqNo: 4344283		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Surr: Toluene-d8	52.59	1.0	50	0	105	81 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260					
MS		Sample ID: HS17120283-03MS		Units: ug/L		Analysis Date: 10-Dec-2017 16:00			
Client ID: 12WW20-120417		Run ID: VOA6_306920		SeqNo: 4344290		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	44.75	1.0	50	0	89.5	70 - 120			
1,1,1-Trichloroethane	41.49	1.0	50	0	83.0	70 - 130			
1,1,2,2-Tetrachloroethane	44.98	1.0	50	0	90.0	70 - 123			
1,1,2-Trichlor-1,2,2-trifluoroethane	37.93	1.0	50	0	75.9	70 - 130			
1,1,2-Trichloroethane	44.54	1.0	50	0	89.1	70 - 117			
1,1-Dichloroethane	41.93	1.0	50	0	83.9	70 - 127			
1,1-Dichloroethene	38.75	1.0	50	0	77.5	70 - 130			
1,1-Dichloropropene	42.2	1.0	50	0	84.4	70 - 129			
1,2,3-Trichlorobenzene	36.39	1.0	50	0	72.8	70 - 130			
1,2,3-Trichloropropane	41.1	1.0	50	0	82.2	70 - 130			
1,2,4-Trichlorobenzene	38.69	1.0	50	0	77.4	70 - 125			
1,2,4-Trimethylbenzene	44.36	1.0	50	0	88.7	70 - 125			
1,2-Dibromo-3-chloropropane	39.8	1.0	50	0	79.6	70 - 130			
1,2-Dibromoethane	45.82	1.0	50	0	91.6	70 - 124			
1,2-Dichlorobenzene	42.05	1.0	50	0	84.1	70 - 115			
1,2-Dichloroethane	42.25	1.0	50	0	84.5	70 - 127			
1,2-Dichloropropane	44.98	1.0	50	0	90.0	70 - 122			
1,3,5-Trimethylbenzene	43.92	1.0	50	0	87.8	70 - 126			
1,3-Dichlorobenzene	41.06	1.0	50	0	82.1	70 - 119			
1,3-Dichloropropane	43.26	1.0	50	0	86.5	70 - 121			
1,4-Dichlorobenzene	45.73	1.0	50	0	91.5	70 - 114			
2,2-Dichloropropane	38.95	1.0	50	0	77.9	70 - 130			
2-Butanone	87.61	2.0	100	0	87.6	70 - 130			
2-Chlorotoluene	45.84	1.0	50	0	91.7	70 - 130			
2-Hexanone	92.32	2.0	100	0	92.3	70 - 130			
4-Chlorotoluene	44.69	1.0	50	0	89.4	70 - 130			
4-Isopropyltoluene	38.14	1.0	50	0	76.3	70 - 130			
4-Methyl-2-pentanone	83.01	2.0	100	0	83.0	70 - 130			
Acetone	79.83	2.0	100	0	79.8	70 - 130			
Benzene	44.75	1.0	50	0	89.5	70 - 127			
Bromobenzene	44.69	1.0	50	0	89.4	70 - 115			
Bromochloromethane	49.85	1.0	50	0	99.7	70 - 127			
Bromodichloromethane	45.78	1.0	50	0	91.6	70 - 124			
Bromoform	45.49	1.0	50	0	91.0	70 - 129			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260					
MS		Sample ID: HS17120283-03MS		Units: ug/L		Analysis Date: 10-Dec-2017 16:00			
Client ID: 12WW20-120417		Run ID: VOA6_306920		SeqNo: 4344290		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	38.92	1.0	50	0	77.8	70 - 130			
Carbon disulfide	80.62	2.0	100	0	80.6	70 - 130			
Carbon tetrachloride	41.75	1.0	50	0	83.5	70 - 130			
Chlorobenzene	44.06	1.0	50	0	88.1	70 - 114			
Chloroethane	38.4	1.0	50	0	76.8	70 - 130			
Chloroform	42.58	1.0	50	0	85.2	70 - 125			
Chloromethane	39.92	1.0	50	0	79.8	70 - 130			
cis-1,2-Dichloroethene	43.74	1.0	50	0	87.5	70 - 128			
cis-1,3-Dichloropropene	45.26	1.0	50	0	90.5	70 - 125			
Dibromochloromethane	44.85	1.0	50	0	89.7	70 - 124			
Dibromomethane	44.1	1.0	50	0	88.2	70 - 124			
Dichlorodifluoromethane	32.45	1.0	50	0	64.9	70 - 130			S
Ethylbenzene	42.77	1.0	50	0	85.5	70 - 124			
Hexachlorobutadiene	37.9	1.0	50	0	75.8	70 - 130			
Isopropylbenzene	42.05	1.0	50	0	84.1	70 - 130			
m,p-Xylene	85.32	2.0	100	0	85.3	70 - 130			
Methylene chloride	45.25	2.0	50	0	90.5	70 - 128			
Naphthalene	38.54	1.0	50	0	77.1	70 - 130			
n-Butylbenzene	37.07	1.0	50	0	74.1	70 - 130			
n-Propylbenzene	42.78	1.0	50	0	85.6	70 - 130			
o-Xylene	43.89	1.0	50	0	87.8	70 - 124			
sec-Butylbenzene	37.44	1.0	50	0	74.9	70 - 130			
Styrene	46.13	1.0	50	0	92.3	70 - 130			
tert-Butylbenzene	42.55	1.0	50	0	85.1	70 - 130			
Tetrachloroethene	47.42	1.0	50	0	94.8	70 - 130			
Toluene	43.85	1.0	50	0	87.7	70 - 123			
trans-1,2-Dichloroethene	42.81	1.0	50	0	85.6	70 - 130			
trans-1,3-Dichloropropene	44.92	1.0	50	0	89.8	70 - 121			
Trichloroethene	46.23	1.0	50	0	92.5	70 - 129			
Trichlorofluoromethane	37.6	1.0	50	0	75.2	70 - 130			
Vinyl chloride	35.68	1.0	50	0	71.4	70 - 130			
Surr: 1,2-Dichloroethane-d4	43.53	1.0	50	0	87.1	70 - 126			
Surr: 4-Bromofluorobenzene	51.68	1.0	50	0	103	81 - 113			
Surr: Dibromofluoromethane	46.89	1.0	50	0	93.8	77 - 123			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920											Instrument: VOA6			Method: SW8260				
MS		Sample ID: HS17120283-03MS				Units: ug/L			Analysis Date: 10-Dec-2017 16:00									
Client ID: 12WW20-120417		Run ID: VOA6_306920			SeqNo: 4344290			PrepDate:		DF: 1								
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual							
Surr: Toluene-d8		52.2	1.0	50	0	104	82 - 127											

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260					
MSD		Sample ID: HS17120283-03MSD		Units: ug/L		Analysis Date: 10-Dec-2017 16:24			
Client ID: 12WW20-120417		Run ID: VOA6_306920		SeqNo: 4344291		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	45.82	1.0	50	0	91.6	70 - 120	44.75	2.38	20
1,1,1-Trichloroethane	43.95	1.0	50	0	87.9	70 - 130	41.49	5.74	20
1,1,2,2-Tetrachloroethane	46.61	1.0	50	0	93.2	70 - 123	44.98	3.57	20
1,1,2-Trichlor-1,2,2-trifluoroethane	41.31	1.0	50	0	82.6	70 - 130	37.93	8.55	20
1,1,2-Trichloroethane	45.65	1.0	50	0	91.3	70 - 117	44.54	2.46	20
1,1-Dichloroethane	43.35	1.0	50	0	86.7	70 - 127	41.93	3.34	20
1,1-Dichloroethene	40.94	1.0	50	0	81.9	70 - 130	38.75	5.52	20
1,1-Dichloropropene	44.63	1.0	50	0	89.3	70 - 129	42.2	5.59	20
1,2,3-Trichlorobenzene	47.67	1.0	50	0	95.3	70 - 130	36.39	26.8	20 R
1,2,3-Trichloropropane	42.41	1.0	50	0	84.8	70 - 130	41.1	3.15	20
1,2,4-Trichlorobenzene	46.75	1.0	50	0	93.5	70 - 125	38.69	18.9	20
1,2,4-Trimethylbenzene	47.12	1.0	50	0	94.2	70 - 125	44.36	6.03	20
1,2-Dibromo-3-chloropropane	44.62	1.0	50	0	89.2	70 - 130	39.8	11.4	20
1,2-Dibromoethane	47.68	1.0	50	0	95.4	70 - 124	45.82	3.99	20
1,2-Dichlorobenzene	44.85	1.0	50	0	89.7	70 - 115	42.05	6.45	20
1,2-Dichloroethane	42.53	1.0	50	0	85.1	70 - 127	42.25	0.661	20
1,2-Dichloropropane	45.29	1.0	50	0	90.6	70 - 122	44.98	0.687	20
1,3,5-Trimethylbenzene	46.14	1.0	50	0	92.3	70 - 126	43.92	4.91	20
1,3-Dichlorobenzene	43.05	1.0	50	0	86.1	70 - 119	41.06	4.72	20
1,3-Dichloropropane	44.02	1.0	50	0	88.0	70 - 121	43.26	1.74	20
1,4-Dichlorobenzene	47.6	1.0	50	0	95.2	70 - 114	45.73	4.02	20
2,2-Dichloropropane	40.25	1.0	50	0	80.5	70 - 130	38.95	3.29	20
2-Butanone	92.14	2.0	100	0	92.1	70 - 130	87.61	5.05	20
2-Chlorotoluene	46.86	1.0	50	0	93.7	70 - 130	45.84	2.2	20
2-Hexanone	96.16	2.0	100	0	96.2	70 - 130	92.32	4.08	20
4-Chlorotoluene	46.78	1.0	50	0	93.6	70 - 130	44.69	4.56	20
4-Isopropyltoluene	41.4	1.0	50	0	82.8	70 - 130	38.14	8.22	20
4-Methyl-2-pentanone	87.6	2.0	100	0	87.6	70 - 130	83.01	5.38	20
Acetone	86.01	2.0	100	0	86.0	70 - 130	79.83	7.45	20
Benzene	46.71	1.0	50	0	93.4	70 - 127	44.75	4.29	20
Bromobenzene	44.68	1.0	50	0	89.4	70 - 115	44.69	0.0132	20
Bromochloromethane	50.35	1.0	50	0	101	70 - 127	49.85	0.994	20
Bromodichloromethane	47.18	1.0	50	0	94.4	70 - 124	45.78	3.02	20
Bromoform	47.73	1.0	50	0	95.5	70 - 129	45.49	4.82	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: LHAAP-12 501032
WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920		Instrument: VOA6		Method: SW8260					
MSD		Sample ID: HS17120283-03MSD		Units: ug/L		Analysis Date: 10-Dec-2017 16:24			
Client ID: 12WW20-120417		Run ID: VOA6_306920		SeqNo: 4344291		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	41.14	1.0	50	0	82.3	70 - 130	38.92	5.55	20
Carbon disulfide	85.18	2.0	100	0	85.2	70 - 130	80.62	5.5	20
Carbon tetrachloride	45.9	1.0	50	0	91.8	70 - 130	41.75	9.48	20
Chlorobenzene	45.16	1.0	50	0	90.3	70 - 114	44.06	2.46	20
Chloroethane	40.75	1.0	50	0	81.5	70 - 130	38.4	5.93	20
Chloroform	44.14	1.0	50	0	88.3	70 - 125	42.58	3.6	20
Chloromethane	40.49	1.0	50	0	81.0	70 - 130	39.92	1.43	20
cis-1,2-Dichloroethene	44.88	1.0	50	0	89.8	70 - 128	43.74	2.57	20
cis-1,3-Dichloropropene	46.68	1.0	50	0	93.4	70 - 125	45.26	3.08	20
Dibromochloromethane	46.01	1.0	50	0	92.0	70 - 124	44.85	2.54	20
Dibromomethane	45.61	1.0	50	0	91.2	70 - 124	44.1	3.35	20
Dichlorodifluoromethane	35.81	1.0	50	0	71.6	70 - 130	32.45	9.84	20
Ethylbenzene	44.56	1.0	50	0	89.1	70 - 124	42.77	4.09	20
Hexachlorobutadiene	45.77	1.0	50	0	91.5	70 - 130	37.9	18.8	20
Isopropylbenzene	44.53	1.0	50	0	89.1	70 - 130	42.05	5.73	20
m,p-Xylene	88.43	2.0	100	0	88.4	70 - 130	85.32	3.58	20
Methylene chloride	46.74	2.0	50	0	93.5	70 - 128	45.25	3.24	20
Naphthalene	50.52	1.0	50	0	101	70 - 130	38.54	26.9	20 R
n-Butylbenzene	41.7	1.0	50	0	83.4	70 - 130	37.07	11.8	20
n-Propylbenzene	45.27	1.0	50	0	90.5	70 - 130	42.78	5.66	20
o-Xylene	45.71	1.0	50	0	91.4	70 - 124	43.89	4.07	20
sec-Butylbenzene	40.56	1.0	50	0	81.1	70 - 130	37.44	8	20
Styrene	47.61	1.0	50	0	95.2	70 - 130	46.13	3.16	20
tert-Butylbenzene	46.05	1.0	50	0	92.1	70 - 130	42.55	7.9	20
Tetrachloroethene	46.84	1.0	50	0	93.7	70 - 130	47.42	1.24	20
Toluene	44.93	1.0	50	0	89.9	70 - 123	43.85	2.44	20
trans-1,2-Dichloroethene	43.92	1.0	50	0	87.8	70 - 130	42.81	2.56	20
trans-1,3-Dichloropropene	45.7	1.0	50	0	91.4	70 - 121	44.92	1.71	20
Trichloroethene	47.57	1.0	50	0	95.1	70 - 129	46.23	2.87	20
Trichlorofluoromethane	40.91	1.0	50	0	81.8	70 - 130	37.6	8.44	20
Vinyl chloride	37.84	1.0	50	0	75.7	70 - 130	35.68	5.86	20
Surr: 1,2-Dichloroethane-d4	44.77	1.0	50	0	89.5	70 - 126	43.53	2.79	20
Surr: 4-Bromofluorobenzene	51.6	1.0	50	0	103	81 - 113	51.68	0.162	20
Surr: Dibromofluoromethane	47.79	1.0	50	0	95.6	77 - 123	46.89	1.9	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: LHAAP-12 501032

WorkOrder: HS17120283

QC BATCH REPORT

Batch ID: R306920											Instrument: VOA6			Method: SW8260		
MSD		Sample ID: HS17120283-03MSD			Units: ug/L			Analysis Date: 10-Dec-2017 16:24								
Client ID: 12WW20-120417		Run ID: VOA6_306920			SeqNo: 4344291		PrepDate:		DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8	52.83	1.0	50	0	106	82 - 127	52.2	1.19	20							

The following samples were analyzed in this batch:

HS17120283-01	HS17120283-02	HS17120283-03	HS17120283-04
HS17120283-05			

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.**Project:** LHAAP-12 501032**WorkOrder:** HS17120283**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Carolina	624-2017	31-Dec-2017
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018

ALS Group USA, Corp

Date: 14-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.**Project:** LHAAP-12 501032**Work Order:** HS17120283**SAMPLE TRACKING**

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS17120283-02	12WW21-120417-FD	Login	12/6/2017 9:31:57 AM	CL	Sub
HS17120283-02	12WW21-120417-FD	Login	12/6/2017 9:31:57 AM	CL	VOA019
HS17120283-03	12WW20-120417	Login	12/6/2017 9:31:57 AM	CL	Sub
HS17120283-03	12WW20-120417	Login	12/6/2017 9:31:57 AM	CL	VOA019
HS17120283-04	12WW24-120417	Login	12/6/2017 9:31:57 AM	CL	Sub
HS17120283-04	12WW24-120417	Login	12/6/2017 9:31:57 AM	CL	VOA019
HS17120283-05	Trip Blank	Login	12/6/2017 9:31:57 AM	CL	VOA019

ALS Group USA, Corp

Date: 14-Dec-17

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS17120283

Date/Time Received: **05-Dec-2017 09:45**
Received by: **JRM**

Checklist completed by: Cesar A. Lira 6-Dec-2017 Reviewed by: Sonia West 7-Dec-2017
eSignature Date eSignature Date

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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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):	2.4C/2.7C UC/C	IR25
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Cooler(s)/Kit(s):	2547
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Date/Time sample(s) sent to storage:	12/06/2017 10:00
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Water - VOA vials have zero headspace?	Yes ☒	No ☐	No VOA vials submitted ☐
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Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☒
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pH adjusted?	Yes ☐	No ☐	N/A ☒
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pH adjusted by:	
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Login Notes:

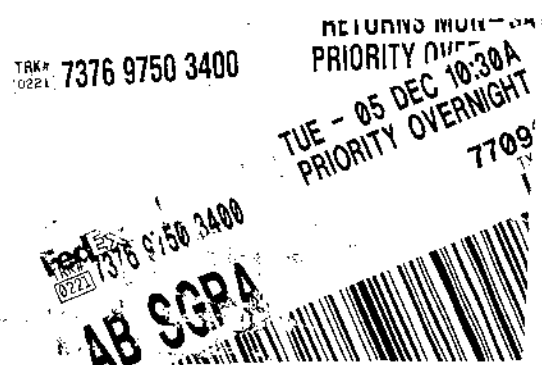
Client Contacted:	Date Contacted:	Person Contacted:
-------------------	-----------------	-------------------

Contacted By:	Regarding:
---------------	------------

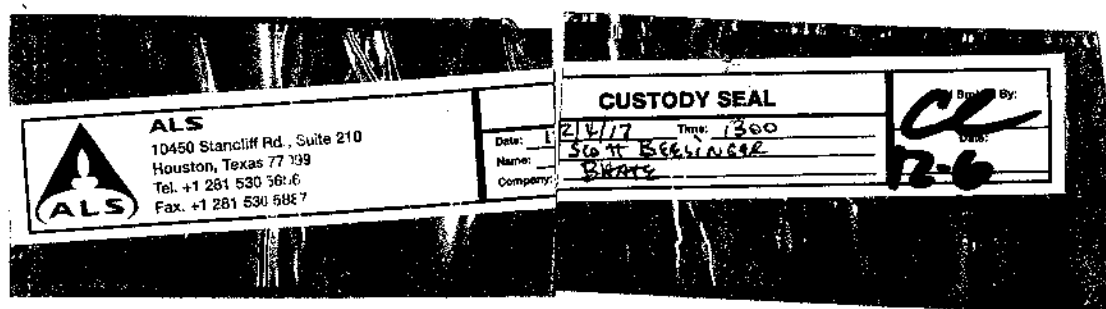
Comments:	
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Corrective Action:	
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Cochran - 2547 Temp 2.4 11225 (FG.3)



2547



ADR Data Validation Checklist Semivolatile Organics by SW846 8270D

Project Name: <u>Longhorn AAP (LHAAP-12)</u>	SDG/Report No.: <u>HS17120283</u>
Project No.: <u>501032</u>	Lab ID: <u>Empirical Labs</u>
No. of Samples: <u>3 Originals & 1 FD</u>	Matrix: <u>GW</u>
1 ST ADR / 2 ND BY <u>SP</u>	

Automated Data Review (ADR) was performed for all areas evaluate except Internal Standards. 2nd Review of these areas and retention times was performed manually and the results of the validation findings are identified in this report. It should also be noted that the ADR produces "Outlier Reports" for areas where anomalies are noted. If all QC criteria are met, no "Outlier Reports" are generated.

ADR Generated Reports:

EDD Nonconformance Report
Field QC and Associated Sample Report*
Outlier Reports
Sample Qualification Report with Reason Codes

SHAWVIEW Generated Reports:

QC Checkprint (QCVALDNT) Report

* Note: If field QC samples (i.e. ER, FB, etc.) are reported in another SDG, the SDG, blanks, detected contaminants, and associated samples are identified in the comment/discussion section provided below

All areas evaluated by **DoD_5.0** and/or SW846-8270 methods and the identification as to whether qualification is necessary is identified below:

Area Evaluated	ADR Outlier Reports	Qualification Necessary (ADR and Manual Validation)	
		YES	NO
1. Hold Time/Preservation.			X
2. DFTPP Tune			X
3. ICAL (RRF and/or 15%RSD)			X
4. CCAL opening (RRF and/or 20%D)			X
5. CCAL closing (%D<±50%)			X
6. Blanks (Method and/or Field QC)			X
7. LCS			X
8. Surrogates			X
9. MS/MSD		X	
10. Field Duplicate		X	
11. Internal Standards			X
12. Form1 vs Database/ADR			X

The following section is intended to specify areas evaluated and to provide an explanation (as applicable) for those areas where changes in ADR qualifiers were identified during the manual review and to provide an explanation (as applicable) for the need of additional qualifiers identified during the manual review.

Comments/Discussion:

ADR Data Validation Checklist Semivolatile Organics by SW846 8270D

Associated samples (4): 12WW21-120417, 12WW21-120417-FD, 12WW20-120417, and 12WW24-120417
1. Hold Time/Preservation (QAPP - Worksheet#19/SW846/ASTM methods & EPA/600/R-05/124) .
No Qualifications Necessary
Rec'd <6°C; collected 12/04/2017; prepped 12/08/2017; analyzed 12/13/2017
2. DFTPP Tune (instr. performance criteria).
No Qualifications Necessary
3. ICAL (DoD_5.0≤15%RSD or R ² >0.99 and/ SW846 8270 RRF's: J/UJ < recommended criteria)
No Qualifications Necessary
4. ICV (20%D only) / CCAL opening (DoD_5.0/SW846 8270 %D≤20% and SW846 8270 RRF's; J/UJ < recommended criteria)
No Qualifications Necessary
5. Closing CCV (DoD_5.0: %D<+50%) (if applicable by lab)
No Qualification Necessary
6. Blanks "UB" 5X/10X (EPA Region 3&4: Method and/or Field QC)
No Qualifications Necessary
MB MBLK-123073 – Result was nondetect.
7. LCS (QAPP – Worksheet#12/#28)
No Qualification Necessary
LCS LCS-123073 – Criteria was met.
8. Surrogates (QAPP – Worksheet#12/#28);; (note: for water analysis, surrogate phenol-d6 is not listed in 5.0 and listed as advisory in 4.2)
No Qualifications Necessary
Criteria were met.
9. MS/MSD (QAPP – Worksheet#12/#28; parent sample only)
Qualifications Necessary
12WW20-120417-MS/MSD – %Rs: 1,4-Dioxane (ok/-90.0%); Qualify 1,4-Dioxane estimated, J-08A.
10. Field Duplicate (QAPP – Worksheet#35 - WATERS ≤20% / SOILS ≤50%)
(non-detect & result <RL or both <RL no qualifiers / non-detect & result >RL "J/UJ" qualifiers)
Qualifications Necessary
12WW21-120417/12WW21-120417-FD – 1.6 ug/L / 1.1 ug/L with RPD = 37.04; Qualify estimate, J-17.

ADR Data Validation Checklist
Semivolatile Organics by SW846 8270D

11. Internal Standards (DoD/QAPP – Worksheet#12/#28; -50% to +100% and RT $\pm$ 0.5sec)
No Qualifications Necessary
12. Form 1 vs Database/ADR
Check laboratory's Form1 against Database; one sample per SDG per fraction; list sample number:
13. Multiple Results
No Qualifications Necessary

ADR Data Validation Checklist Volatile Organics by SW846 8260C

Project Name: <u>LHAAP-17</u>	SDG/Report No.: <u>HS17120283</u>
Project No.: _____	Lab ID: <u>ALS-Houston</u>
No. of Samples: <u>3 Originals & 1 FD</u>	Matrix: <u>GW</u>
1 ST ADR / 2 nd by <u>SP</u>	

Automated Data Review (ADR) was performed for all areas evaluate except internal standards. 2ND Review of these areas was performed manually and the results of the validation findings are identified in this report. It should also be noted that the ADR produces "Outlier Reports" for areas where anomalies are noted. If all QC criteria are met, no "Outlier Reports" are generated.

ADR Generated Reports

EDD Nonconformance Report
Field QC and Associated Sample Report*
Outlier Reports
Sample Qualification Report with Reason Codes

EQUIs Generated Reports (Copies Attached):

QC Checkprint (QCVALDNT) Report

* Note: If field QC samples (i.e. TB, ER, FB, etc.) are reported in another SDG, the SDG, blanks, detected contaminants, and associated samples are identified in the comment/discussion section provided below

All areas evaluated by **DoD_5.0** and/or SW846 8260 methods and the identification as to whether qualification is necessary are identified below:

Area Evaluated	ADR Outlier Reports	Qualification Necessary (ADR and Manual Validation)	
		YES	NO
1. Hold Time/Preservation.			X
2. BFB Tune.			X
3. ICAL (RRF and/or %RSD)			X
4. CCAL opening (RRF and/or 20% D)			X
5. CCAL closing (%D<±50%)			X
6. Blanks (Method and/or Field QC)			X
7. LCS			X
8. Surrogates			X
9. MS/MSD		X	
10. Field Duplicate			X
11. Internal Standards			X
12. Form1 vs Database/ADR			X

The following section is intended to specify areas evaluated and to provide an explanation (as applicable) for those areas where changes in ADR qualifiers were identified during the manual review and to provide an explanation (as applicable) for the need of additional qualifiers identified during the manual review.

Comments/Discussion:

ADR Data Validation Checklist Volatile Organics by SW846 8260C

Associated samples (4): 12WW21-120417, 12WW21-120417-FD, 12WW20-120417, and 12WW24-120417
1. Hold Time/Preservation (QAPP - Worksheet#19/SW846/ASTM methods).
No Qualification Necessary
Rec'd <6°C; collected 12/04/2017; analyzed 11/20/2017
2. BFB Tune (instr. performance criteria)
No Qualification Necessary
3. ICAL (DoD: $RSD \leq 15\%$ or linear $R^2 \geq 0.99$ and Avg RRF's; 2-butanone & acetone >0.05; J/UJ < recommended criteria)
No Qualification Necessary
4. ICV (20%D only) /CCAL opening (DoD: %D ≤ 20% and/or SW846 8260 Table 4 Avg RRF's: J/UJ < recommended criteria)
No Qualification Necessary
5. Closing CCV (DoD_5.0: %D ≤ +50%) (if applicable by lab)
No Qualification Necessary
6. Blanks "UB" 5X/10X (EPA Region 3&4: Method and/or Field QC)
No Qualification Necessary
TB 12TB01-120417 – Acetone 2.3 ug/L (10x=23.0); All samples are nondetect; Therefore, no qualification..
VBLKW-171210 – Results are nondetect.
7. LCS (QAPP – Worksheet#12/#28)
No Qualification Necessary
VLCSW-171210 – Criteria were met.
8. Surrogates (QAPP - Worksheet#12/#28)
No Qualification Necessary – All recoveries were within acceptance criteria.
9. MS/MSD (DoD/QAPP – Worksheet#12/#28; parent sample only)
Qualification Necessary
12WW20-120417-MS/MSD – %Rs: Dichlorodifluoromethane (64.9%/ok); RPDs: 1,2,3-Trichlorobenzene (26.8), Naphthalene (26.9); Qualify dichlorodifluoromethane estimated, J-08A, due to low %R & 1,2,3-trichlorobenzene and naphthalene estimated, J-08B, for sample 12WW20-120417.

ADR Data Validation Checklist Volatile Organics by SW846 8260C

10. Field Duplicate (QAPP – Worksheet#12 - WATERS $\leq 20\%$ / SOILS $\leq 50\%$)							
(non-detect & result <RL or both <RL no qualifiers / non-detect & result >RL “J/UJ” qualifiers)							
No Qualification Necessary – Criteria were met.							
12WW21-120417/12WW21-120417-FD – All results are nondetect.							
VOCs	Method	Units	12WW21-120417	LQ	12WW21-120417-FD	LQ	%RPD
1,1-Dichloroethene	8260B	ug/kg					
1,2-Dichloroethane	8260B	ug/kg					
cis-1,2-Dichloroethene	8260B	ug/kg					
Tetrachloroethene	8260B	ug/kg					
Trichloroethene	8260B	ug/kg					
11. Internal Standards (DoD/QAPP – Worksheet#12/#28; -50% to +100% and RT ± 0.5 sec)							
No Qualification Necessary							
12. Form 1 vs Database/ADR							
Check laboratory's Form1 against Database; one sample per SDG per fraction; list sample number:							
13. Multiple Results							
No Qualification Necessary							

Appendix E

Mann-Kendall Trend Test Results

APPENDIX E

MANN-KENDALL TEST METHODOLOGY

The Mann-Kendall Test is a nonparametric statistical test to assess trends and is especially suited for evaluation of concentration-time series data to establish if trends are present (R.O. Gilbert 1987). This is a general test to determine whether concentrations tend to increase or decrease with time. The test uses a time-ordered sequence of concentrations, calculating the difference between a more recent concentration and earlier concentrations. A score of one is assigned for each positive difference; a score of negative one is assigned for each negative difference. The Mann-Kendall statistic (S) is the sum of the scores. The total number of samples (n) and the value of S are used in upper tail probabilities for the null distribution of Kendall's K statistic table to obtain a probability value (ρ) for the trend (R.O. Gilbert 1987) (M. Hollander and D.A. Wolfe 1973). Table A.21, an excerpt from this statistical table, is included in this Appendix. If ρ is less than the critical value (α), then the trend is considered statistically significant, at that level, with a confidence level of $1-\alpha$. The critical value for a 95% confidence level is $\alpha = 0.05$; therefore, if ρ is ≤ 0.05 , the trend is statistically significant at a 95% confidence level.

If the trend is determined not to be statistically significant, a measurement of the variability in the data set is evaluated to determine if the trend is stable. Where the data appear to fluctuate around a value, the trend may be stable if there is sufficiently low variation between the mean concentration ($\bar{X}$) and the least squares regression line for the time-concentration series (i.e., the trend line). The statistical measure of this variability is the coefficient of variation (CV), which is the quotient of the standard deviation (s) divided by the mean ($\bar{X}$):

$$CV = \frac{s}{\bar{X}}$$

If the coefficient of variation is less than 1, the trend is interpreted as being stable.

Half of the detection limit is used for non-detect results, where applicable. Field duplicate data was not used, only the original sample. The Mann-Kendall Test was conducted for 12WW24 where trichloroethene showed an exceedance in concentration above the maximum contaminant level (MCL).

Appendix E
Mann-Kendall Test

Well: 12WW24																			
Chemical: Trichloroethene																			
Maximum Contaminant Level: 5 micrograms per liter (µg/L)																			
	Date	12/19/2006	9/5/2007	12/19/2007	3/5/2008	6/4/2008	9/11/2008	3/4/2009	4/29/2009	7/14/2009	6/16/2010	6/7/2011	1/15/2014	1/1/2015	12/15/2015	12/16/2016	12/4/2017		
	Concentration (µg/L)	396	272	313	301	237	185	334	197	204	145	147	259	353	278	151	83	Positive	Negative
12/19/2006	396	0	-124	-83	-95	-159	-211	-62	-199	-192	-251	-249	-137	-43	-118	-245	-313	0	15
9/5/2007	272		0	41	29	-35	-87	62	-75	-68	-127	-125	-13	81	6	-121	-189	5	9
12/19/2007	313			0	-12	-76	-128	21	-116	-109	-168	-166	-54	40	-35	-162	-230	2	11
3/5/2008	301				0	-64	-116	33	-104	-97	-156	-154	-42	52	-23	-150	-218	2	10
6/4/2008	237					0	-52	97	-40	-33	-92	-90	22	116	41	-86	-154	4	7
9/11/2008	185						0	149	12	19	-40	-38	74	168	93	-34	-102	6	4
3/4/2009	334							0	-137	-130	-189	-187	-75	19	-56	-183	-251	1	8
4/29/2009	197								0	7	-52	-50	62	156	81	-46	-114	4	4
7/14/2009	204									0	-59	-57	55	149	74	-53	-121	3	4
6/16/2010	145										0	2	114	208	133	6	-62	5	1
6/7/2011	147											0	112	206	131	4	-64	4	1
1/15/2014	259												0	94	19	-108	-176	2	2
1/1/2015	353													0	-75	-202	-270	0	3
12/15/2015	278														0	-127	-195	0	2
12/16/2016	151															0	-68	0	1
12/4/2017	83																0	0	0
																		38	82
Notes:																			
count:n	16																		
Average/mean	241																		
std dev	88																		
Sum (Neg + Pos): s	44	("x" on statistical table A.21)																	
ρ (cross of n and s)	0.026	(Value from statistical table A.21)																	
α : defined significance	0.05																		
Signifcant trend?	Yes																		
coefficient of variaton	0.37	(When less than 1, plume considered stable)																	
Stable?	Yes																		
Results:																			
There is a trend at a 95% confidence, and the concentrations are stable around the mean.																			

Table A.21. Upper tail probabilities for the null distribution of Kendall's K statistic: $n = 4(1)40$

For a given n , the entry in the table for the point x is $P_0\{K > x\}$. Under these conditions, if x is such that $P_0\{K > x\} = \alpha$, then $k(\alpha, n) = x$. For certain n , the entries are terminated at x_n , where x_n is the smallest possible value of x such that $P_0\{K > x\}$ is zero to three decimal places. [For $n = 4(4)40$ or $n = 5(4)37$ all even integers between $-n(n-1)/2$ and $n(n-1)/2$ have positive probability and for $n = 6(4)38$ or $n = 7(4)39$ all odd integers between $-n(n-1)/2$ and $n(n-1)/2$ have positive probability.]

x	n								
	4	5	8	9	12	13	16	17	20
0	.625	.592	.548	.540	.527	.524	.518	.516	.513
2	.375	.408	.452	.460	.473	.476	.482	.484	.487
4	.167	.242	.360	.381	.420	.429	.447	.452	.462
6	.042	.117	.274	.306	.369	.383	.412	.420	.436
8		.042	.199	.238	.319	.338	.378	.388	.411
10		.008	.138	.179	.273	.295	.345	.358	.387
12			.089	.130	.230	.255	.313	.328	.362
14			.054	.090	.190	.218	.282	.299	.339
16			.031	.060	.155	.184	.253	.271	.315
18			.016	.038	.125	.153	.225	.245	.293
20			.007	.022	.098	.126	.199	.220	.271
22			.002	.012	.076	.102	.175	.196	.250
24			.001	.006	.058	.082	.153	.174	.230
26			.000	.003	.043	.064	.133	.154	.211
28				.001	.031	.050	.114	.135	.193
30				.000	.022	.038	.097	.118	.176
32					.016	.029	.083	.102	.159
34					.010	.021	.070	.088	.144
36					.007	.015	.058	.076	.130
38					.004	.011	.048	.064	.117
40					.003	.007	.039	.054	.104
42					.002	.005	.032	.046	.093
44					.001	.003	.026	.038	.082
46					.000	.002	.021	.032	.073
48						.001	.016	.026	.064
50						.001	.013	.021	.056
52						.000	.010	.017	.049
54							.008	.014	.043
56							.006	.011	.037
58							.004	.009	.032
60							.003	.007	.027
62							.002	.005	.023
64							.002	.004	.020
66							.001	.003	.017
68							.001	.002	.014
70							.001	.002	.012



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

September 14, 2018

DAIM-ODB-LO

Mr. Rich Mayer
U.S. Environmental Protection Agency
Federal Facilities Section R6
1445 Ross Avenue
Dallas, TX 75202-2733

**Re: Draft Final Pre-Design Investigation Report, LHAAP-17 Burning Ground No. 2/
Flashing Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas,
September 2018**

Dear Mr. Mayer,

One hard copy and one compact disc (CD) of the above-referenced document are being transmitted to you for your records. The document includes revisions based upon the Environmental Protection Agency's (EPA) comments on the Draft version received on August 15, 2018, and Texas Commission on Environmental Quality's (TCEQ) comments received on August 16, 2018. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment. Response to comments on the Draft version of the document are included with this Draft Final.

The document was prepared by 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 Kim Nemmers, 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 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is positioned above the typed name.

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:

- A. Palmie, TCEQ, Austin, TX (letter)
- P. Bruckwicki, Caddo Lake NWR, TX (1 hard copy and 1 CD)
- A. Williams, USACE, Tulsa District, OK (1 CD)

N. Smith, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 hard copy and 1 CD)
P. Srivastav, APTIM, Houston, TX (1 hard copy and 1 CD)



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

September 14, 2018

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

**Re: Draft Final Pre-Design Investigation Report, LHAAP-17 Burning Ground No. 2/
Flashing Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas,
September 2018**

Dear Ms. Palmie,

One hard copy and one compact disc (CD) of the above-referenced document are being transmitted to you for your records. The document includes revisions based upon the Environmental Protection Agency's (EPA) comments on the Draft version received on August 15, 2018, and Texas Commission on Environmental Quality's (TCEQ) comments received on August 16, 2018. In accordance with Federal Facility Agreement, this Draft Final will be considered Final after 30 days without further comment. Responses to comments on the Draft version of the document are included with this Draft Final.

The document was prepared by 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 Kim Nemmers, 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 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

A handwritten signature in cursive script, reading "Rose M. Zeiler", is located below the "Sincerely," text.

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished (letter only):
R. Mayer, USEPA Region 6, Dallas, TX
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, Tulsa District, OK
N. Smith, USAEC, San Antonio, TX

K. Nemmers, Bhate, Lakewood, CO
P. Srivastav, APTIM, Houston, TX

**Response to Comments on
Draft Pre-Design Investigation Report
LHAAP-17 Burning Ground No. 2 / Flashing Area, Group 2**

**Document Date: 16 July 2018
Comment Date: 15 August 2018**

**Reviewer: Mr. Richard Mayer, USEPA
Respondent: Dr. Rose Zeiler**

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X)
2. Commenter Agrees (A) with response, or Does Not Agree (D) with response

Comment No.	Section, Page ref.	USEPA Comment	C, D, E, or X¹	Response	A or D²
1.	Page 3-2, Section 3.1, 1 st Paragraph	The report indicates that the perchlorate in monitoring well 18WW10 (perchlorate at 52 ppb) is coming from Site 18/24. Has this well detected perchlorate in previous sampling events? It should be noted that monitoring wells MW-10 and MW-17, which are located to the east-southeast, had no detections of perchlorate.	C	18WW10 was installed in 1995 and sampled in 2000, 2002, 2007, 2008, 2009, 2010, 2011, 2012, and 2017 according to the LHAAP database. The only perchlorate detection in 18WW10 prior to 2017 was a 1.73 µg/L J-flagged (estimated) concentration detected in 2007. The presence of a generally westward groundwater gradient in the area and clean wells 17WW12 and 17WW20 suggest that the contamination at 18WW10 is not from LHAAP-17. Wells MW-10 and MW-17 to the east of 18WW10 are sampled as part of the semiannual sampling associated with LHAAP-18/24. Even though these wells did not have perchlorate detections in November 2017, perchlorate concentrations were detected in samples from MW-10 in 2013, 2014, 2015, and 2016 at concentrations up to 156 µg/L (June 2014). Perchlorate was also detected in MW-17 in samples from 2013, 2014, and 2015, with a maximum concentration of 24.4 µg/L (December 2015). Please see page 3-2 of the redline for text changes. Any ongoing monitoring of 18WW10 will be incorporated into the monitoring program for	

Comment No.	Section, Page ref.	USEPA Comment	C, D, E, or X ¹	Response	A or D ²
				LHAAP-18/24. Continued groundwater elevation gauging of 18WW10 will be part of the monitoring program for LHAAP-17 that will be presented in the RD/RAWP. Groundwater elevation data from LHAAP-18/24 will continue to be used for development of potentiometric surface maps for LHAAP-17.	
2.	Page 4-4, Conclusions for Soil Sampling, 1 st Paragraph	EPA is fine in submitting the remaining 13 soil sample results during the RD, as long as the RD is not delayed. However, if the remaining soil samples are completed and the RD is delayed, EPA prefers that the results be submitted to both agencies.	C	Samples were collected from the remaining locations in mid-August 2018, except at some depths that were inaccessible because of subsurface obstructions encountered when using the hand auger. Additional deeper samples may need to be collected using a DPT rig based on the results of the August 2018 samples. The validated data will be submitted to both agencies at the Monthly Manager's Meeting following completion of the sample validation. A delay in the RD is not anticipated at this time.	
3.	Page 4-4, Conclusions for Soil Sampling, 2 nd Paragraph	EPA agrees that the northwest and southeast quadrants have not been delineated. For clarity, the excavation areas will go to the boundaries of the site (assuming the confirmation sampling indicates "clean" soil samples found at the site boundaries) as shown on Figure 4-2?	C	The initial excavation boundary presented in the RD will likely be approximately 20-25 feet beyond the outermost contaminated soil sample location for areas that are not fully delineated. Confirmation samples collected following excavation will determine whether additional excavation is needed.	
4.	Page 2-3, Section 2-5, 2 nd Paragraph	The third supply well is located 30 feet east of the USFWS administration building.	C	The text in the 3 rd sentence of the 2 nd paragraph of Section 2,5 will be revised to state: "The third well is located <i>30 feet east</i> of the USFWS administration building for the Caddo Lake National Wildlife Refuge, near the main entrance to LHAAP"	
5.	Appendix A, Groundwater and Soil Sample Collection Logs	EPA assumes that the collection forms submitted for this report are not the original forms completed. Please include the method used for the analysis conducted for both the groundwater and soil forms. Also, for each	C	The groundwater and soil collection forms are generated from electronic files that are created from entry of the information into a handheld tablet in the field. The sampler signs the form electronically by entering his name before upload of the electronic	

Comment No.	Section, Page ref.	USEPA Comment	C, D, E, or X ¹	Response	A or D ²
		well sampled, there should be a PID reading when initially opening the well. All forms submitted in this report indicate N/A (except for 17WW20). The sample collection log for monitoring well 17WW20 is a good example of filling out the required items.		data. The forms included in the report have been regenerated to add the analytical method(s) and/or complete the missing fields using information included in field notes. Regarding the PID readings, the collection of PID readings is not required by the SOPs in the IWWP, but they may be collected for health and safety reasons where warranted. In cases where the PID reading is collected, the reading will be included on the form.	
6.	Appendix B, Monitoring Well and Piezometer Boring Logs, Construction Diagrams and Development Records	On some of the well/boring logs the PID readings are missing. Also, on the monitoring well development forms, some have information missing such as time, pumping rates, volume of water removed and depth to water.	C	The PID readings for 17PZ01 were not recorded because the PID was not functioning properly when readings were attempted. The PID was recalibrated prior to the drilling of the additional piezometers on 12/13/17 and readings were recorded on those logs. We will review the field notes and update the monitoring well development forms with additional information where possible. The field crew will be reminded of the need to fill in all information on the forms in the future.	
7.	Figures 4-2 and 1-3	The drainage ditch on the west side of the site is shown with different routes in figures 4-2 and 1-3. Which figure has the correct location/route of the drainage ditch?	C	Figure 1-3 is the correct depiction. Figure 4-2 will be revised to depict the ditches as shown on Figure 1-3. Figures 3-1 and 3-2 also were revised to show the ditches on Figure 1-3.	
8.	General Comment	There were some very dramatic changes in concentrations in the wells sampled. Several wells had dramatic decreases in perchlorate concentrations. Only one well had an increase in perchlorate. One well had a dramatic increase in TCE and its daughters. It will be interesting to see if this trend continues in the next round of sampling.	C	Noted. The data from future sampling will continue to be evaluated for trends.	

**Response to Comments on
Draft Pre-Design Investigation Report
LHAAP-17 Burning Ground No. 2 / Flashing Area, Group 2**

**Document Date: 16 July 2018
Comment Date: 16 August 2018**

Reviewer: Ms. April Palmie, TCEQ

1. Respondent Concurs (C), Does Not Concur (D), Takes Exception (E), or Delete (X)
2. Commenter Agrees (A) with response, or Does Not Agree (D) with response

Comment No.	Section, Page ref.	TCEQ Comment	C, D, E, or X¹	Response	A or D²
1.	General	TCEQ agrees with EPA's comments, especially 1, 2, and 8.	C	Noted.	
2.	Page 4-4	Conclusions – If the soil samples are completed and the RD is delayed, TCEQ requests a PDI Addendum or Technical Memo to document the results.	C	Please see response to USEPA Comment 2; no delay in the RD is anticipated at this time. The data will be provided during a Monthly Manager's Meeting after data validation and at that time, the appropriate reporting of the results will be discussed.	
3.	Figure 4-1 and 4-2	The labels for inaccessible locations are not legible. Please remove the purple halo behind the well labels.	C	The figures will be revised as requested.	
4.	Appendices	Please include a minimal number of pdfs with the final report. Preferable, this would be no more than one per large appendix.	C	The number of PDF files will be minimized to the degree possible. The electronic files for the aquifer pumping test data were provided in native format in order to allow for full review if desired, but can be printed and/or incorporated into the main PDF for the Draft Final.	



Draft Final
**Pre-Design Investigation Report,
LHAAP-17 Burning Ground No. 2 /
Flashing Area, Group 2**
Longhorn Army Ammunition Plant
Karnack, Texas



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Acronyms and Abbreviations

µg/L	micrograms per liter
K	Hydraulic Conductivity
Q/s	specific capacity
S	Storativity
T	Transmissivity
AECOM	AECOM Technical Services, Inc.
APTIM	Aptim Federal Services, LLC
bgs	below ground surface
Bhate	Bhate Environmental, Inc.
BRAC	Base Realignment and Closure
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COC	chemicals of concern
COPEC	chemicals of potential ecological concern
DCE	dichloroethene
DNT	dinitrotoluene
DPT	direct-push technology
EPA	see USEPA
FFA	Federal Facility Agreement
ft	feet
gpm	gallons per minute
GWP-Ind	groundwater medium-specific concentration for industrial use
GWTP	groundwater treatment plant
IWWP	Installation-Wide Work Plan
Jacobs	Jacobs Engineering Group, Inc.
LHAAP	Longhorn Army Ammunition Plant
LUC	land use controls
MATOC	Multiple Award Task Order Contract
MEGA	Multiple Environmental Government Acquisition
mg/kg	milligrams per kilogram
MMRP	Military Munitions Response Program
MNA	monitored natural attenuation
MOA	Memorandum of Agreement
NPL	National Priorities List
PDI	Pre-Design Investigation

Acronyms and Abbreviations *(continued)*

Plexus	Plexus Scientific Corporation
PVC	polyvinyl chloride
RAOs	remedial action objectives
RD	remedial design
ROD	Record of Decision
Shaw	Shaw Environmental, Inc.
TAC	Texas Administrative Code
TCDD	tetrachlorodibenzo-p-dioxin
TCE	trichloroethene
TCEQ	Texas Commission on Environmental Quality
TEC	toxicity equivalence concentration
TNT	trinitrotoluene
USACE	U.S. Army Corps of Engineers
U.S. Army	U.S. Department of the Army
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOCs	volatile organic compounds

PRE-DESIGN INVESTIGATION REPORT, LHAAP-17 BURNING GROUND NO. 2/ FLASHING AREA, GROUP 2

1.0 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Tulsa District, contracted Bhate Environmental, Inc. (Bhate), under the Omaha Multiple Environmental Government Acquisition (MEGA) National Small Business Multiple Award Task Order Contract (MATOC) Environmental Remediation Services with Military Munitions Response Program (MMRP), Task Order No. W9128BV17F0150 to conduct environmental restoration of LHAAP-17 at Longhorn Army Ammunition Plant (LHAAP). The Bhate Team is comprised of Bhate and Aptim Federal Services, LLC (APTIM). LHAAP is an inactive, government owned formerly contractor operated and maintained Department of Defense facility located central east Texas (**Figure 1-1**). This report summarizes the field activities performed to implement the activities in the Pre-Design Investigation (PDI) Work Plan for LHAAP-17 (AECOM 2016) and provides the results of laboratory analyses (soil and groundwater) and aquifer pumping test results. The PDI was conducted to collect information for preparation of the Remedial Design (RD) and Remedial Action Work Plan to implement the selected remedy for LHAAP-17, as described in the *Final Record of Decision* (ROD) for LHAAP-17 (Shaw 2016).

1.1 Report Organization

This document is composed of the following sections:

- **Section 1.0:** “Introduction” summarizes the site background, selected remedy, and remedial action objectives (RAOs)
- **Section 2.0:** “Conceptual Site Model” summarizes the geology and hydrogeology of the site, as well as the nature and extent of contamination
- **Section 3.0:** “Groundwater Evaluation” describes collection of updated groundwater samples, the installation of a new monitoring well, and summarizes the findings from the groundwater analytical data
- **Section 4.0:** “Soil Investigation” describes the collection and analysis of soil samples to refine the area of contaminated soil requiring excavation under the selected remedy
- **Section 5.0:** “Aquifer Pumping Test” summarizes the installation of three new piezometers, and describes the methodology and data evaluation for the aquifer pumping test performed
- **Section 6.0:** “Conclusions” summarizes the results from Sections 3.0, 4.0, and 5.0 and highlights remaining data needs
- **Section 7.0:** “References” provides a list of references cited in the document

This report also includes the following appendices supporting the main text.

- **Appendix A** includes the groundwater and soil sample collection logs
- **Appendix B** includes the boring logs and well completion diagrams for the newly installed Shallow Zone monitoring well and piezometers
- **Appendix C** includes the soil and groundwater analytical data reports (provided on compact disc [CD])
- **Appendix D** includes the aquifer pumping test well data plots
- **Appendix E** includes the aquifer pumping test data files (provided on CD)

1.2 Site Description and Background

LHAAP is approximately 14 miles northeast of Marshall, Texas, and approximately 40 miles west of Shreveport, Louisiana. The installation occupies approximately 1,100 of its former 8,416 acres between State Highway 43 at Karnack, Texas, and the western shore of Caddo Lake. The facility can be accessed via State Highways 43 and 134.

LHAAP was placed on the Superfund National Priorities List (NPL) on 9 Aug 1990. Activities to remediate contamination began in 1990. After its listing on the NPL, the U.S. Department of the Army (U.S. Army), the U.S. Environmental Protection Agency (USEPA), and the Texas Water Commission (now the Texas Commission on Environmental Quality [TCEQ]) entered into a CERCLA §120 Federal Facility Agreement (FFA) for remedial activities at LHAAP. The FFA became effective 30 Dec 1991. LHAAP operated until 1997 when it was placed on inactive status and classified by the U.S. Army Armament, Munitions, and Chemical Command as excess property. LHAAP has been under the administrative control of the Base Realignment and Closure (BRAC) Division of the Army since 2003. The majority of LHAAP has been transferred by the U.S. Army to the U.S. Fish and Wildlife Service (USFWS) for management as the Caddo Lake National Wildlife Refuge (Shaw 2016).

LHAAP-17, an NPL site, known as the Burning Ground No. 2/Flashing Area, is a 3.9-acre site located within a heavily wooded section in the southeastern portion of LHAAP (**Figure 1-2**). The site has two 185 feet (ft) by 305 ft cleared areas, separated by a gravel access road. The site is covered with grass and scattered brush, has been graded above the surrounding terrain, and is relatively flat. LHAAP-17 was used as a burning ground from 1959 through 1980 (Plexus 2005). Bulk trinitrotoluene (TNT), photo flash powder, and reject material from Universal Match Corporation operations were burned at LHAAP-17. In 1959, the materials removed from the former TNT Production Area (LHAAP-29) and the former TNT Waste Disposal Plant (LHAAP-32) during demolition were burned and/or flashed at LHAAP-17. The site was used as a flashing area to decontaminate recoverable metal byproducts until 1980,

when it became inactive. Burning trenches were located around the inside perimeter of the previously fenced area and within the open area on the western boundary of the site (**Figure 1-3**). As each trench filled with ash, it was covered and a new trench was dug. The waste residues were reportedly removed from the trenches in 1984, and the site was allowed to revegetate (Jacobs 2002).

The U.S. Army issued the Final ROD for LHAAP-17 (Shaw 2016) in August 2016, and it was signed by the Army on August 16, 2016 and the USEPA on September 13, 2016. The TCEQ issued a letter concurring with the ROD on September 6, 2016. The ROD identified chemicals of concern (COCs) for human health and chemicals of potential ecological concern (COPEC) as shown on **Table 1-1**. The remedy selected in the ROD included excavation and off-site disposal of soil, groundwater extraction, monitored natural attenuation (MNA), and land use controls (LUCs) to maintain the remedy and prohibit groundwater use until COC concentrations are reduced to levels supportive of unlimited use and unrestricted exposure. The human health and ecological cleanup levels are shown in **Tables 1-2** and **1-3**, respectively.

Table 1-1
COCs and COPECs for LHAAP-17

Media	Chemicals of Concern (Human Health)	Chemicals of Potential Ecological Concern (COPEC)
Soil	2,4,6-trinitrotoluene (TNT), 2,4-dinitrotoluene (DNT), 2,6-DNT, and perchlorate	Barium, 2,4-DNT, 2,6-DNT, 2,4,6-TNT, and 2,3,7,8 tetrachlorodibenzo-p-dioxin (TCDD)
Shallow Zone Groundwater	1,1-dichloroethene (DCE), 1,2-dichloroethane, cis-1,2-DCE, trichloroethene (TCE), vinyl chloride, and perchlorate	Not applicable
Intermediate Zone Groundwater	cis-1,2-DCE, TCE, vinyl chloride	Not applicable

A PDI Work Plan was published in November 2016 following approval of the Final ROD (AECOM 2016). The goal of the activities described in the PDI Work Plan was described in Section 3.1 of the PDI Work Plan as:

- Redevelop wells, gauge groundwater levels, and collect groundwater samples from site monitoring wells to update potentiometric surface maps and isoconcentration maps before completing a Shallow Zone pumping test.
- Install up to three new monitoring wells based on the static water levels and COC concentrations detected in groundwater samples from the existing site monitoring

wells (and reported from selected wells at LHAAP-18/24, including wells along the western edge during concurrent routine monitoring events).

- Conduct additional soil sampling to refine the extent of soil contamination that exceeds the clean-up levels and requires soil removal and off-site disposal.
- Conduct a Shallow Zone pumping test to estimate site hydraulic parameters that will be used to design the proposed groundwater extraction system.

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2.0 CONCEPTUAL SITE MODEL

The following sections provide a summary of the LHAAP-17 conceptual model as described in the Final ROD (Shaw 2016) and PDI Work Plan (AECOM 2016).

2.1 Geology and Hydrogeology

The local geology at LHAAP-17 consists of silty, clayey, and sandy units of the Wilcox Group. The uppermost unit consists predominantly of silty clay-to-clay extending to depths ranging from 5 to 30 ft. Underlying this layer is a gray to light brown, fine grained silty sandy unit interbedded with silty clay-to-clay lenses. The clay layers act as an aquitard separating the Shallow Zone from the Intermediate Zone. Boring 17WW05 was drilled to a total depth of 150 ft below ground surface (bgs). In this boring, a thick, relatively homogeneous fine- to medium-grained sand was encountered from approximately 50 to 150 ft bgs and reflects the geology of the Lower Wilcox Formation.

The Intermediate and Deep Zones comprise the Wilcox Formation, which is separated from the Shallow zone by a Wilcox clay layer. With the exception of two monitoring wells, 17WW05 and 17WW16, which were completed in the Deep Zone (lower Wilcox), the remainder of the monitoring wells at the site has been completed in the Shallow Zone and Intermediate Zone (upper Wilcox). The depth of the Shallow Zone groundwater generally ranges between 10 and 35 ft bgs. The Intermediate Zone (upper Wilcox) extends below the Wilcox clay at approximately 55 ft bgs. The Deep Zone extends below the upper Wilcox to a depth of approximately 150 ft bgs based on information from well 17WW05. Groundwater elevations from two sets of co-located wells measured in November 2017 indicated that the groundwater elevation in the Intermediate Zone is generally lower than the groundwater elevation in the Shallow Zone (the groundwater elevation in Intermediate Zone well 17WW09 was lower by 0.12 ft compared to the groundwater elevation in Shallow Zone well 17WW10; similarly, the groundwater elevation in Intermediate Zone well 17WW07 was lower by 0.46 ft compared to the groundwater elevation in Shallow Zone well 17WW08). The general groundwater flow direction depicted based on the November 2017 LHAAP-17 potentiometric data in the Shallow Zone and the November 2017 LHAAP-18/24 potentiometric data from the *Draft Quarterly Evaluation Report, 4th Quarter (October-December) 2017* (Bhate 2018a) is to the west (**Figure 2-1**), while the Intermediate Zone flow is predominantly to the north (**Figure 2-2**).

2.2 Nature and Extent of Contamination

Contamination was found in the soil and groundwater (Shallow and Intermediate Zones). The COCs are toxic and, with the exception of perchlorate, carcinogenic. Principal threat waste material is present in the contaminated soil at LHAAP-17. According to the Final ROD

(Shaw 2016), the maximum 2,4,6-TNT in the soil is 10,000 milligrams per kilogram (mg/kg). Other explosives, 2,4-dinitrotoluene (DNT) and 2,6-DNT, have maximum concentrations of 4,000 mg/kg and a concentration of 27.5 mg/kg (2018), respectively. The concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxicity equivalence concentration (TEC), and barium potentially affecting ecological receptors are 1.9×10^{-4} mg/kg and 20,500 mg/kg, respectively.

2.3 Current and Future Land Use

LHAAP is located near the unincorporated community of Karnack, Texas. Karnack is a rural community with a population of approximately 775 people. The incorporated community of Uncertain, Texas, approximate population 205, is located to the northeast of LHAAP on the edge of Caddo Lake and is a resort area and an access point to Caddo Lake. The industries in the surrounding area consist of agriculture, timber, oil and natural gas production, and recreation.

LHAAP has been an industrial facility since 1942. Production activities and associated waste management activities continued until the facility was determined to be in excess of the U.S. Army's needs in 1997. The plant area has been relatively dormant since that time. LHAAP is surrounded by a fence (except on the border with Caddo Lake) with an access gate that is locked after daylight hours, which restricts public access. The fence now represents the National Wildlife Refuge boundary. The public can access most of the facility during the day with additional fencing and signage restricting access from some environmental sites.

The reasonably anticipated future use of LHAAP-17 is part of a national wildlife refuge. This anticipated future use is based on a Memorandum of Agreement (MOA) (U.S. Army 2004) between the USFWS and the U.S. Army. That MOA documents the transfer process of the LHAAP acreage to USFWS to become the Caddo Lake National Wildlife Refuge and will be used to facilitate a future transfer of LHAAP-17. Presently the Caddo Lake National Wildlife Refuge occupies approximately 7,000 acres of the 8,416-acre former installation. In accordance with the National Wildlife Refuge System Administration Act of 1966 and its amendments (16 USC 668dd), the land will remain as a national wildlife refuge unless there is a change brought about by an act of Congress, or the land is part of an exchange authorized by the Secretary of the Interior. (Shaw 2016).

2.4 Current and Future Surface Water Use

Streams on LHAAP currently support wildlife and aquatic life. While humans may have limited access to some streams during annual hunts, there is no routine human use of streams on LHAAP. The streams do not carry adequate numbers and size of fish to support either sport or subsistence fishing. During the summer months, the streams cease flowing and/or dry up.

The streams flow into Caddo Lake. Caddo Lake is a large recreational area that covers 51 square miles and has a mean depth of 6 ft. The watershed of the lake encompasses approximately 2,700 square miles. It is used extensively for fishing and boating. Caddo Lake is a drinking water supply for multiple cities in Louisiana including Vivian, Oil City, Mooringsport, South Shore, Blanchard, Shreveport, and Bossier City.

The anticipated future uses of the streams and lake are the same as the current uses.

2.5 Current and Future Groundwater Use

Groundwater in the drinking water aquifer (250 to 430 ft bgs) near LHAAP is currently used as a drinking water source. The drinking water aquifer should not be confused with the Deep Zone groundwater, which extends only to a depth of approximately 151 ft bgs. The Deep Zone groundwater and the drinking water aquifer are distinct from each other, and there is no connectivity between the contaminated zone and the drinking water aquifer. There are five active water supply wells near LHAAP that are completed in the drinking water aquifer. One well is located in and owned by Caddo Lake State Park. The well is completed to a depth of 315 ft bgs and has been in use since 1935. A second well owned by the Karnack Water Supply Corporation services the town of Karnack and is located approximately 2 miles southeast of town. This well is completed to approximately 430 ft bgs and has been in use since 1942. The Caddo Lake Water Supply Corporation has three wells located both north and northwest of LHAAP. These wells are identified as Caddo Lake Water Supply Corporation Wells 1, 2, and 3, and all are hydraulically upgradient of LHAAP (Jacobs 2002). These wells are completed deeper than the deepest zone of contamination at LHAAP. Because of this and the large distance between these wells and LHAAP, water removal from these wells is not expected to affect groundwater flow at the site. In addition, there are several livestock and domestic wells located in the vicinity of LHAAP with depths averaging approximately 250 ft bgs.

Three water supply wells are located within the boundary of LHAAP itself. One well is located at the Fire Station; the second well is located approximately 0.35 miles southwest of the Fire Station. The third well is located 30 feet east of the USFWS administration building for the Caddo Lake National Wildlife Refuge, near the main entrance to LHAAP. The distances from these water supply wells to LHAAP-17 are approximately 2.2 miles, 2.1 miles, and 2.6 miles, respectively. The three water supply wells were completed at a depth much greater than the zone of contamination described at LHAAP-17. Two additional wells previously supplied water to the installation, but these have been plugged and abandoned. None of these three wells are currently used for drinking water at LHAAP, although they may supply water for non-potable uses.

Although the anticipated future use of the facility as a wildlife refuge does not include the use of the groundwater at LHAAP-17 as a drinking water source, the State of Texas designates all groundwater as potential drinking water, unless otherwise classified, and consistent with 30 TAC §335.563(h)(1). To be conservative, a hypothetical industrial use scenario was evaluated for risk. The future industrial scenario for LHAAP assumes limited use of groundwater as a drinking water source. The selected remedy for LHAAP-17 includes a LUC preventing groundwater use until COC concentrations are supportive of unlimited use and unrestricted exposure.

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3.0 GROUNDWATER EVALUATION

The wells at LHAAP-17 were evaluated in accordance with the PDI Work Plan.

3.1 Groundwater Sampling

Prior to sampling, the depth to water in each well and the total depth were measured to evaluate the need for redevelopment of the wells. There were no indications from the total depth measurements that any wells were silted in or in need of redevelopment. The groundwater elevations are shown in **Table 3-1**. The sampling at LHAAP-17 was conducted from 14-16 Nov 2017 using low flow sampling methods in accordance with the Final Installation-Wide Work Plan (IWWP) (AECOM 2014). The samples were shipped to ALS laboratory services for analysis for perchlorate by EPA Method 6850 and volatile organic compounds (VOCs) by EPA Method 8260C. Sampling was conducted at LHAAP-18/24 from 6-21 Dec 2017 as part of the quarterly evaluation of the groundwater treatment plant (GWTP) (Bhate 2018a). Sample collection logs and laboratory data reports for the LHAAP-18/24 sampling are provided in the referenced report, and the analytical results for selected LHAAP-18/24 wells are included with the LHAAP-17 results on **Table 3-2**. A Shallow Zone groundwater plume map is shown as **Figure 3-1**. Sample collection logs from the LHAAP-17 sampling are provided in **Appendix A**. Based on the results of the November 2017 sampling, there were no concentrations exceeding the cleanup levels detected in the Intermediate or Deep Zones.

During the evaluation of the groundwater sampling results at wells 17WW11 and 17WW12, it became apparent that the well markings in the field (and subsequently those shown on sampling data going back to at least the 2009 sampling) were incorrect relative to the installation records. At the time they were installed in 1998, 17WW11 was shown as an Intermediate Zone well with a depth of approximately 46 ft bgs, and 17WW12 was shown as a shallow well with a depth of approximately 15 ft bgs. During the 2017 sampling event, well 17WW11 was recorded as dry by the sampling team, with a total depth of approximately 18 ft and 17WW12 was sampled and showed a total depth of approximately 49 ft. Further research revealed a similar pattern in samples collected from 2009 and 2010. Subsequent examination and re-measurement of the well depths revealed that the wells had been labelled incorrectly in the field after installation and sample results had been recorded incorrectly in 2009, 2010, and 2017. The well identifications were switched to accurately reflect their installation depths in the analytical database, and they are shown correctly on the attached analytical data tables and maps. The impact of this switch was to remove the previously shown detection of perchlorate at 990 micrograms per liter (µg/L) in the Intermediate Zone at 17WW11 in 2009 and instead show the detection in shallow well 17WW12.

VOC concentrations have decreased at all wells except for the Shallow Zone wells 17WW01 and 17WW06. The perchlorate concentrations have declined in all wells except at Shallow Zone 17WW06, where it increased. The overall size of both plumes has shrunk slightly. The highest perchlorate and VOC concentrations are located at 17WW01 and 17WW06. Given the westerly groundwater flow direction in the Shallow Zone depicted on **Figure 2-1**, a new well west of 17WW06 was proposed to bind the western edge of the shallow perchlorate and VOC plumes. The results from the November 2017 sampling are included in **Table 3-2**. Perchlorate was detected at well 18WW10 located approximately 900 ft north of the site. Based on the potentiometric surface contours indicating a westward groundwater flow direction (shown on **Figure 2-1**), and the lack of perchlorate detections in cross-gradient wells 17WW12 and 17WW20; the detection at 18WW10 is believed to be related to LHAAP-18/24. Wells MW-10 and MW-17 to the east of 18WW10 are sampled as part of the semiannual sampling associated with LHAAP-18/24. Even though these wells did not have perchlorate detections in November 2017, perchlorate was detected in samples from MW-10 in 2013, 2014, 2015, and 2016 at concentrations up to 156 µg/L. Perchlorate was also detected in MW-17 in samples from 2013, 2014, and 2015 at concentrations up to 24.4 µg/L.

3.2 New Well Installation and Sampling (Dec 2017 and April 2018)

Following the evaluation of the November 2017 sampling data, it was apparent that a well was needed to the west of 17WW06 in the Shallow Zone. TCEQ and EPA concurred with the proposed location, 17WW19, in the Shallow Zone as shown on **Figure 3-2**. The new well, 17WW19, was installed on 15 Dec 2017 using a CME-75 hollow stem auger rig and 10.25-inch outside diameter augers to a depth of 25 ft bgs. The well was constructed with 15 ft of 4-inch inside diameter schedule 40 polyvinyl chloride (PVC) 0.010-inch slotted screen. A 15-foot screen was used instead of the 10-foot screen indicated in the PDI Work Plan to fully extend across shallow saturated zone observed in the boring. The remaining casing was 4-inch diameter schedule 40 PVC to a height of approximately 3 ft above ground surface. The annular space around the screen was filled with 20/40 sand filter pack to 2 ft above the top of the screen. A 2-foot bentonite seal consisting of bentonite chips was placed in one lift and allowed to hydrate for 2 hours prior to tremie grouting the remaining annular space with Portland cement/bentonite grout. Due to excessive rainfall making the site inaccessible, the well pad was not placed until 13 Jan 2018, when the well was also developed using a submersible pump with gentle surging. The boring log, well construction, and well development form for 17WW19 are included in **Appendix B**.

The well was sampled on 15 Jan 2018 in accordance with the IWWP (AECOM 2014) using low-flow sampling and submitted to the laboratory for analysis for perchlorate by EPA Method 6850 and VOCs by EPA Method 8260C. The sample collection log is included in **Appendix A**. The results are included in **Table 3-2**.

Based on the analytical results of a sample collected on 15 Jan 2018 no COCs were detected in 17WW19 and the plume is bounded to the west.

It was also noted when assessing the dry condition of monitoring well 17WW12, that the well was installed with a screened interval higher than other nearby wells in the shallow zone and that the boring log from adjacent intermediate well 17WW11 showed an additional sandy interval slightly deeper than the bottom of 17WW12. An additional well, 17WW20, was installed on 26 Apr 2018 at a depth of 28 ft (approximately 11 ft deeper than 17WW12) using a CME-75 hollow stem auger rig and 10.25-inch outside diameter augers. The well was constructed with 10 ft of 4-inch inside diameter schedule 40 PVC 0.010-inch slotted screen. The remaining casing was 4-inch diameter schedule 40 PVC to a height of approximately 3 ft above ground surface. The annular space around the screen was filled with 20/40 sand filter pack to 2 ft above the top of the screen. A 2-foot bentonite seal consisting of bentonite chips was placed in one lift and allowed to hydrate for 2 hours prior to tremie grouting the remaining annular space with Portland cement/bentonite grout. The boring log and well construction diagrams for 17WW20 are included in **Appendix B**. The well was sampled on 8 May 2018 in accordance with the IWWP (Bhate 2018b) using low-flow sampling and submitted to the laboratory for analysis for perchlorate by EPA Method 6850 and VOCs by EPA Method 8260C. The sample collection log is included in **Appendix A**. The results are included in **Table 3-2**.

3.3 Current Extent of COCs in Groundwater (Feb 2018)

Based on the data from the November 2017 and January 2018 sampling, it appeared the Shallow Zone plumes (VOCs and perchlorate) are bounded.

However, because well 17WW12 was dry in November 2017, the water level was checked at later dates in an attempt to collect a Shallow Zone sample from this well. After significant rainfall in late December and January, a sample was collected on 15 Feb 2018. Sample collection log is included in **Appendix A**. All COC concentrations were below the detection limits in the February 2018 sample. Subsequent installation and sampling of a deeper shallow zone well at 17WW20 adjacent to 17WW12 showed all COC concentrations below the detection limits except for trichloroethene (TCE), which was detected at 1.6 µg/L, below the cleanup level of 5 µg/L.

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4.0 SOIL INVESTIGATION

From 11-15 Jan 2018, field activities were conducted to collect the soil samples identified in the PDI Work Plan (AECOM 2016), to refine the areas of soil contamination previously detected at the site that will require excavation and off-site disposal. The following sections describe the activities performed and provide a brief discussion of the analytical detections.

4.1 Soil Sample Rationale

As described in the PDI Work Plan (AECOM 2016), the existing data do not adequately define soil contamination within the site or in the vicinity of the site boundary for explosives (2,4-DNT, 2,6-DNT, and 2,4,6-TNT), barium, and dioxins. As described in the PDI Work Plan, there are three purposes for collection of additional data at the site as described below:

1. Additional soil samples were collected around known “hot spots” to refine the areas of soil contamination. “Hot spots” were defined as locations where site contaminant concentrations in soil exceed the human health cleanup goals and/or ecological risk-based cleanup levels for the site that were identified in the Final ROD (Shaw 2016). Deeper samples were also collected at previous sampling locations where contamination was documented, but the vertical extent was not determined (i.e., the deepest borehole sample collected had concentrations of site contaminants above the cleanup levels).
2. No usable data for 2,4-DNT, and 2,6-DNT exist in the southwestern quadrant of the site, which correlates with the locations of two former burn pits and part of a former surface burn area (see **Figure 1-3**). The USEPA determined that the analytical results for 2,4-DNT, and 2,6-DNT in previously collected soil samples from 17 locations at the site were unusable for environmental decisions (Jacobs 2001). Because the results from these samples were deemed unusable, the sampling locations are not included as historical locations on **Figure 4-1**. Samples for the PDI were collected at 18 locations in the southwestern quadrant of the site and analyzed for explosive compounds to determine the extent of any explosives-contaminated soil present.
3. Most of the historically reported DNT detection limits were higher than the groundwater medium-specific concentration for industrial use (GWP-Ind) of 0.042 mg/kg. Therefore, re-sampling of previously non-detect locations was conducted using an analytical method capable of achieving detection limits below the GWP-Ind, so the results could be used to refine the area requiring excavation.

4.2 Sample Collection Activities

The sample locations, sample intervals, and analysis were defined in the PDI Work Plan. The following summarizes the sample collection activities conducted.

4.2.1 Locations and Sample Intervals

The design and criteria for sample locations and analysis were specified in the PDI Work Plan. Table 3-1 of the PDI Work Plan specified 75 step-out sample locations, 15 re-sample locations, and 18 new locations in the southwest quadrant. The locations from the PDI Work Plan were marked, and there were no deviations from the planned sampling locations. The sample locations are shown on **Figure 4-1** and summarized on **Table 4-1**. The following discusses the plan and the execution of the sampling activities and analysis.

- The lateral step-out distance from locations exceeding the human health cleanup value was 20 ft. The specified 20-foot lateral step-out locations were marked and samples collected from the intervals as described in the PDI Work Plan. However, five of the sample locations to be collected as step-out or vertical refinement samples for human health exceedances were located in an area of standing water that made them inaccessible for sample collection (**Figure 4-2**). The samples from these locations were to be analyzed for 2,4-DNT and 2,6-DNT. Samples from the inaccessible locations will be collected as soon as conditions allow, and the results will be incorporated into the forthcoming RD, if available.
- The step-out distance from 5 locations where ecological criteria were exceeded was 15 ft because the potential mechanism of contaminant transport at these locations is likely by surface transport carrying contaminants from the source area, and the lateral extent of soil contamination is expected to be smaller. The 15-foot lateral step-out locations were marked. However, due to standing water on the ground surface from January to present, 8 of the 20 planned ecological step-out sample locations at the northeastern edge of the site that were included in the PDI Work Plan were not sampled (**Figure 4-2**). The samples from the 8 inaccessible ecological step-out locations were to be analyzed for barium. Samples from the inaccessible locations will be collected as soon as conditions allow, and the results will be incorporated into the forthcoming RD, if available.
- Samples collected on fifty-foot grid centers (18 locations) were specified for sampling of the southwestern quadrant to the west of Scudday Avenue and south of 17WW-01. Samples were collected at 0 to 2 ft bgs, 2.5 to 4.5 ft bgs, and 5 to 7 ft bgs. The work plan called for the 0 to 2 ft bgs samples to be analyzed first while placing the analysis of the other samples on hold deeper samples were to be analyzed based on the analytical results from shallower intervals. The 18 locations based on the 50-foot

grids were marked as indicated in the PDI Work Plan, and samples were collected from all depth intervals of all 18 locations specified in the work plan. The sample analysis of deeper intervals was not marked as hold. Thus, samples from all intervals collected were analyzed, and the results are included in this report.

- Three locations existed where pairs of hot spots were located 30 ft or less from each other and the step-out locations were set at 30 ft or more from the mid-point between the pairs. The 30-foot step out locations were marked around these three locations (7SB02/17SS22; 17SB03/17SS29; and COE17-15/17SB06), and samples were collected as indicated in the PDI Work Plan.
- The PDI Work Plan indicated an adjustment to the spacing where there was a known clean sample location within 40 ft of a hot spot, soil samples will be collected from the midpoint. For example, proposed location 17SS73 is 15 ft from hot spot 17SB01 and is the mid-point between 17SB01 and a clean sample location 17SS26. The spacing specified in the PDI Work Plan was used to mark the sample locations and collect the samples.
- If a hot spot was not fully delineated vertically with a clean soil sample at the final depth, the PDI Work Plan indicated this as a re-sample location by the suffix “A” after the original locations identification numbers. These location were to have samples collected at deeper intervals because the deepest interval sample had detection limits exceeding the cleanup standards or previously was contaminated. Collection of deeper sample intervals ranged from 7 to 14 ft bgs. All intervals were sampled as specified in the PDI Work Plan. The PDI Work Plan called for the deeper intervals to be placed on hold and analyzed based on shallower results. None of the deeper intervals were indicated with a hold on the chain of custody, and all intervals were analyzed.

It should be noted that the groundwater elevation at the time of sampling was approximately 7 ft bgs. Thus, any sample results from intervals that were spanned or fell below the groundwater interface are not discussed further as those results are not indicative of vadose zone soils. The soil analytical results are provided on **Table 4-2** through **Table 4-4**.

4.2.2 Collection Methods

The samples were collected in accordance with the *Collection and Field Screening of Soil Samples* Standard Operating Procedure included as Appendix C, Attachment 1 of the IWWP (AECOM 2014). Samples were collected using a combination of surface soil grab sampling, hand auger sampling, and direct-push technology (DPT) sampling. Samples from 0 to 0.5 ft bgs were collected as grab samples using a stainless steel trowel decontaminated between each sample location. Samples from 0.5 to 5 ft bgs were collected using a stainless steel hand

auger. A grab sample was collected from each interval to be sampled. The sampling tools were decontaminated with an Alconox and water wash followed by a potable water rinse between each sample location and interval. Samples deeper than 5 ft bgs and samples from less than 5 ft bgs at locations where additional deeper samples were planned were collected using DPT. The sample from each interval to be analyzed was collected as a grab sample directly from the DPT sample liner. The sampling tools and DPT sampler were decontaminated between each sample location and interval. Sample collection logs for each sample are provided in **Appendix A**. The investigative-derived waste soil cuttings were placed and stored in drums on-site. Water used for decontamination was transported to the LHAAP 18/24 GWTP for treatment and disposal.

4.2.3 Sample Analysis

The methods for sample analysis were specified in the PDI Work Plan. The following describes the specified analytical methods, and the analytical methods used for the analysis of the collected samples.

- **Dioxins.** The PDI Work Plan specified EPA Method 1613 to be used for dioxins. However, the previous IWWP (AECOM 2014) did not include a method for dioxins and applicable quality assurance procedures. The current Bhate IWWP (Bhate 2018b) was in draft form at the time of sampling, and includes the use of EPA Method 8290 for dioxins. EPA Method 8290 and EPA Method 1613 use the same methodology (gas chromatography–mass spectrometry), and APTIM confirmed with the laboratory that EPA Method 8290 could achieve detection limits below the applicable ecological cleanup level for 2,3,7,8-TCDD, which is the only dioxin compound identified as a site contaminant in the ROD. EPA Method 8290 was used to analyze the soil samples for dioxins. The IWWP has been finalized with EPA Method 8290 for dioxins (Bhate 2018b).
- **Barium.** The barium analysis method specified in the work plan and used for the analysis of the soil samples was EPA Method 6020.
- **Explosives.** The work plan called for the use of EPA Method 8095 due to the need to be sure that the detection limits were below the cleanup levels. However, EPA Method 8095 is typically used as a mobile lab method. EPA Method 8330 is the more widely used method in fixed laboratories and was the method identified for explosives in the IWWP in place at the time (AECOM 2014) as well as the current Bhate IWWP (Bhate 2018b). APTIM confirmed with the laboratory (ALS) that they would be able to achieve detection limits below the cleanup levels using EPA Method 8330 prior to collecting the samples. EPA Method 8330 was used to analyze the explosive samples.

4.3 Analytical Results

4.3.1 Dioxins (EPA Method 8290)

Four sample locations (17SS79 to 17SS82) approximately 15 ft from previous sample location 17SD12 were sampled from 0 to 0.5 ft bgs and analyzed for dioxins by EPA Method 8290 (**Figure 4-1**). The 2,3,7,8-TCDD TEC values for all four samples were below the ecological cleanup value of 4×10^{-6} mg/kg. The results of the dioxin analysis are shown on **Table 4-2**. The maximum detected 2,3,7,8-TCDD TEC value was 5.75×10^{-7} mg/kg in sample 17SS81-0.0-0.5.

4.3.2 Barium (EPA Method 6020)

Twelve step-out samples were collected from 0 to 0.5 ft bgs around three prior sample locations (17SD07, 17SD08, and 17SD12) where the barium concentration was above the ecological cleanup values. The sample locations were numbered 17SS48 to 17SS55 and 17SS79 to 17SS82 (**Figure 4-1**). Samples were not collected around 17SD04 or 17SD11 due to the standing water at the sample locations. Samples were analyzed for barium by EPA Method 6020. The concentrations at three of the 12 locations (17SS50, 17SS54, and 17SS55) exceeded the barium ecological cleanup level from the ROD (222 mg/kg). The maximum concentration (5,760 mg/kg) was detected at 17SS55. Soil excavation confirmation sampling will be included in the RD as part of the proposed excavation activities in these three areas to confirm that the barium concentrations exceeding the ecological cleanup value are removed. Barium analytical results are shown on **Table 4-3**.

4.3.3 Explosives (EPA Method 8330)

Samples collected to refine the area impacted by explosives consisted of 165 soil samples from 79 locations at various depth intervals. The samples were all analyzed for explosives (2,4-DNT, 2,6-DNT, and 2,4,6-TNT) by EPA Method 8330. The PDI Work Plan indicated that only some of the locations were to be analyzed for all three explosive with only select locations requiring analysis for 2,4,6-TNT. However, the chain of custody forms did not distinguish the analytical suites for the various samples and all the samples were analyzed for the three LHAAP-17 explosives COCs (2,4-DNT, 2,6-DNT, and 2,4,6-TNT) instead of the more limited list of analytes in the work plan. All three results have been included in the report and shown on **Table 4-4**. At the locations where 2,4,6-TNT was inadvertently analyzed, 2,4,6-TNT was only detected above the cleanup level at locations that also contain either 2,4-DNT or 2,6-DNT above the cleanup level.

The analysis indicated that 36 samples from 33 sample locations from above 8 ft bgs had one or more explosives compounds detected at a concentration exceeding the human health cleanup levels from the Final ROD (AECOM 2016). **Table 4-4** provides a summary of the explosives analytical data. Of the 36 samples with exceedances, only six sample intervals were greater than 2 ft bgs and above the water table. These six sample intervals represent five

locations. At each of the locations, there was a sample with results below the cleanup level collected from a deeper interval. The remaining detections exceeding the cleanup levels were in samples from 2 ft bgs (or less). All of the samples collected from the new locations in the southwestern quadrant (17SS109 through 17SS126) were below the detection limits for all three explosives analytes.

The highest explosives concentrations were detected at 17SS108 (0 to 2 ft bgs) in the southeastern portion of the site (9,970 mg/kg 2,4,6-TNT), 17SS87 (0 to 2 ft bgs) in the southern portion of the northwestern quadrant (1,480 mg/kg 2,4,6-TNT), and at 17SS60 (0 to 2 ft bgs) in the northern portion of the northwestern quadrant of the site (329 mg/kg 2,4,6-TNT). In general, the concentrations are clustered in the northwest and southeast quadrants of the site. Soil excavation is planned in these areas, and excavation confirmation samples will be included in the RD to confirm the contaminated soil was removed.

4.4 Conclusions

APTIM completed the soil sample collection at 80 of the 93 locations. Thirteen locations in the northeastern part of the site were under water and inaccessible for sampling for barium and 2,4-DNT/2,6-DNT. Since January 2018, these locations have continued to be inaccessible. The inaccessible locations will be sampled as soon as site conditions allow and the data will be incorporated into the RD, if the results are available at the time it is prepared.

There are areas to the north of the sampled locations in the northwest quadrant and south/east of the sampled locations in the southeastern quadrant where soil contamination was not completely delineated. However, these areas approach the boundaries of the historical operations (burning and flashing pits) where surface contamination would be expected and any concentrations in those areas exceeding the cleanup levels are unlikely to extend very deep based on the available data from those areas. Therefore, no additional sampling is planned in these areas and the RD will include excavation confirmation sampling to confirm the contaminated soil was removed.

5.0 AQUIFER PUMPING TEST

An aquifer-pumping test was conducted at LHAAP-17 beginning on 19 Jan 2018, and concluding on 27 Jan 2018. The aquifer-pumping test was performed following the PDI Work Plan (AECOM 2016) and consisted of 1) installation of three new piezometers; 2) a period of ambient monitoring; 3) a step-drawdown test; 4) a constant-rate test; and 5) a recovery test as described in more detail in the following sections. The aquifer-pumping test was conducted to evaluate aquifer and pumping well properties that will provide a basis for the design (capture area, design pumping rates, piping requirements, etc.) of the groundwater recovery system specified as part the selected remedy in the ROD (Shaw 2016). Monitoring Well 17WW02 was used as the primary pumping well and wells 17WW01 and 17WW06 were used as supplemental pumping locations at the end of the constant-rate pumping test. Three piezometers were installed and developed near 17WW02, as described below, prior to initiating the test.

5.1 Piezometer Installation and Development

The design of the piezometers and distances from 17WW02 was provided in the PDI Work Plan and was intended to provide monitoring locations during the test that would show early drawdown in response to pumping at 17WW02. Three piezometers (17PZ01, 17PZ02, and 17PZ03) were installed in December 2017 using hollow stem augers at distances of 10 ft, 20 ft, and 90 ft from the planned pumping well (17WW02) in the configuration described in Section 3.4.2 of the PDI Work Plan text to provide monitoring locations in two directions from the pumping well at a 90 degree angle to each other within the expected cone of depression. The PDI Work Plan called for the piezometer installation depth of 34 ft bgs with a 20-foot screen length from 14 to 34 ft bgs. Well 17WW02 was screened from 10 to 22 ft bgs, and the depth to water observed during the installation of the piezometers was ~11 ft bgs. Based on the lithology observed at the time of installation of the piezometers, the silty clay observed at 17WW02 at approximately 22 ft bgs was encountered at deeper depths between 24 to 30 ft bgs at the piezometer locations. 17PZ01 and 17PZ02 were set at 30 ft bgs with 20-foot screen. The piezometer, 17PZ03, is the farthest from 17WW02 and the silty clay was encountered at a depth of 24 ft bgs. Thus, 17PZ03 was set at the shallower depth of 24 ft bgs with a 15-foot screen. In order to avoid breaching the clay layer and potentially allowing shallow contamination near 17WW02 to migrate deeper, piezometers were completed with the bottom of the screen at 24 ft (17PZ03) or 30 ft (17PZ01 and 17PZ02) with 15 or 20-foot long screened intervals. The piezometers were constructed using 2-inch diameter Schedule 40 PVC risers with 2-inch diameter 0.010-inch slot PVC screens.

The piezometers were designed with screen lengths equal to the saturated thickness of the water-bearing zone at each location. A filter pack consisting of 20/40 screened sand was placed

around the screen and to approximately 2 ft above the top of the screen, and was sealed using 2 ft of bentonite chips placed in 12-inch lifts and hydrated. The bentonite seal was allowed to hydrate for a minimum of 2 hours prior to placing a cement/bentonite grout in the remaining annular space to approximately 6 inches below the ground surface. The piezometers were completed above grade with protective steel casing and 4-foot-by-4-foot concrete pads. After approximately 48 hours, the piezometers were developed by gentle surging with a pump to remove fine-grained material from the well and filter pack. The piezometer locations and elevations were surveyed by a licensed Texas surveyor. Boring logs, well completion forms, and development records for the piezometers are included in **Appendix B**.

5.2 Transducer Placement

To monitor water levels, data logging pressure transducers were placed into each well identified on **Table 5-1** and connected to a central In-Situ Virtual Troll Net Hub™ (central hub) located near 17WW02. The transducers used were vented In-Situ Level Troll 700™ units rated for 30 pounds per square inch gauge pressure. The central hub was used to program the transducers in each well collectively for each test and to monitor the water levels in each well in real-time throughout the performance of the tests. The depth of placement of each transducer was approximately 2 ft above the bottom of the piezometers/observation wells. In the pumping wells the pump intake was approximately 2 ft above the bottom of the well, the transducer was placed approximately 2 ft above the top of the pump to prevent water entering the pump intake from jostling the cable where it passed the pump intake in the well and to allow the pump to be as low as possible in the well to maximize available drawdown. After placement of the transducers in the wells, the water levels were allowed to equilibrate for at least 30 minutes and then programmed with a reference level corresponding to the depth of the water over the transducer that was measured in each well with a water level meter after equilibration to establish the reference level of each transducer.

5.3 Ambient Monitoring

To establish the range of natural static water levels and magnitude of water level fluctuations, water levels were monitored for approximately 60 hours from 19-22 Jan 2018. The Troll transducer data from the ambient monitoring was recorded as depth of water measurements and was converted after the test to depth to water measurements to match the readings recorded during the subsequent tests. For the ambient monitoring, the transducers were programmed to record a water level measurement every 5 minutes. The ambient data was collected for approximately 60 hours. Plots of the ambient depth to water data from each well are included in **Appendix D**, and the data files are included in electronic form on CD in **Appendix E**. Barometric pressure readings were not collected as indicated in the PDI Work Plan because the transducers and cables used were vented; therefore, the barometric pressure differential in the transducer was maintained and correction of the data is unnecessary.

Table 5-1
Aquifer Pumping Test Monitoring Network Locations

Well ID	Monitoring Purpose	Well Diameter (Inches)	Distance from Pumping Well (feet)
17WW02	Pumping Well	4	0
17PZ01	Piezometer	2	10
17PZ02	Piezometer	2	20
17PZ03	Piezometer	2	90
17WW01	Observation/Pumping Well	4	162
17WW06	Observation/Pumping Well	4	180
130	Observation Well	4	130
MW-8	Observation Well	4	600

5.4 Step-Drawdown Test

The step test was conducted to identify a pumping rate that will 1) stress the aquifer sufficiently to create measurable drawdown in nearby piezometers/observation wells and 2) achieve steady state conditions in approximately 24 to 48 hours.

5.4.1 Test Preparation

After the ambient monitoring, the transducers were removed from the three pumping wells, and the pumps were placed in the wells approximately 2 ft from the bottom of the well. The transducers were then placed back into the pumping wells approximately 2 ft above the pump. This configuration allowed the pump to be placed as deep as possible in the well and minimized jostling the transducer cable (to prevent erroneous water level readings) when water was flowing into the intake at the bottom of the pump. With this configuration, the transducer was still set at a depth well below the anticipated maximum 7-foot drawdown. After placement of the pumps and transducers into the wells, the wells were allowed to equilibrate for approximately 4 hours. The transducers were calibrated to the actual water level (depth below top of casing) using manual measurements collected immediately prior to initiating the step test. The Troll Net Hub was connected to a laptop running the In-Situ Virtual Hermit software and each transducer was triggered to begin recording simultaneously at the beginning of the step test.

The step-drawdown test was conducted to determine a suitable pumping rate to be used in the constant-rate pumping test. A 2-inch diameter Grundfos Redi-Flo 2 pump with a variable speed controller was used in the pumping well, 17WW02. Electricity was supplied to the pump by a

diesel-powered generator. Combined electronic flow meters with totalizers were installed on each well. However, because of the very low flow rates used, the meters did not provide accurate flow readings. A graduated cylinder and stopwatch were set up and used to measure flow output at least every 30 minutes throughout the test.

5.4.2 Conducting the Step Test

The step test was run with 4 pumping rate steps (0.1 gallons per minute [gpm], 0.25 gpm, 0.5 gpm, and 0.7 gpm). Groundwater level readings were collected every 10 seconds throughout the test. A water level meter was also used to visually compare the depth to water in the pumping well with the readings being recorded by the transducer approximately every 5 minutes during the step test.

The first step consisted of pumping at a rate of 0.1 gpm for 37 minutes, with the aquifer stabilizing at a drawdown of 2.01 ft. For the second step, the rate was increased to 0.25 gpm for 23 minutes, stabilizing at 3.17 ft of drawdown. The rate for the third step was increased to 0.5 gpm for 24 minutes, with the drawdown stabilizing at 6.27 ft below the static water level. The pumping rate for the fourth step was 0.7 gpm, and ran for 50 minutes before the step test was terminated due to excessive drawdown. The transducer in 17WW02 was placed at depth of approximately 20 ft (~10 ft below the static water level), and the step test was terminated with the depth to water in the well reached 18.5 ft with no sign of stabilizing.

After the pump was turned off, the water levels in 17WW02 and the surrounding piezometers were monitored until the piezometers returned to their static water levels and the pumping well recovered to greater than 90% of the static water level. **Figure 5-1** shows a plot of the drawdown and recovery in 17WW02 during the step test.

5.5 Constant-Rate Test

5.5.1 Test Setup

The drawdown versus time for each step shown on **Figure 5-1** was used to calculate the specific capacity (Q/s) for each step (**Table 5-2**). The pumping rate selected from the step test was 0.25 gpm based on a goal of achieving at least 2 ft of drawdown at the pumping well, but not more than 7 ft to protect the transducer placement and pump intake. During the step test, the 0.25 gpm step produced 3.17 ft of drawdown at the pumping well.

The constant-rate test was conducted using 17WW02 as the initial pumping well, and seven additional wells (17WW01, 17WW06, 17PZ01, 17PZ02, 17PZ03, 130, and MW-8) as observation wells. The PDI Work Plan also included the use of 17WW01 and 17WW06 as pumping wells once equilibrium was achieved in the observed drawdown from pumping at 17WW02. The observation wells were each equipped with a Level Troll connected to the Net Hub and readings were collected at a rate of one reading per second for the duration of the

constant-rate test. 17WW01 and 17WW06 were also equipped with pumps and tubing connected to the on-site storage tank, allowing them to be used for additional pumping wells once equilibrium was reached in 17WW02 and the surrounding piezometers.

5.5.2 Conducting the Test

The constant-rate test was initiated after full recovery was observed in all observation wells. Flow measurements were collected every 15 minutes for the first 6 hours, then every 30 minutes for the next 6 hours, then hourly for the remainder of the test. The water levels in the wells were measured manually every 60 minutes to verify the depth to water readings being recorded by the Trolls. Field measurements are tabulated in **Table 5-5**. A water level tape was placed in the pumping well and set approximately 0.10 foot above the current water level after each manual measurement to act as a high-level alarm in case the pump flow decreased unexpectedly.

Pumping began from 17WW02 at 0.25 gpm. Drawdown in the pumping well (17WW02) and the piezometers (17PZ01, 17PZ02, and 17PZ03) achieved equilibrium after approximately 48 hours of pumping, and the pumps in 17WW01 and 17WW06 were turned on and set to pump at the same approximate 0.25 to 0.3 gpm rate. **Figures 5-2 through 5-5** show the time versus drawdown curves from 17WW02, 17PZ01, 17PZ02, and 17PZ03 respectively.

Based on the observed initial small drawdowns and rapid equilibrium drawdowns reached at 17WW01 and 17WW06, it became apparent after several hours of pumping that both wells were capable of producing much higher volumes than 17WW02. After ~16 hours of pumping at 0.3 gpm from each well, the pumping rates in 17WW01 and 17WW06 were increased to 1.0 gpm. After another 6 hours, 17WW01 was increased to 1.25 gpm and 17WW06 was increased to 1.5 gpm. The pumps ran at this rate for another 2 hours. The pumping rates for each of the wells are shown on **Table 5-5**. The combined constant-rate test was run for a total test time of 72 hours. The evaluation of the constant-rate test data are discussed in **Section 5.8**. Plots of the time versus drawdown for each of the wells are provided in **Appendix D**.

5.6 Recovery Test

The pumps in all three wells were shut down after 72 hours of pumping. Water level data was recorded for 16 hours when the water level returned to at least 90% of the pre-test static water levels in all wells. The tubing was sealed as the pumps were shut down to prevent backflow of the water down the tubing that would mask the initial recovery in the pumping wells. The data-sampling rate for the recovery period was one reading per second to ensure the early part of the recovery was adequately captured. Once it was verified that all wells had recovered to within 90% of the pre-test static water levels, data recording was discontinued, and all

equipment was removed from the wells. Recovery graphs showing the data from each of the wells during the recovery period are included in **Appendix D**.

5.7 Site Restoration

The transducers and pumps were removed from the wells, and the wells were closed up. Groundwater produced during the tests was held in a 6,000-gallon portable tank during the tests. Based on the volumes pumped by each well during the constant-rate test, approximately 2,700 gallons of water were pumped into the storage tank. Stored discharge water was periodically transferred to a 2,000-gallon water truck and transported to the GWTP for treatment. After all the water was transported to the GWTP, the remaining equipment was removed from the site.

5.8 Data Evaluation

The AquiferTest software package from Waterloo Hydrogeologic (similar to AQTESOLV™) was used to evaluate the data collected to calculate the Hydraulic Conductivity (K), Transmissivity (T), and Storativity (S); and to prepare graphics depicting the conditions observed in the tests and used to calculate the parameters listed above. In general, for unconfined aquifers, the Storativity is a good estimation of the specific yield, as the specific storage is several orders of magnitude lower.

5.8.1 Ambient Monitoring

The transducers were set to record ambient water level readings in all wells over a weekend. Recording started on Friday afternoon and was stopped on Monday. The ambient recording period captured approximately 64 hours of data from each well. A combined plot of the ambient data (**Figure 5-6**) shows moderate fluctuations of less than 1/10th of a foot in all of the wells. Individual plots of the data in each well are included in **Appendix D**. There is a pattern of disturbance in MW-8 that appeared each day at approximately 7:00 a.m. and lasted until approximately 4:00 to 5:00 p.m. in the ambient monitoring data as well as the constant-rate test data. The data became noisier during that time period, with wider fluctuations in the water level. Due to the length of the cable connecting this location to the net hub, the pattern may be signal noise impacting the transmission of readings or may represent impacts from operation of the nearby LHAAP-18/24 recovery system.

5.8.2 Step-Drawdown Test

The drawdown and discharge from the pumping well was plotted to determine the specific capacity, well discharge per unit of drawdown expressed as gallon of water per minutes per foot, or gpm/ft). A plot of drawdown annotated with the discharge for each step is provided in **Figure 5-1**. **Figure 5-7** shows the maximum drawdown for each step plotted against the pumping rate. The AquiferTest specific capacity analysis indicates a Q/s at 17WW02 of

0.01235 square ft per minute (equal to 0.0924 gpm/ft) for the step test pumping rate values at 17WW02 as shown on **Figure 5-8**. **Table 5-2** provides the specific capacity from each step of the step test. This confirms that the 0.25 gpm pumping rate selected was appropriate for the constant-rate test.

Table 5-2
Step-Drawdown Test Pumping Rates, Drawdown, and Specific Capacities

Pumping Rate (gallons/min)	Drawdown (feet)	Specific Capacity (gallons/min/ft)
0.1	2.01	0.049
0.25	3.17	0.079
0.5	6.27	0.080
Mean		0.069

5.8.3 Constant-Rate Test

The constant-rate test drawdown curves for the observation wells (**Appendix D**) were examined visually for evidence of drawdown related to the pumping at 17WW02. If a drawdown curve that deviated from the fluctuating pattern seen in the ambient monitoring, then the curve was analyzed using AquiferTest. The three piezometers had distinct drawdown curves indicative of impact from the pumping well, 17WW02, while both MW-8 and to some degree well 130 showed a fluctuating pattern with slight drawdown during the day. These fluctuations may be related to signal noise or pumping and/or discharge fluctuations from LHAAP-18/24. There is a slight sign of initial drawdown in well 130, but it is less than 1/10th of a foot and within the range of the ambient fluctuations that were recorded before the test. Thus, no measurable trend related to the pumping could be observed in well 130.

The drawdown curve for the pumping well (17WW02) (**Figure 5-2**) shows a number of “spikes” where the drawdown exhibited transient rebound. These correspond to periods of decreased discharge possibly due to overheating of the pump. In most instances, adjusting the flow rate corrected the discharge rate to ~0.24 gpm within a maximum of 5 minutes from when the rate drop occurred. The issues with potential pump overheating and the addition of pumping from 17WW01 and 17WW06 create somewhat noisy data plots for the constant-rate test in the piezometers.

The drawdown curves for the three piezometers were analyzed using the “Theis with Jacob Correction” option in AquiferTest (**Figures 5-9 through 5-11**). This method uses a Theis curve fit based on a confined aquifer assumption, but uses a Jacob correction to adjust the drawdown data measured in an unconfined aquifer. The correction simulates confined aquifer data in the

absence of delayed yield and fits the Theis curve to the later part of the drawdown curve, when delayed yield is not a large factor (Waterloo Hydrogeologic 2018). Based on evaluation of the three piezometers, the total drawdown prior to the initiation of pumping from 17WW01 and 17WW06 ranged from ~0.20 to 0.42 ft. Following the initiation of the additional pumping from the two additional wells, a slight downward turn in the drawdown curve is visible in all three piezometers, in the final 6-8 hours of the test, which may be indicative of impact from the additional pumping. **Table 5-3** shows the calculated Transmissivity (T), Hydraulic Conductivity (K), and the Storativity (S) specific storage (storage coefficient) from each of the three piezometers based on the constant-rate test evaluation. The Transmissivity and Hydraulic Conductivity are very uniform across the three piezometers, but the Storativity varies over a wider range, which may reflect differences in the thickness of the most transmissive portion of the water bearing zone and variations in the silt and clay content of the transmissive zone, since most of the Storativity measured in an unconfined aquifer is a result of gravity fed dewatering of saturated areas.

Table 5-3
Constant Rate Test Aquifer Parameters

Observation Well	Transmissivity (T) (gallons/day/foot)	Hydraulic Conductivity (K) (feet/day)	Storativity (S) (unitless)
17PZ01	5.67×10^2	4.83	7.75×10^{-6}
17PZ02	5.18×10^2	4.40	3.24×10^{-3}
17PZ03	5.90×10^2	5.02	1.06×10^{-2}
Average	5.58×10^2	4.75	4.62×10^{-3}

The pumping rates in the two additional pumping wells (17WW01 and 17WW06) showed that significantly higher pumping rates are sustainable by these wells. The pumping rates were used as a pseudo drawdown test in each well and demonstrated that pumping rates of 1 gpm or higher may be sustainable in that portion of the site long-term. The potential for higher rates will be evaluated through further data review and integrated into the pumping system design in the RD for LHAAP-17.

5.8.4 Recovery Test

Recovery measurements were collected in each well for a period of approximately 16 hours following shut down of the pumps until full recovery (>90%) was achieved and the recovery leveled off. The recovery data plots for each well are included in **Appendix D**. The data from the three piezometers where significant pumping related drawdown occurred was evaluated using the “AGARWAL + Theis with Jacob Correction” analysis method in AquiferTest. The

Agarwal method (Agarwal 1980) uses the recovery drawdown plotted as instantaneous head / head at the end of the pumping interval against an “equivalent time” axis that is calculated using both the time since pumping began and the time since recovery began (Waterloo Hydrologic 2018). In this case, the Agarwal method creates a recovery curve that is then fitted to a Theis curve for confined aquifers, with the Jacob correction used to correct the unconfined aquifer data collected for comparison to the Theis solutions. Because the Jacob correction is only applicable when delayed yield is not an issue, the Theis curve is fit to the “late-time” data when delayed yield is not a factor.

The plotted solutions for the three piezometers using the Agarwal+Theis with Jacob Correction analysis method are shown on the plots for the three piezometers included as **Figures 5-12** through **5-14**. The solutions plotted provide a calculated Transmissivity (T), Hydraulic Conductivity (K), and Storativity (S) for each recovery data set. The parameters calculated for the three piezometers from the recovery data are shown on **Table 5-4**.

Table 5-4
Recovery Test Aquifer Parameters

Observation Well	Transmissivity (T) (gallons/day/foot)	Hydraulic Conductivity (K) (feet/day)	Storativity (S) (unitless)
17PZ01	2.2×10^2	1.87	2.46×10^{-4}
17ZP02	2.1×10^2	1.78	2.62×10^{-4}
17PZ03	1.83×10^2	1.55	2.87×10^{-4}
Average	2.04×10^2	1.73	2.65×10^{-4}

5.9 Conclusions

The aquifer test was completed successfully from 19-27 Jan 2018. The test was run to obtain additional data for the RD as described in the PDI Work Plan. Previously, a 4-hour pumping test was conducted in 17WW01, 17WW02, and 17WW06 and indicated that the pumping rates ranged from 0.89 to 1.49 gpm (AECOM 2016). The initial step test indicated that these rates could not be sustained from 17WW02. The rates in the constant-rate test ranged from 0.25 gpm in 17WW02 to 1.5 gpm in 17WW01 and 17WW06 when they were pumping. The aquifer recovered in less than 24 hours as expected.

As seen on **Table 5-5**, the Transmissivity (T), Hydraulic Conductivity (K), and Storativity (S) values calculated from the recovery tests were very consistent between all three piezometers, and generally within an order of magnitude of the values calculated from the constant-rate test data as shown on **Table 5-4**. The relatively good agreement between the two sets of calculated

values provides confidence that the values are representative of the area in the vicinity of 17WW02 and may be extrapolated for use elsewhere at LHAAP-17 based on the pumping data collected from 17WW01 and 17WW06. The values calculated based on the recovery data are more consistent and should provide a good basis for designing the pumping system needed to capture and remove the high concentrations of perchlorate present in groundwater in the vicinity of 17WW06 in accordance with the selected remedy in the ROD. Because the late term pumping data from 17WW06 indicates that it may be capable of producing 2 to 3 times the volume of water that was pumped from 17WW02 during the constant rate pumping test, careful consideration and evaluation of the data will be required to develop the optimal pumping system to be presented in the RD.

PRE-DESIGN INVESTIGATION REPORT, LHAAP-17 BURNING GROUND NO. 2/ FLASHING AREA, GROUP 2

Contract No. W9128F-13-D-0012, Task Order No. W9128BV17F0150 • Draft Final • Rev 0 • September 2018

6.0 CONCLUSIONS

APTIM has successfully performed the activities included in the PDI Work Plan as described in the previous sections, except as noted. The data collected are sufficient to begin the preparation of the RD to implement the excavation, pumping, and MNA remedy selected in the ROD. As described in **Section 4.0**, 13 soil sample locations that were inaccessible due to standing water will be sampled as soon as conditions allow. The data from these activities will be incorporated into the RD when they are completed.

PRE-DESIGN INVESTIGATION REPORT, LHAP-17 BURNING GROUND NO. 2/ FLASHING AREA, GROUP 2

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7.0 REFERENCES

AECOM Technical Services, Inc. (AECOM). 2014. *Final Installation-Wide Work Plan*. Longhorn Army Ammunition Plant, Karnack, Texas. July.

AECOM. 2016. *Draft Final Pre-Design Investigation Work Plan, LHAAP-17 Burning Ground No. 2 / Flashing Area, Group 2*. Longhorn Army Ammunition Plant, Karnack, Texas. November.

Agarwal, R. G. 1980. *A new method to account for producing time effects when drawdown type curves are used to analyze pressure buildup and other test data*. Proceedings of the 55th Annual Fall Technical Conference and Exhibition of the Society of Petroleum Engineers. Paper SPE 9289.

Bhate Environmental Associates, Inc. (Bhate). 2018a. *Draft Quarterly Evaluation Report, 4th Quarter (October – December) 2017, Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas*. May.

Bhate. 2018b. *Installation-Wide Work Plan, Longhorn Army Ammunition Plant, Karnack, Texas*.

Jacobs Engineering Group, Inc. (Jacobs). 2001. *Final Remedial Investigation Report for the Group 2 Sites Remedial Investigation (Sites 12, 17, 18/24, 29, and 32) at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas*. April.

Jacobs. 2002. *Remedial Investigation Report Addendum for the Group 4 Sites, Remedial Investigation Report, Sites 04, 08, 67, and Hydrocarbon Study, Longhorn Army Ammunition Plant, Karnack, Texas*. Oak Ridge, Tennessee. February.

Plexus Scientific Corporation (Plexus). 2005. *Final Environmental Site Assessment, Phase I and II Report, Production Areas, Longhorn Ammunition Plant, Karnack, Texas*. February.

Shaw Environmental, Inc. (Shaw). 2016. *Final Record of Decision, LHAAP-17, Burning Ground No. 2/Flashing Area, Group 2, Longhorn Army Ammunition Plant, Karnack, Texas*. August.

U.S. Department of the Army (U.S. Army). 2004. *Memorandum of Agreement Between the Department of the Army and the Department of the Interior for the Interagency Transfer of Lands at the Longhorn Army Ammunition Plant for the Caddo Lake National Wildlife Refuge, Harrison County, Texas*. Signed by the Department of the Interior on April 27, 2004, and the U.S. Army on April 29, 2004.

Waterloo Hydrogeologic. 2018. *AquiferTest Pro Online User Manual*. <https://www.waterloohydrogeologic.com/help/aquifertest/>

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Tables

Table 1-2
Cleanup Levels for Human Health Risk

Medium	Chemical of Concern	Cleanup Level
		MCL (µg/L)
Shallow Zone groundwater	1,1-Dichloroethene	7
	1,2-Dichloroethane	5
	cis-1,2-Dichloroethene	70
	Trichloroethene	5
	Vinyl Chloride	2
		Texas Residential Groundwater PCL (µg/L)
	Perchlorate	17
		MCL (µg/L)
Intermediate Zone groundwater	cis-1,2-Dichloroethene	70
	Trichloroethene	5
	Vinyl Chloride	2
		GWP-Ind (mg/kg)
Soil	2,4,6-Trinitrotoluene	5.1
	2,4-Dinitrotoluene	0.042
	2,6-Dinitrotoluene	0.042
	Perchlorate	7.2

Notes:

µg/L - micrograms per liter

GWP-Ind - Texas Commission on Environmental Quality soil medium specific concentration for industrial use based on groundwater protection

MCL - Safe Drinking Water Act maximum contaminant level

mg/kg - milligrams per kilogram

PCL - protective concentration level

TRRP - Texas Risk Reduction Program

Table 1-3
Cleanup Levels for Ecological Risk in Soil (EcoPRGs)

Chemical	SS EcoPRG ^a (mg/kg)	TS EcoPRG ^a (mg/kg)	Depth ^b	Sample Location
Barium	222	–	0 - 0.5 feet	17SS22, 17SD04, 17SD07, 17SD08, 17SD11
	–	520	0 - 3 feet	17SD07
2,4-Dinitrotoluene	–	12	0 - 3 feet	17SB02
2,6-Dinitrotoluene	2.7	6.8	0 - 3 feet	17SB02
2,4,6-Trinitrotoluene	–	4.7	0 - 3 feet	17SS22, 17SS23, 17SB06
2,3,7,8-TCDD TEC	4×10^{-6}	4×10^{-6}	0 - 3 feet	17SD12

Notes:

^a From Baseline Ecological Risk Assessment Table 16-1 (Shaw 2007b).

^b Depth and locations of remedial action for Waste Sub-Area.

EcoPRG - ecological preliminary remediation goal

mg/kg - milligrams per kilogram

SS - surface soil from 0 to 0.5 feet (applicable to deer mouse)

TCDD - tetrachlorodibenzo-p-dioxin

TEC - toxicity equivalence concentration

TS - total soil from 0 to 3 feet (applicable to short-tailed shrew)

Table 3-1
Groundwater Elevation Summary - November 2017

Location ID	Aquifer Zone	Northing	Easting	Ground Surface Elevation	Top of Casing Elevation	Depth to Water (Nov 2017)	Groundwater Elevation (Nov 2017)
120	Shallow	6953773.67	3316015.12	181.39	184.19	14.10	170.09
130	Shallow	6952823.84	3315814.59	174.94	177.73	9.00	168.73
17WW01	Shallow	6952637.54	3315690.63	176.62	179.01	11.05	167.96
17WW02	Shallow	6952784.79	3315651.12	174.34	177.21	9.00	168.21
17WW03	Shallow	6952651.91	3315789.22	176.39	179.2	11.10	168.10
17WW04	Shallow	6952536.34	3315473.48	177.29	180.21	12.30	167.91
17WW05	Deep	6952644.35	3315436.99	178.8	182.73	14.15	168.58
17WW06	Shallow	6952718.3	3315475.11	176.82	179.36	11.70	167.66
17WW07	Intermediate	6952511.63	3315981.67	176.78	179.68	11.65	168.03
17WW08	Shallow	6952492.98	3315991.09	176.76	179.94	11.45	168.49
17WW09	Intermediate	6952843.2	3315374.47	178.4	181.43	13.65	167.78
17WW10	Shallow	6952842.29	3315390.11	178.38	181.55	13.65	167.90
17WW11	Shallow/ Intermediate	6952970.73	3315572.84	177.51	180.95	12.30	168.65
17WW12	Shallow	6952971.75	3315587.47	177.04	180.32	Dry / 11.63 ^a	168.69 ^a
17WW13	Shallow	6952679.23	3315986.44	175.9	179.14	11.00	168.14
17WW14	Shallow	6952609.79	3315323.86	178.83	181.9	13.95	167.95
17WW15	Intermediate	6952941.24	3315221.445	180.33	182.61	15.15	167.46
17WW16	Deep	6952809.255	3315406.13	178.99	181.13	13.15	167.98
17WW17	Intermediate	6952646.74	3315700.8	176.23	178.81	11.25	167.56
17WW18	Intermediate	6952976.4	3315886.53	176.03	178.68	11.15	167.53
17WW19	Shallow	6952718.36	3315313.67	180.08	176.63	12.55 ^b	164.08 ^b
18WW10	Shallow	6953731.65	3315348.55	178.88	182.36	15.10	167.26
18WW14	Shallow	6952240.15	3315372.09	183.68	186.54	18.70	167.84
18WW15	Intermediate	6952238.35	3315363.51	183.67	186.33	18.45	167.88
C-07	Shallow	6952103.2	3315826.6	194.29	196.8	28.55	168.25
MW-7	Shallow	6953168.69	3316344.53	186.53	188.47	20.34	168.13
MW-8	Shallow	6953275.84	3316038.86	185.5	187.13	18.98	168.15
MW-9	Shallow	6953558.92	3316045.41	182.48	184.73	15.88	168.85
MW-10	Shallow	6953739.74	3315763.68	176.33	178.12	10.70	167.42
MW-16	Shallow	6953959.95	3315784.53	176.91	178.59	11.52	167.07
MW-18	Shallow	6953262.29	3315771.7	177.27	178.58	10.55	168.03
MW-19	Shallow	6952973.45	3316073.5	176.93	178.6	10.49	168.11
MW-20	Shallow	6952855.35	3316545.17	184.64	186.64	12.74	173.90
18CPTMW22R	Shallow	NA	NA	NA	187.23	12.90	174.33

Notes:

^a 17WW12 was dry during the initial sampling event in November 2017. The depth to water and groundwater elevation values are based on the sampling performed on 15 Feb 2018 and are not used in the depiction of the potentiometric surface shown on Figure 2-1.

^b 17WW19 was installed after the November 2017 sampling event. The depth to water and groundwater elevation values are based on the sampling performed on 15 Jan 2018 and are not used in the depiction of the potentiometric surface shown on Figure 2-1.

NA - not available

Table 3-2
Groundwater Analytical Results

	Sample ID		130-111417		17WW01-111517		17WW02-111517		17WW03-111417		17WW04-111617		17WW05-111617		17WW06-111617		17WW07-111417	
	Sample Date		11/14/2017		11/14/2017		11/15/2017		11/14/2017		11/16/2017		11/16/2017		11/16/2017		11/14/2017	
	Location Description		Shallow Zone, impacted, outside site boundary		Shallow Zone impacted, within site boundary		Shallow Zone, impacted, within site boundary		Shallow Zone, impacted, within site boundary		Shallow Zone, unimpacted, outside site boundary		Deep Zone, unimpacted, outside site boundary		Shallow Zone, impacted, outside site boundary		Intermediate Zone, unimpacted, within site boundary	
Parameter	Units	MCL / PCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Perchlorate	µg/L	17	2.5	J	< 4	U	2,500	J	< 4	U	< 4	U	< 4	U	110,000		< 4	U
1,1-Dichloroethene	µg/L	7	< 1	U	240		< 1	U	< 1	U	< 1	U	< 1	U	7.6		< 1	U
1,2-Dichloroethane	µg/L	5	< 1	U	87		3.3		< 1	U	< 1	U	< 1	U	8.4		< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	3,700		2.5		0.7	J	< 1	U	< 1	U	9.4		< 1	U
Trichloroethene	µg/L	5	2.1		6,100	J	6.2		5.3		< 1	U	< 1	U	260		< 1	U
Vinyl Chloride	µg/L	2	< 1	U	4		< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U

Notes:

Blue highlighted results in bold indicate concentrations above the MCL/PCL.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

µg/L - micrograms per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

MCL - maximum contaminant limit

NA - not analyzed

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Val Qual - qualifiers applied by APTIM chemist during data validation.

Table 3-2
Groundwater Analytical Results

	Sample ID		17WW08-111417		17WW09-111517		17WW10-111517		17WW11-111617		17WW12-021518		17WW13-111417		17WW14-111517		17WW15-111517	
	Sample Date		11/14/2017		11/15/2017		11/15/2017		11/16/2017		2/15/2018		11/14/2017		11/15/2017		11/15/2017	
	Location Description		Shallow Zone, unimpacted, within site boundary		Intermediate Zone, unimpacted, outside site boundary		Shallow Zone, unimpacted, outside site boundary		Shallow Zone, unimpacted, within site boundary		Shallow Zone, unimpacted, within Site Boundary		Shallow Zone, unimpacted, within site boundary		Shallow Zone, unimpacted, outside site boundary		Intermediate Zone, unimpacted, outside site boundary	
Parameter	Units	MCL / PCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Perchlorate	µg/L	17	< 4	U	< 4	U	1.6	J	< 4	U	< 4	U	< 4	U	2.5	J	< 4	U
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U
Trichloroethene	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	1.5		< 1	U	< 1	U
Vinyl Chloride	µg/L	2	< 1	U	< 1	U	< 1	U	< 1	U	< 0.5	U	< 1	U	< 1	U	< 1	U

Notes:

Blue highlighted results in bold indicate concentrations above the MCL/PCL.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

µg/L - micrograms per liter

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PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Val Qual - qualifiers applied by APTIM chemist during data validation.

Table 3-2
Groundwater Analytical Results

	Sample ID		17WW16-111517		17WW17-111517		17WW18-111517		17WW19-011518		17WW20-050818		MW7_121317		MW8_121217		MW9_121317	
	Sample Date		11/15/2017		11/15/2017		11/15/2017		2/15/2018		5/8/2018		12/13/2017		12/12/2017		12/13/2017	
	Location Description		Deep Zone, unimpacted, outside site boundary		Intermediate Zone, unimpacted, within site boundary		Intermediate Zone, unimpacted, outside site boundary		Shallow Zone, unimpacted, downgradient of plume		Shallow Zone, outside site boundary		Site 18/24-SW, outside the fence line, along the road surrounding the fence line		Site 18/24-SW, outside the fence line		Site 18/24-WSW, outside the fence line, along the road surrounding the fence line	
Parameter	Units	MCL / PCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Perchlorate	µg/L	17	< 4	U	< 4	U	< 4	U	< 4	U	< 4	U	15,000		5,500		44	
1,1-Dichloroethene	µg/L	7	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 5	U	< 1	U	< 1	U
1,2-Dichloroethane	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	17		4.0		0.82	J
cis-1,2-Dichloroethene	µg/L	70	< 1	U	1.9		< 1	U	< 1	U	< 1	U	11		5.4		70	
Trichloroethene	µg/L	5	< 1	U	< 1	U	< 1	U	< 1	U	1.6		1,600		270		930	
Vinyl Chloride	µg/L	2	< 1	U	< 1	U	< 1	U	< 1	U	< 1	U	< 5	U	< 1	U	< 1	U

Notes:

Blue highlighted results in bold indicate concentrations above the MCL/PCL.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

µg/L - micrograms per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

MCL - maximum contaminant limit

NA - not analyzed

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Val Qual - qualifiers applied by APTIM chemist during data validation.

Table 3-2
Groundwater Analytical Results

	Sample ID		MW10-121117		MW-16_120817		MW17-121117		MW18-121117		MW19-121217		MW20_121417		120_121417		18CPTMW22R	
	Sample Date		12/11/2017		12/8/2017		12/11/2017		12/11/2017		12/12/2017		12/14/2017		12/14/2017		12/14/2017	
	Location Description		Site 18/24-W, outside the fence line, along the outer loop road		Site 18/24-W, outside the fence line, along the road surrounding the fence line		Site 18/24-W, outside the fence line, along the outer loop road		Site 18/24-SW, outside the fence line, along the outer loop road		Site 18/24-SSW, outside the fence line, along the outer loop road		Site 18/24-S, outside the fence line, along the outer loop road		Site 18/24- W, inside the fence line, outer region		Site 18/24-S, outside the fence line, along the outer loop road	
Parameter	Units	MCL / PCL	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Perchlorate	µg/L	17	< 4	U	< 4	U	< 4	U	< 4	U	< 4	U	1.9	J	65,000		8.3	
1,1-Dichloroethene	µg/L	7	< 1	U	3.6		NA		< 1	U	< 1	U	< 1	U	250		< 1	U
1,2-Dichloroethane	µg/L	5	< 1	U	23		NA		< 1	U	< 1	U	< 1	U	110		< 1	U
cis-1,2-Dichloroethene	µg/L	70	< 1	U	13		NA		1.2		3.1		< 1	U	3,900		< 1	U
Trichloroethene	µg/L	5	< 1	U	300		NA		4.8		3.2		< 1	U	27,000		< 1	U
Vinyl Chloride	µg/L	2	< 1	U	< 1	U	NA		< 1	U	< 1	U	< 1	U	260		< 1	U

Notes:

Blue highlighted results in bold indicate concentrations above the MCL/PCL.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

µg/L - micrograms per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

MCL - maximum contaminant limit

NA - not analyzed

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Val Qual - qualifiers applied by APTIM chemist during data validation.

Table 4-1
Soil Sample Summary

Prior Sample Location	New Sample Location	Step-out Distance (feet)	Sample Depth(s) (feet bgs)	Analytes	Basis for Sample Collection
17SD08	17SS48	15	0 - 0.5	Barium	Step-out samples for 17SD08
	17SS49	15			
	17SS50	15			
	17SS51	15			
17SD07	17SS52	15	0 - 0.5	Barium	Step-out samples for 17SD07
	17SS53	15			
	17SS54	15			
	17SS55	15			
17SS21	17SS56	20	0 - 2	2,4-DNT and 2,6-DNT ^b	Step-out samples for 17SS21
	17SS57	20			
	17SS58	20			
	17SS59	20			
	17SS21A	0	0 - 2, 3 - 5, 5 - 7	2,4-DNT and 2,6-DNT ^b	Deeper samples at 17SS21 location
17SB02 and 17SS22	17SS58 ^a	20	0 - 2	2,4-DNT and 2,6-DNT ^b	Step-out samples for 17SS02 and 17SS22
	17SS60	30			
	17SS61	30			
	17SS62	30			
	17SS64	35			
	17SB02A	0	11 - 13 ^c , 13 - 15 ^c	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Deeper samples at 17SS02 and 17SS22
	17SS22A	0	3 - 5, 5 - 7, 7 - 9 ^c		
17SS23	17SS63	20	0 - 2	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Step-out samples for 17SS23
	17SS64 ^a	35			
	17SS65	20			
	17SS66	20			
	17SS23A	0	5 - 7, 7 - 9 ^c		Deeper samples at 17SS23
17SD11	17SS67	15	0 - 0.5	Barium	Step-out samples for 17SD11 (not collected due to standing water at sample location)
	17SS68	15			
	17SS69	15			
	17SS70	15			
17SB01	17SS71	20	0 - 2, 5 - 7, 7 - 9 ^c , 9 - 11 ^c , 11 - 13 ^c	2,4-DNT and 2,6-DNT ^b	Step-out samples for 17SB01 (not collected due to standing water at sample location)
	17SS72	20			
	17SS73	15			
	17SS74	20			
	17SB01A	0	7 - 9 ^c , 9 - 11 ^c , 11 - 13 ^c		Deeper samples at 17SB01 (not collected due to standing water at sample location)
17SD04	17SS75	15	0 - 0.5	Barium	Step-out samples for 17SD04 (not collected due to standing water at sample location)
	17SS76	15			
	17SS77	15			
	17SS78	15			
17SD12	17SS79	15	0 - 0.5	Barium and Dioxins	Step-out samples for 17SD12
	17SS80	15			
	17SS81	15			
	17SS82	15			

Table 4-1
Soil Sample Summary

Prior Sample Location	New Sample Location	Step-out Distance (feet)	Sample Depth(s) (feet bgs)	Analytes	Basis for Sample Collection
17SS27 and 17WW01	17SS83	20	0 - 2, 2.5 - 4.5, 5 - 7	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Step-out samples for 17SS27 and 17WW01
	17SS84	20			
	17SS85	25			
	17SS86	25			
	17SS87	20	0 - 2, 2.5 - 4.5, 5 - 7		
	17SS27A	0	2.5 - 4.5, 5 - 7	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Deeper samples at 17SS27
	17WW01A	0	2.5 - 4.5, 5 - 7, 8 - 10 ^c	2,4-DNT and 2,6-DNT ^b	Deeper samples at 17WW01
17SS25	17SS62 ^a	37	0 - 2	2,4-DNT and 2,6-DNT ^b	Step-out locations for 17SS25 (17SS88 and 17SS89 are also set-out samples for location 17SB03 and depths for the samples are based on 17SB03)
	17SS64 ^a	40			
	17SS66 ^a	30			
	17SS88	40	0 - 2, 2.5 - 4.5, 5 - 7, 7 - 9 ^c		
	17SS89	40			
	17SS25A	0	2.5 - 4.5, 5 - 7	2,4-DNT and 2,6-DNT ^b	Deeper samples at 17SS25
17SB03 and 17SS29	17SS88 ^a	20	0 - 2, 2.5 - 4.5, 5 - 7, 7.5 - 9.5 ^c , 10 - 12 ^c	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Step-out samples for 17SB03 and 17SS29
	17SS89 ^a	20			
	17SS90	20			
	17SS91	20			
	17SB03A	0	7.5 - 9.5 ^c , 10 - 12 ^c , 12.5 - 14.5 ^c	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Deeper samples at 17SB03
	17SS29A	0	2.5 - 3, 3.5 - 5, 5.5 - 7	2,4-DNT and 2,6-DNT ^b	Deeper samples at 17SS29
17SB04	17SS92	20	0 - 2, 2.5 - 4.5, 5 - 7	2,4-DNT and 2,6-DNT ^b	Step-out samples for 17SB04
	17SS93	20			
	17SS94	20			
	17SB04A	0	2.5 - 4.5, 5 - 7, 7.5 - 9.5 ^c , 10 - 12 ^c		Deeper samples at 17SB04
COE17-08	17SS95	20	0 - 2	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Step-out samples for COE17-08
	17SS96	20			
	17SS97	20			
	17SS98	20			
	COE17-08A	0	0 - 2, 2.5 - 4.5		Deeper samples at COE17-08
COE17-14	17SS99	20	0 - 2, 2.5 - 4.5, 5 - 7	2,4-DNT and 2,6-DNT ^b	Step-out samples for COE17-14
	17SS100	20			
	17SS101	30			
	17SS102	20			
	COE17-14A	0			Deeper samples at COE17-14
COE17-15 and 17SB06	17SS101 ^a	30	0 - 2, 2.5 - 4.5	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Step-out samples for COE17-15 and 17SB06
	17SS103	20			
	17SS104	25			
	17SS105	20			
	COE17-15A	0	4 - 5, 5 - 7	2,4-DNT and 2,6-DNT ^b	Deeper samples at COE17-15
	17SB06A	0	7.5 - 9.5 ^c , 10 - 12 ^c , 12.5 - 14.5 ^c		Deeper samples at 17SB06

Table 4-1
Soil Sample Summary

Prior Sample Location	New Sample Location	Step-out Distance (feet)	Sample Depth(s) (feet bgs)	Analytes	Basis for Sample Collection
COE17-16	17SS104 ^a	25	0 - 2	2,4-DNT and 2,6-DNT ^b	Step-out samples for COE17-16
	17SS106	20			
	17SS107	20			
	17SS108	20			
	COE17-16A	0	4 - 5, 5 - 7		Deeper samples at COE17-16
Southwest Quadrant Locations	17SS109	0	0 - 2, 2.5 - 4.5, 5 - 7	2,4-DNT, 2,6-DNT and 2,4,6-TNT	Samples from new locations in southwest quadrant of site to replace data that was unusable due to laboratory errors.
	17SS110	0			
	17SS111	0			
	17SS112	0			
	17SS113	0			
	17SS114	0			
	17SS115	0			
	17SS116	0			
	17SS117	0			
	17SS118	0			
	17SS119	0			
	17SS120	0			
	17SS121	0			
	17SS122	0			
	17SS123	0			
	17SS124	0			
	17SS125	0			
	17SS126	0			

Notes:

Sample locations shaded in gray were inaccessible for sampling due to standing water present on the site. Samples will be collected at these locations as soon as conditions permit.

^a Sample is a duplicate of another location previously shown on the table, used as a step-out sample for two different prior sample locations

^b The analytes shown are those for which the sample location was used to refine previously detected concentrations exceeding the cleanup goals in the ROD. Due to an error in the field chain of custody, these locations were also analyzed for 2,4,6-TNT.

^c The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

bgs - below ground surface

DNT - dinitrotoluene

PDI - Pre-Design Investigation

ROD - Record of Decision

TNT - trinitrotoluene

Table 4-2**Dioxin Surface Soil Sample Results**

Location Code			17SS79		17SS80		17SS81		17SS82	
Sample Identification			17SS79-0.0-0.5		17SS80-0.0-0.5		17SS81-0.0-0.5		17SS82-0.0-0.5	
Sample Date			1/15/2018		1/15/2018		1/15/2018		1/15/2018	
Depth			0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5	
Analyte	Units	SS Eco PRG ^a	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
2,3,7,8-TCDD TEC	mg/kg	4×10^{-6}	1.13×10^{-7}	J	$<1.82 \times 10^{-6}$	U	5.75×10^{-7}	J	$<1.78 \times 10^{-6}$	U

Notes:

^a From *Baseline Ecological Risk Assessment*, Table 16-1 (Shaw 2007).

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

mg/kg - milligrams per kilogram

SS ECO PRG - surface soil (0 - 0.5 feet) ecological preliminary remediation goal

TCDD - tetrachlorodibenzo-p-dioxin

TEC - toxicity equivalence concentration

Val Qual - validation qualifier

Table 4-3
Barium Surface Soil Sample Results

Location Code			17SS48		17SS49		17SS50		17SS51		17SS52		17SS53		17SS54		17SS55		17SS79		17SS80		17SS81		17SS82	
Sample Identification			17SS48-0.0-0.5		17SS49-0.0-0.5		17SS50-0.0-0.5		17SS51-0.0-0.5		17SS52-0.0-0.5		17SS53-0.0-0.5		17SS54-0.0-0.5		17SS55-0.0-0.5		17SS79-0.0-0.5		17SS80-0.0-0.5		17SS81-0.0-0.5		17SS82-0.0-0.5	
Sample Date			1/14/2018		1/14/2018		1/14/2018		1/14/2018		1/13/2018		1/13/2018		1/13/2018		1/13/2018		1/15/2018		1/15/2018		1/15/2018		1/15/2018	
Depth			0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5	
Analyte	Units	SS Eco PRG ^a	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Barium	mg/kg	222	132		129		511		125		154		150		279		5,760		54.5		62		184		95.3	

Notes:
Blue shaded results indicate that the concentration exceeds the surface soil ecological PRG from the Final ROD (AECOM 2016).

^a From *Baseline Ecological Risk Assessment*, Table 16-1 (Shaw 2007).
AECOM - AECOM Technical Services, Inc.
mg/kg - milligrams per kilogram
ROD - Record of Decision
SS ECO PRG - surface soil (0 - 0.5 feet) ecological preliminary remediation goal
Val Qual - validation qualifier

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SB02A				17SB03A						17SB04A								17SB06A							
			Sample ID		17SB02A-11.0-13.0		17SB02A-13.0-15.0		17SB03A-7.5-9.5		17SB03A-10.0-12.0		17SB03A-12.5-14.5		17SB04A-2.5-4.5		17SB04A-5.0-7.0		17SB04A-7.5-9.5		17SB04A-10.0-12.0		17SB06A-7.5-9.5		17SB06A-10.0-12.0		17SB06A-12.5-14.5	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018			
	Depth		11 - 13		13 - 15		7.5 - 9.5		10 - 12		12.5 - 14.5		2.5 - 4.5		5 - 7		7.5 - 9.5		10 - 12		7.5 - 9.5		10 - 12		12.5 - 14.5			
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG			
		Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	
Explosives																												
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0302	U	< 0.0311	U	0.28		< 0.0296	U	0.43		< 0.0301	U	< 0.0297	U	< 0.0305	U	< 0.0311	U	< 0.029	U	< 0.0288	U	0.727			
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0302	U	< 0.0311	U	< 0.032	U	< 0.0296	U	0.0866		< 0.0301	U	< 0.0297	U	0.135		< 0.0311	U	< 0.029	U	< 0.0288	U	0.488			
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0302	U	< 0.0311	U	< 0.032	U	< 0.0296	U	< 0.0324	U	< 0.0301	U	< 0.0297	U	< 0.0305	U	< 0.0311	U	< 0.029	U	< 0.0288	U	1.96			

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS21A						17SS22A						17SS23A				17SS25A				17SS27A			
	Sample ID		17SS21A-0.0-2.0		17SS21A-3.0-5.0		17SS21A-5.0-7.0		17SS22A-3.0-5.0		17SS22A-5.0-7.0		17SS22A-7.0-9.0		17SS23A-5.0-7.0		17SS23A-7.0-9.0		17SS25A-2.5-4.5		17SS25A-5.0-7.0		17SS27A-2.5-4.5		17SS27A-5.0-7.0	
	Sample Date		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/12/2018		1/12/2018		1/11/2018		1/11/2018	
	Depth		0 - 2		3 - 5		5 - 7		3 - 5		5 - 7		7 - 9		5 - 7		7 - 9		2.5 - 4.5		5 - 7		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0301	U	0.364		< 0.0311	U	< 0.0325	U	< 0.0303	U	< 0.0292	U	< 0.0301	U	< 0.0293	U	0.177		< 0.0312	U	< 0.0313	U	< 0.0293	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0301	U	0.975		< 0.0311	U	< 0.0325	U	< 0.0303	U	< 0.0292	U	< 0.0301	U	< 0.0293	U	0.0873		< 0.0312	U	< 0.0313	U	< 0.0293	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0301	U	0.423		< 0.0311	U	< 0.0325	U	< 0.0303	U	< 0.0292	U	< 0.0301	U	< 0.0293	U	< 0.0313	U	< 0.0312	U	< 0.0313	U	< 0.0293	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS29A						17SS56		17SS57		17SS58		17SS59		17SS60		17SS61		17SS62		17SS63		17SS64	
	Sample ID		17SS29A-2.5-3.0		17SS29A-3.5-5		17SS29A-5.5-7.0		17SS56-0.0-0.5		17SS57-0.0-0.5		17SS58-0.0-0.5		17SS59-0.0-0.5		17SS60-0.0-2.0		17SS61-0.0-2.0		17SS62-0.0-2.0		17SS63-0.0-2.0		17SS64-0.0-2.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/13/2018		1/13/2018		1/13/2018		1/13/2018		1/13/2018		1/13/2018		1/14/2018		1/14/2018		1/14/2018	
	Depth		2.5 - 3		3.5 - 5		5.5 - 7		0 - 0.5		0 - 0.5		0 - 0.5		0 - 0.5		0 - 2		0 - 2		0 - 2		0 - 2		0 - 2	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	24.6		12.5		0.838		< 0.0322	U	< 0.03	U	0.338		0.0942		329		291	J	5.16		0.236		109	
2,4-Dinitrotoluene	mg/kg	0.042	0.0682		0.0988		< 0.0332	U	0.151		0.21		0.457		0.616		1.43		0.828	J	0.743		0.259		17.1	
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0297	U	0.0718		< 0.0332	U	< 0.0322	U	0.0776		0.176		0.052		1.14		0.422	J	0.388		0.181		2.05	

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS65		17SS66		17SS83						17SS84						17SS85					
	Sample ID		17SS65-0.0-2.0		17SS66-0.0-2.0		17SS83-0.0-2.0		17SS83-2.5-4.5		17SS83-5.0-7.0		17SS84-0.0-2.0		17SS84-2.5-4.5		17SS84-5.0-7.0		17SS85-0.0-2.0		17SS85-2.5-4.5		17SS85-5.0-7.0	
	Sample Date		1/14/2018		1/14/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018	
	Depth		0 - 2		0 - 2		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																								
2,4,6-Trinitrotoluene	mg/kg	5.1	0.129		0.572		< 0.0303	U	< 0.0297	U	< 0.0286	U	1.34		< 0.0282	U	< 0.0296	U	0.254		< 0.0291	U	< 0.0292	U
2,4-Dinitrotoluene	mg/kg	0.042	0.0604		0.112		< 0.0303	U	< 0.0297	U	< 0.0286	U	3.21		< 0.0282	U	< 0.0296	U	0.0934		< 0.0291	U	< 0.0292	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0306	U	< 0.0298	U	< 0.0303	U	< 0.0297	U	< 0.0286	U	0.569		< 0.0282	U	< 0.0296	U	< 0.0347	U	< 0.0291	U	< 0.0292	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

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U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS86						17SS87						17SS88									
	Sample ID		17SS86-0.0-2.0		17SS86-2.5-4.5		17SS86-5.0-7.0		17SS87-0.0-2.0		17SS87-2.5-4.5		17SS87-5.0-7.0		17SS88-0.0-2.0		17SS88-2.5-4.5		17SS88-5.0-7.0		17SS88-7.5-9.5		17SS88-10.0-12.0	
	Sample Date		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		7.5 - 9.5		10 - 12	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																								
2,4,6-Trinitrotoluene	mg/kg	5.1	0.227		< 0.0295	U	< 0.0289	U	1480		1.32		< 0.0292	U	0.704		< 0.0289	U	< 0.031	U	< 0.0297	U	< 0.0302	U
2,4-Dinitrotoluene	mg/kg	0.042	0.512		< 0.0295	U	< 0.0289	U	33.8		< 0.0302	U	< 0.0292	U	1.48		< 0.0289	U	< 0.031	U	< 0.0297	U	< 0.0302	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0283	U	< 0.0295	U	< 0.0289	U	27.5		< 0.0302	U	< 0.0292	U	0.78		< 0.0289	U	< 0.031	U	< 0.0297	U	< 0.0302	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

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Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS89										17SS90									
	Sample ID		17SS89-0.0-2.0		17SS89-2.5-4.5		17SS89-5.0-7.0		17SS89-7.5-9.5		17SS89-10.0-12.0		17SS90-0.0-2.0		17SS90-2.5-4.5		17SS90-5.0-7.0		17SS90-7.5-9.5		17SS90-10.0-12.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		7.5 - 9.5		10 - 12		0 - 2		2.5 - 4.5		5 - 7		7.5 - 9.5		10 - 12	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																						
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0275	U	< 0.0315	U	< 0.0317	U	< 0.0308	U	< 0.0289	U	< 0.0275	U	< 0.0307	U	< 0.0311	U	< 0.0302	U	< 0.0313	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0275	U	< 0.0315	U	< 0.0317	U	< 0.0308	U	< 0.0289	U	< 0.0275	U	< 0.0307	U	< 0.0311	U	< 0.0302	U	< 0.0313	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0275	U	< 0.0315	U	< 0.0317	U	< 0.0308	U	< 0.0289	U	< 0.0275	U	< 0.0307	U	< 0.0311	U	< 0.0302	U	< 0.0313	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

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Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

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U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS91										17SS92						17SS93							
			Sample ID		17SS91-0.0-2.0		17SS91-2.5-4.5		17SS91-5.0-7.0		17SS91-7.5-9.5		17SS91-10.0-12.0		17SS92-0.0-2.0		17SS92-2.5-4.5		17SS92-5.0-7.0		17SS93-0.0-2.0		17SS93-2.5-4.5		17SS93-5.0-7.0	
			Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
			Depth		0 - 2		2.5 - 4.5		5 - 7		7.5 - 9.5		10 - 12		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7	
			Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	39.6		19.8		< 0.0327	U	688		< 0.0288	U	< 0.029	U	0.0825		< 0.0291	U	0.179		< 0.0299	U	< 0.0306	U		
2,4-Dinitrotoluene	mg/kg	0.042	0.59		< 0.03	U	< 0.0327	U	1.52		< 0.0288	U	< 0.029	U	0.109		< 0.0291	U	0.263		< 0.0299	U	< 0.0306	U		
2,6-Dinitrotoluene	mg/kg	0.042	0.213		< 0.03	U	< 0.0327	U	0.822		< 0.0288	U	< 0.029	U	0.0498		< 0.0291	U	< 0.0294	U	< 0.0299	U	< 0.0306	U		

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

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Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS94						17SS95		17SS96		17SS97		17SS98		17SS99					
	Sample ID		17SS94-0.0-2.0		17SS94-2.5-4.5		17SS94-5.0-7.0		17SS95-0.0-2.0		17SS96-0.0-2.0		17SS97-0.0-2.0		17SS98-0.0-2.0		17SS99-0.0-2.0		17SS99-2.5-4.5		17SS99-5.0-7.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/14/2018		1/14/2018		1/14/2018		1/14/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		0 - 2		0 - 2		0 - 2		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																						
2,4,6-Trinitrotoluene	mg/kg	5.1	0.0701		< 0.0303	U	< 0.0289	U	8.26		0.543		< 0.0294	U	< 0.0285	U	< 0.0306	U	< 0.0301	U	< 0.0305	U
2,4-Dinitrotoluene	mg/kg	0.042	0.0908		< 0.0303	U	< 0.0289	U	0.408		0.246		< 0.0294	U	< 0.0285	U	< 0.0306	U	< 0.0301	U	< 0.0305	U
2,6-Dinitrotoluene	mg/kg	0.042	0.0627		< 0.0303	U	< 0.0289	U	0.407		0.148		< 0.0294	U	< 0.0285	U	< 0.0306	U	< 0.0301	U	< 0.0305	U

Notes:

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REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS100						17SS101						17SS102						17SS103			
	Sample ID		17SS100-0.0-2.0		17SS100-2.5-4.5		17SS100-5.0-7.0		17SS101-0.0-2.0		17SS101-2.5-4.5		17SS101-5.0-7.0		17SS102-0.0-2.0		17SS102-2.5-4.5		17SS102-5.0-7.0		17SS103-0.0-2.0		17SS103-2.5-4.5	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																								
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0295	U	< 0.0298	U	< 0.0302	U	< 0.0295	U	< 0.0321	U	< 0.0329	U	< 0.0291	U	< 0.0306	U	< 0.03	U	0.707		< 0.0276	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0295	U	< 0.0298	U	< 0.0302	U	< 0.0295	U	< 0.0321	U	< 0.0329	U	< 0.0291	U	< 0.0306	U	< 0.03	U	1.72		< 0.0276	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0295	U	< 0.0298	U	< 0.0302	U	< 0.0295	U	< 0.0321	U	< 0.0329	U	< 0.0291	U	< 0.0306	U	< 0.03	U	3.75		< 0.0276	U

Notes:

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ID - identification

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REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS104				17SS105				17SS106		17SS107		17SS108		17SS109					
	Sample ID		17SS104-0.0-2.0		17SS104-2.5-4.5		17SS105-0.0-2.0		17SS105-2.5-4.5		17SS106-0.0-2.0		17SS107-0.0-2.0		17SS108-0.0-2.0		17SS109-0.0-2.0		17SS109-2.5-4.5		17SS109-5.0-7.0	
	Sample Date		1/13/2018		1/13/2018		1/12/2018		1/12/2018		1/14/2018		1/14/2018		1/13/2018		1/11/2018		1/11/2018		1/11/2018	
	Depth		0 - 2		2.5 - 4.5		0 - 2		2.5 - 4.5		0 - 2		0 - 2		0 - 2		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																						
2,4,6-Trinitrotoluene	mg/kg	5.1	0.63		< 0.0297	U	2.39		< 0.0335	U	0.117		44.2		9970		< 0.0319	U	< 0.0286	U	< 0.0296	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0302	U	< 0.0297	U	0.088		< 0.0335	U	0.0822		3.39		5.51		< 0.0319	U	< 0.0286	U	< 0.0296	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0302	U	< 0.0297	U	0.0925		< 0.0335	U	0.0739		11.2		7.93		< 0.0319	U	< 0.0286	U	< 0.0296	U

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mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS110						17SS111						17SS112						17SS113					
	Sample ID		17SS110-0.0-2.0		17SS110-2.5-4.5		17SS110-5.0-7.0		17SS111-0.0-2.0		17SS111-2.5-4.5		17SS111-5.0-7.0		17SS112-0.0-2.0		17SS112-2.5-4.5		17SS112-5.0-7.0		17SS113-0.0-2.0		17SS113-2.5-4.5		17SS113-5.0-7.0	
	Sample Date		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0312	U	< 0.0292	U	< 0.0293	U	< 0.0305	U	< 0.0299	U	< 0.0271	U	< 0.0302	U	< 0.0285	U	< 0.0289	U	< 0.0312	U	< 0.0293	U	< 0.0296	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0312	U	< 0.0292	U	< 0.0293	U	< 0.0305	U	< 0.0299	U	< 0.0271	U	< 0.0302	U	< 0.0285	U	< 0.0289	U	< 0.0312	U	< 0.0293	U	< 0.0296	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0312	U	< 0.0292	U	< 0.0293	U	< 0.0305	U	< 0.0299	U	< 0.0271	U	< 0.0302	U	< 0.0285	U	< 0.0289	U	< 0.0312	U	< 0.0293	U	< 0.0296	U

Notes:

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REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS114						17SS115						17SS116						17SS117					
	Sample ID		17SS114-0.0-2.0		17SS114-2.5-4.5		17SS114-5.0-7.0		17SS115-0.0-2.0		17SS115-2.5-4.5		17SS115-5.0-7.0		17SS116-0.0-2.0		17SS116-2.5-4.5		17SS116-5.0-7.0		17SS117-0.0-2.0		17SS117-2.5-4.5		17SS117-5.0-7.0	
	Sample Date		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/11/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0299	U	< 0.0321	U	< 0.0312	U	< 0.0308	U	< 0.0291	U	< 0.0294	U	< 0.0318	U	< 0.0282	U	< 0.0281	U	< 0.0308	U	< 0.029	U	< 0.0288	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0299	U	< 0.0321	U	< 0.0312	U	< 0.0308	U	< 0.0291	U	< 0.0294	U	< 0.0318	U	< 0.0282	U	< 0.0281	U	< 0.0308	U	< 0.029	U	< 0.0288	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0299	U	< 0.0321	U	< 0.0312	U	< 0.0308	U	< 0.0291	U	< 0.0294	U	< 0.0318	U	< 0.0282	U	< 0.0281	U	< 0.0308	U	< 0.029	U	< 0.0288	U

Notes:

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ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS118						17SS119						17SS120						17SS121					
	Sample ID		17SS118-0.0-2.0		17SS118-2.5-4.5		17SS118-5.0-7.0		17SS119-0.0-2.0		17SS119-2.5-4.5		17SS119-5.0-7.0		17SS120-0.0-2.0		17SS120-2.5-4.5		17SS120-5.0-7.0		17SS121-0.0-2.0		17SS121-2.5-4.5		17SS121-5.0-7.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/11/2018		1/11/2018		1/11/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0344	U	< 0.0299	U	< 0.0288	U	< 0.0299	U	< 0.0302	U	< 0.0286	U	< 0.0313	U	< 0.0287	U	< 0.0293	U	< 0.0336	U	< 0.0314	U	< 0.0278	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0344	U	< 0.0299	U	< 0.0288	U	< 0.0299	U	< 0.0302	U	< 0.0286	U	< 0.0313	U	< 0.0287	U	< 0.0293	U	< 0.0336	U	< 0.0314	U	< 0.0278	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0344	U	< 0.0299	U	< 0.0288	U	< 0.0299	U	< 0.0302	U	< 0.0286	U	< 0.0313	U	< 0.0287	U	< 0.0293	U	< 0.0336	U	< 0.0314	U	< 0.0278	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS122						17SS123						17SS124						17SS125					
	Sample ID		17SS122-0.0-2.0		17SS122-2.5-4.5		17SS122-5.0-7.0		17SS123-0.0-2.0		17SS123-2.5-4.5		17SS123-5.0-7.0		17SS124-0.0-2.0		17SS124-2.5-4.5		17SS124-5.0-7.0		17SS125-0.0-2.0		17SS125-2.5-4.5		17SS125-5.0-7.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																										
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0316	U	< 0.0292	U	< 0.028	U	< 0.0303	U	< 0.0303	U	< 0.0293	U	< 0.0306	U	< 0.0293	U	< 0.0298	U	< 0.0296	U	< 0.03	U	< 0.0285	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0316	U	< 0.0292	U	< 0.028	U	< 0.0303	U	< 0.0293	U	< 0.0293	U	< 0.0306	U	< 0.0293	U	< 0.0298	U	< 0.0296	U	< 0.03	U	< 0.0285	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0316	U	< 0.0292	U	< 0.028	U	< 0.0303	U	< 0.0293	U	< 0.0293	U	< 0.0306	U	< 0.0293	U	< 0.0298	U	< 0.0296	U	< 0.03	U	< 0.0285	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		17SS126						17WW01A						COE17-08A				COE17-14A					
	Sample ID		17SS126-0.0-2.0		17SS126-2.5-4.5		17SS126-5.0-7.0		17WW01A-2.5-4.5		17WW01A-5.0-7.0		17WW01A-8.0-10.0		COE17-08A-0.0-2.0		COE17-08A-2.5-4.5		COE17-14A-0.0-2.0		COE17-14A-2.5-4.5		COE17-14A-5.0-7.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/11/2018		1/11/2018		1/11/2018		1/14/2018		1/14/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		0 - 2		2.5 - 4.5		5 - 7		2.5 - 4.5		5 - 7		8 - 10		0 - 2		2.5 - 4.5		0 - 2		2.5 - 4.5		5 - 7	
	Sample Purpose		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives																								
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0301	U	< 0.0288	U	< 0.0289	U	< 0.0293	U	< 0.0285	U	< 0.03	U	< 0.0284	U	< 0.0299	U	0.438	J	< 0.0279	U	< 0.0302	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0301	U	< 0.0288	U	< 0.0289	U	< 0.0293	U	< 0.0285	U	< 0.03	U	0.0693		< 0.0299	U	0.719	J	< 0.0279	U	< 0.0302	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0301	U	< 0.0288	U	< 0.0289	U	< 0.0293	U	< 0.0285	U	< 0.03	U	< 0.0284	U	< 0.0299	U	0.254	J	< 0.0279	U	< 0.0302	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 4-4
Explosives Soil Sample Analytical Results

Analyte	Location Code		COE17-15A				COE17-16A			
	Sample ID		COE17-15A-4.0-5.0		COE17-15A-5.0-7.0		COE17-16A-4.0-5.0		COE17-16A-5.0-7.0	
	Sample Date		1/12/2018		1/12/2018		1/12/2018		1/12/2018	
	Depth		4 - 5		5 - 7		4 - 5		5 - 7	
	Sample Purpose		REG		REG		REG		REG	
	Units	Industrial Soil (Human Health)	Result	Val Qual	Result	Val Qual	Result	Val Qual	Result	Val Qual
Explosives										
2,4,6-Trinitrotoluene	mg/kg	5.1	< 0.0308	U	< 0.0315	U	0.183		< 0.0314	U
2,4-Dinitrotoluene	mg/kg	0.042	< 0.0308	U	< 0.0315	U	0.0393		< 0.0314	U
2,6-Dinitrotoluene	mg/kg	0.042	< 0.0308	U	< 0.0315	U	< 0.0303	U	< 0.0314	U

Notes:

Blue highlighted concentrations in bold exceed the industrial (HH) soil standards.

The water table at the time of sampling was approximately 7 feet bgs at the site. Samples from deeper than 7 feet bgs were collected as required by the PDI Work Plan, but are not representative of vadose zone concentrations.

Human health cleanup levels are from the Final Record of Decision, August 2016.

Some samples may have been diluted due to the concentration(s) of one or more analytes exceeding the upper limit of the calibration curve.

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

ID - identification

mg/kg - milligrams per kilogram

REG - regulatory

Table 5-5
Field Pumping Rate and Depth to Water Measurements

Date	Time	Flow Rate (gal/min)			Depth to Water (feet)							
		17WW02	17WW01	17WW06	17WW02	17PZ01	17PZ02	17PZ03	17WW01	17WW06	130	MW-8
1/23/2018	1800	0.25			17.76	9.55	10.05	9.83	11.00	11.72	8.00	18.98
	1815	0.23			17.84							
	1830	0.23			17.94							
	1845	0.23			17.96							
	1900	0.23			17.97	9.58	10.08	9.86	10.98	11.74	8.87	18.97
	1915	0.22			17.98							
	1930	0.23			17.99							
	1945	0.23			17.99							
	2000	0.23			17.99	9.60	10.08	9.88	10.98	11.74	8.87	18.98
	2015											
	2030	0.23			18.03							
	2045	0.23			18.05							
	2100	0.23			18.07	9.62	10.10	9.90	10.98	11.74	8.85	18.98
	2130	0.23			18.09							
	2200	0.23			18.14	9.62	10.11	9.90	10.99	11.75	8.86	18.99
	2230	0.23			18.11							
	2300	0.23			18.14	9.63	10.12	9.91	10.98	11.74	8.85	19.00
	2330	0.23			18.14							
1/24/2018	0000	0.23			18.15	9.63	10.12	9.92	10.99	11.75	8.86	19.00
	0030	0.23			18.15							
	100	0.23			18.14	7.62	10.11	9.91	10.77	11.75	8.86	19.06
	130	0.23			18.15							
	200	0.23			18.15	9.63	10.12	9.92	10.98	11.74	8.85	18.99
	230	0.23			18.15							
	300	0.23			18.12	9.63	10.11	9.92	10.99	11.75	8.86	19.00
	330	0.23			18.12							
	400	0.23			18.18	9.63	10.12	9.43	10.99	11.74	8.86	19.00
	430	0.23			18.19							
	500	0.23			18.19	9.64	10.13	9.93	11.00	11.76	8.87	19.01
	530	0.23										
	600	0.23										
	630	0.23										
	700				18.21	9.68	10.18	9.92	11.03	11.78	8.89	19.03
	730	0.23			18.20							
	800	0.23			18.21	9.69	10.18	9.97	11.03	11.79	8.89	19.03
	830											
	900	0.23			18.24	9.70	10.19	9.98	11.04	11.79	8.90	19.03
	930											
	1000	0.23			18.27	9.70	10.19	9.98	11.04	11.79	8.90	19.04
	1030											
	1100	0.23			18.31	9.70	10.19	9.98	11.03	11.79	8.90	19.04
	1130											
	1205	0.23										
	1300	0.22			18.11	9.67	10.16	9.95	10.99	11.74	8.85	19.04
	1322	0.23										
	1400	0.23			18.20	9.67	10.16	9.94	10.99	11.74	8.50	19.04
	1500	0.23			18.19	9.67	10.16	9.94	10.99	11.74	8.84	19.03
	1600	0.23			18.28	9.67	10.17	9.94	10.99	11.74	8.84	19.02
	1700	0.23			18.43	9.68	10.17	9.95	11.00	11.75	8.85	19.02
	1800	0.23			18.41	9.69	10.18	9.96	11.03	11.76	8.85	19.03
	1900	0.23			18.43	9.76	10.20	9.97	11.03	11.77	8.87	19.03
	2000	0.23			18.21	9.70	10.20	9.97	11.03	11.77	8.82	19.03
	2100	0.23			18.35	9.70	10.19	9.96	11.03	11.77	8.88	19.04
	2200	0.23			18.40	9.70	10.19	9.96	11.03	11.77	8.88	19.04
	2300	0.24			18.47	9.71	10.20	9.97	11.03	11.78	8.89	19.04
1/25/2018	0000	0.23			18.58	9.71	10.20	9.97	11.03	11.78	8.89	19.07
	100	0.23			18.42	9.70	10.20	9.98	11.03	11.78	8.89	19.03
	200	0.23			18.40	9.71	10.20	9.98	11.03	11.78	8.89	19.04
	300	0.23			18.42	9.71	10.20	9.98	11.03	11.78	8.89	19.04
	400	0.23			18.40	9.90	10.21	9.98	11.03	11.78	8.89	19.04
	500	0.25			18.80	9.71	10.21	9.98	11.04	11.79	8.89	19.04
	600	0.25			18.80	9.70	10.20	9.98	11.04	11.78	8.89	19.03
	700	0.24			18.80	9.71	10.20	9.98	11.04	11.79	8.89	19.04
	800	0.23			18.58	9.73	10.21	10.00	11.03	11.78	8.91	19.03
	1000	0.22			18.58	9.73	10.22	10.00	11.04	11.78	8.91	19.03
	1100	0.23			18.59	9.77	10.21	9.99	11.02	11.77	8.90	19.03
	1200	0.24			18.59	9.71	10.20	9.98	11.01	11.76	8.89	19.03
	1300	0.24			18.80	9.69	10.18	9.96	10.99	11.73	8.85	19.02
	1400	0.24			18.81	9.69	10.17	9.95	10.98	11.72	8.85	19.01
	1500	0.25			18.78	9.69	10.19	9.95	10.98	11.72	8.85	19.01
	1800	0.23	0.22	0.25	18.50	9.70	10.20	9.95	12.59	12.34	8.85	19.00
	1900	0.23	0.23	0.25	18.50	9.70	10.20	9.95	12.63	12.35	8.85	19.00
	2000	0.25	0.22	0.25	18.20	9.70	10.21	9.95	12.65	12.35	8.84	19.01

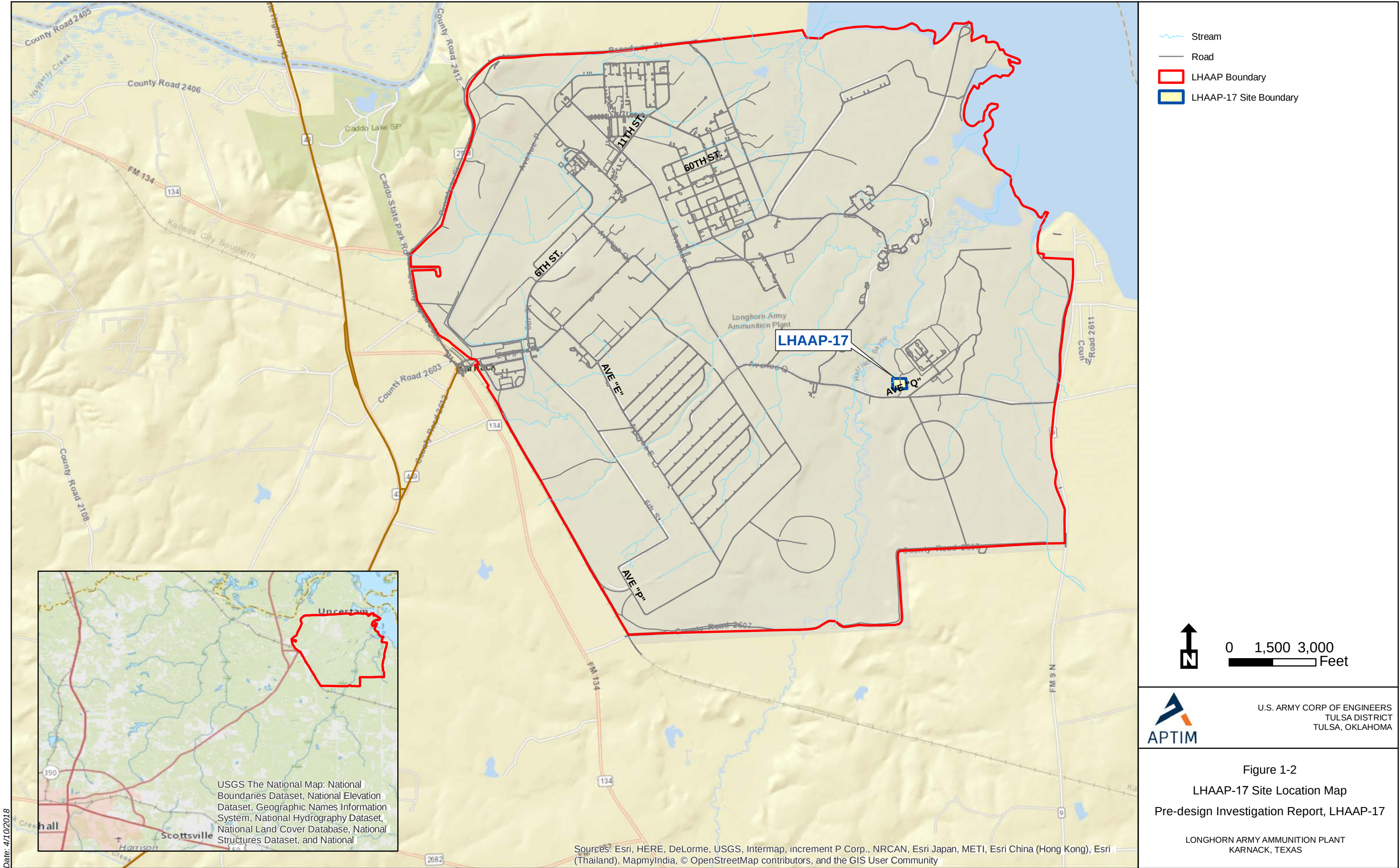
Table 5-5
Field Pumping Rate and Depth to Water Measurements

Date	Time	Flow Rate (gal/min)			Depth to Water (feet)							
		17WW02	17WW01	17WW06	17WW02	17PZ01	17PZ02	17PZ03	17WW01	17WW06	130	MW-8
	2100	0.23	0.22	0.24	18.69	9.71	10.20	9.96	12.64	12.37	8.87	19.00
	2200	0.25	0.23	0.25	18.75	9.71	10.20	9.96	12.64	12.38	8.88	19.01
	2300	0.23	0.23	0.25	19.10	9.71	10.21	9.97	12.65	12.35	8.87	19.00
1/26/2018	0000	0.22	0.23	0.23	18.83	9.70	10.20	9.96	12.77	12.70	8.88	19.01
	0100	0.23	0.22	0.23	18.88	9.70	10.20	9.97	12.76	12.46	8.89	19.00
	0200	0.23	0.22	0.25	18.93	9.70	10.20	9.97	12.77	12.38	8.87	19.00
	0300	0.23	0.22	0.23	18.60	9.70	10.20	9.96	12.76	12.40	8.88	19.01
	0400	0.23	0.23	0.22	18.70	9.76	10.20	10.00	12.76	12.34	8.88	19.00
	0500	0.22	0.23	0.24	18.74	9.71	10.21	10.00	12.76	12.35	8.88	19.00
	0600	0.23	0.23	0.25	18.77	9.71	10.25	10.00	12.72	12.34	8.88	19.00
	0700	0.23	0.23	0.25	18.87	9.71	10.25	10.00	12.77	12.34	8.87	19.00
	0800	0.26	0.26	0.26	18.96	9.76	10.25	10.01	12.74	12.37	8.90	18.90
	0900	0.26	0.89	1.01	18.68	9.76	10.25	10.01	17.73	13.94	8.89	18.95
	1000	0.25	1.01	0.98	18.69	9.77	10.26	10.02	19.58	14.10	8.89	18.96
	1100	0.25	1.01	1.01	18.75	9.77	10.27	10.03	19.77	14.16	9.89	18.95
	1200	0.25	0.98	1.01	18.80	9.77	10.27	10.02	19.91	14.21	8.87	18.94
	1300	0.25	0.96	1.03	18.81	9.78	10.28	10.02	19.97	14.25	8.86	18.93
	1400	0.25	1.25	1.56	18.33	9.77	10.29	10.02	21.64	15.53	8.85	18.93
	1500	0.25	1.25	1.59	18.98	9.81	10.31	10.04	22.04	15.72	8.86	18.91
	1600	0.25	1.22	1.56	18.56	9.82	10.34	10.05	22.31	15.77	8.87	18.90

Notes:

gal/min - gallons per minute

Figures



Date: 4/10/2018

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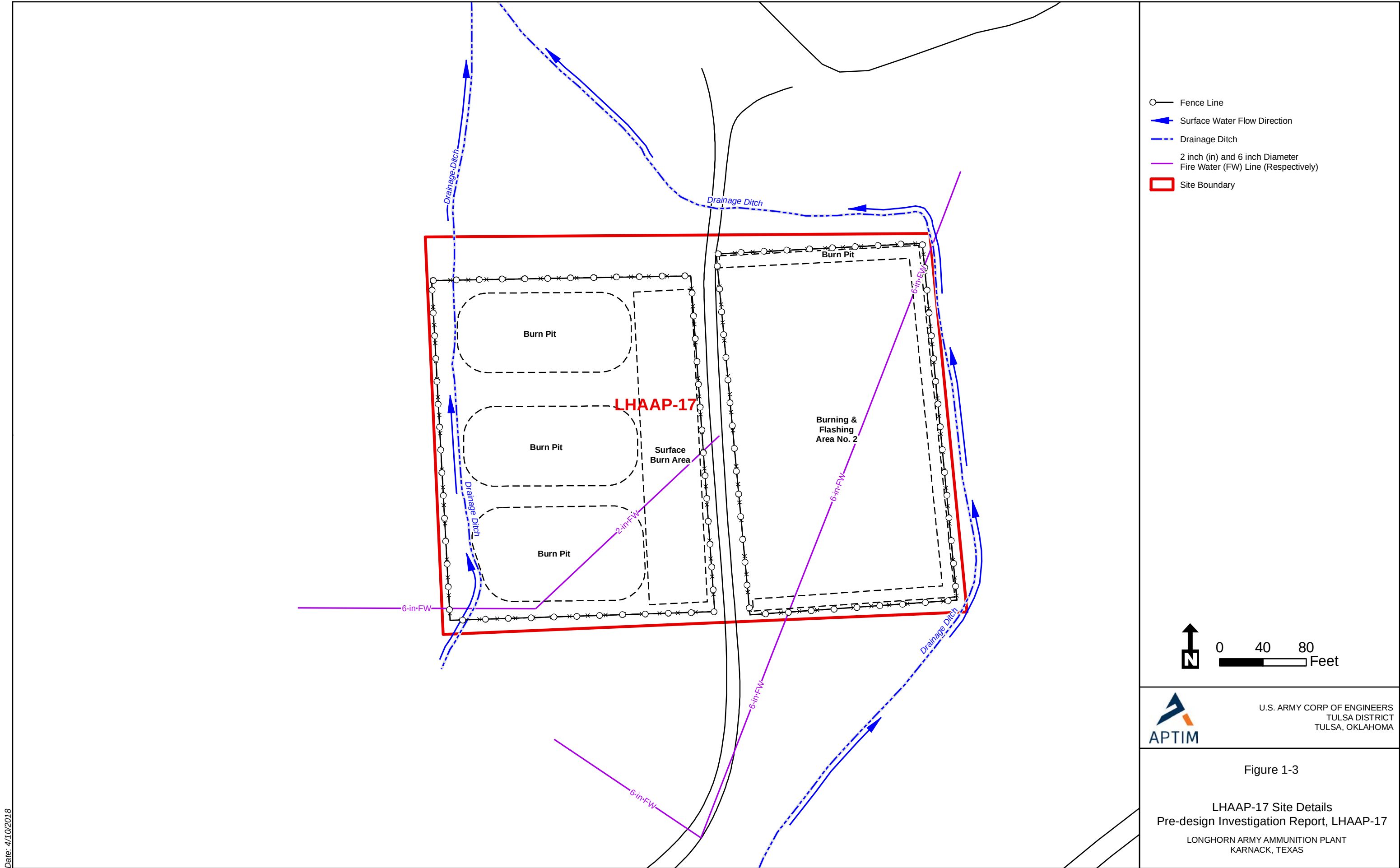
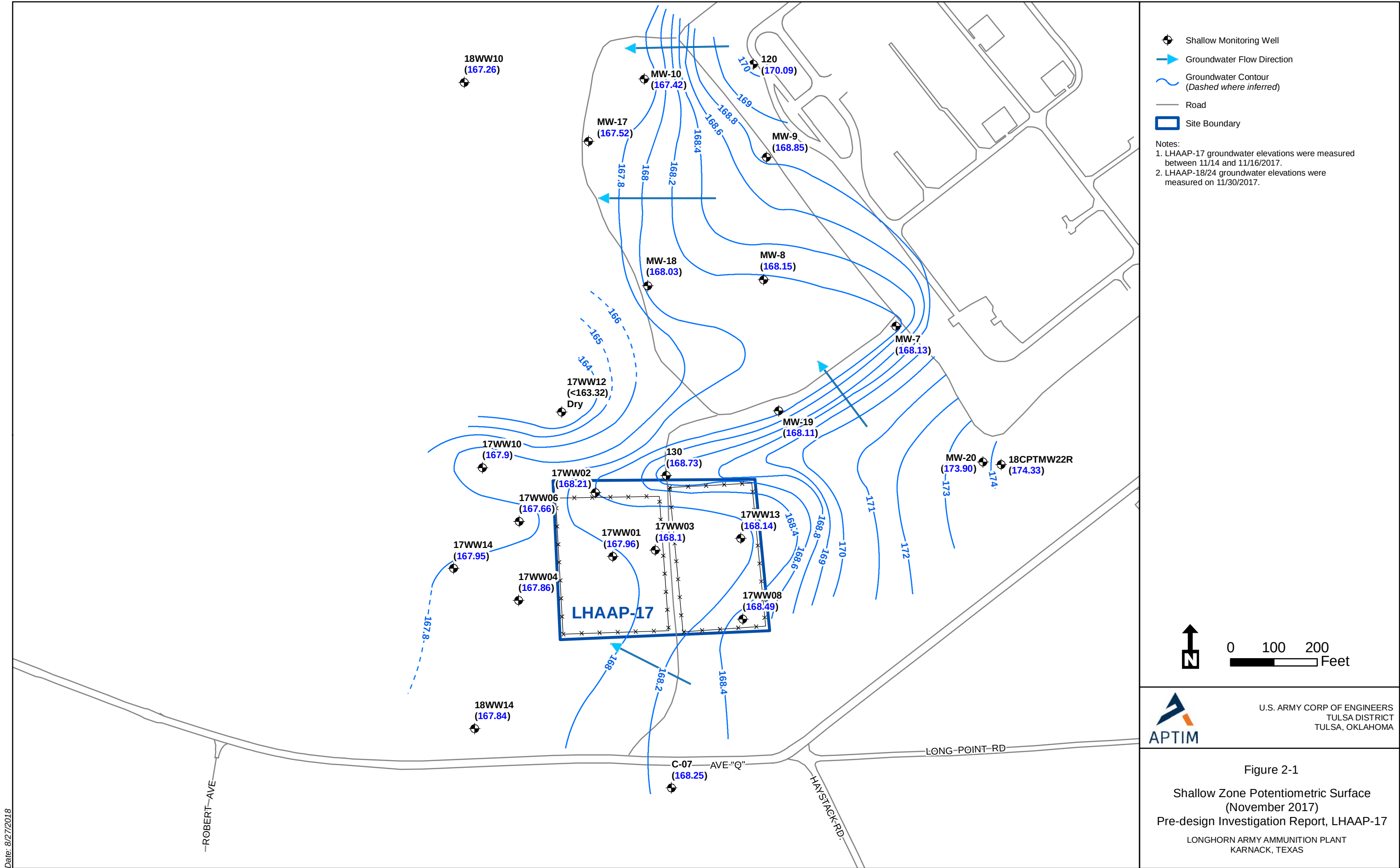
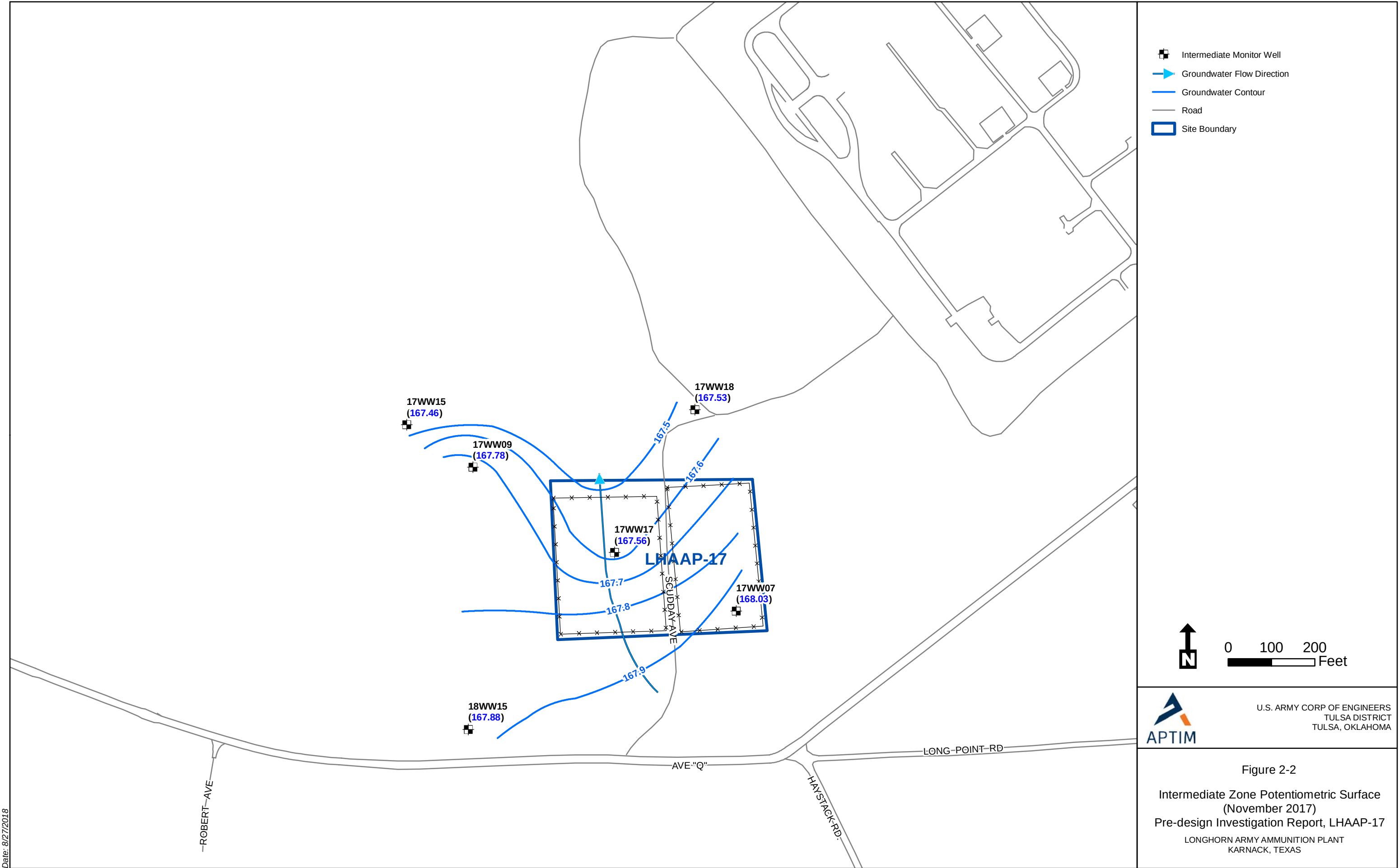


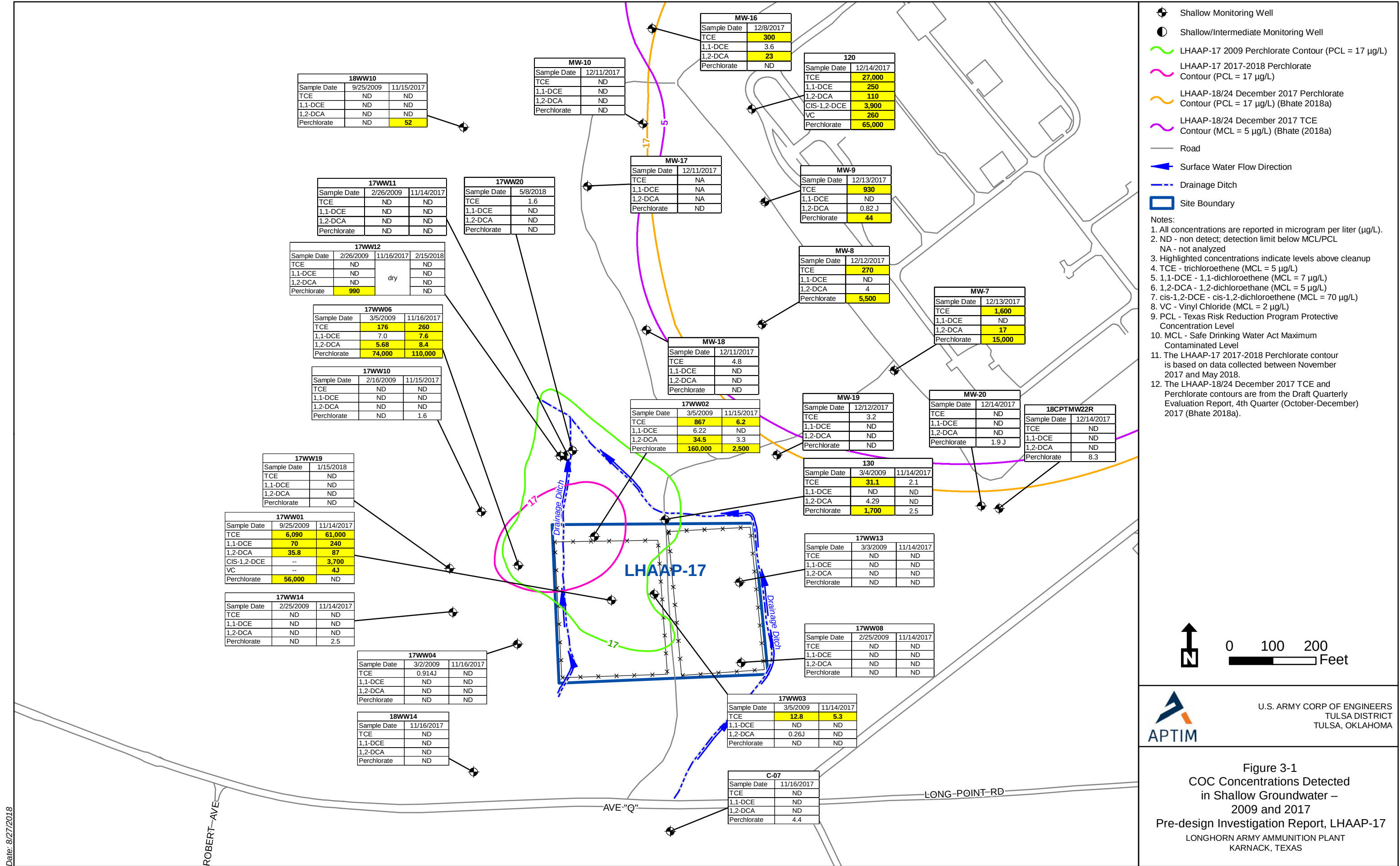
Figure 1-3

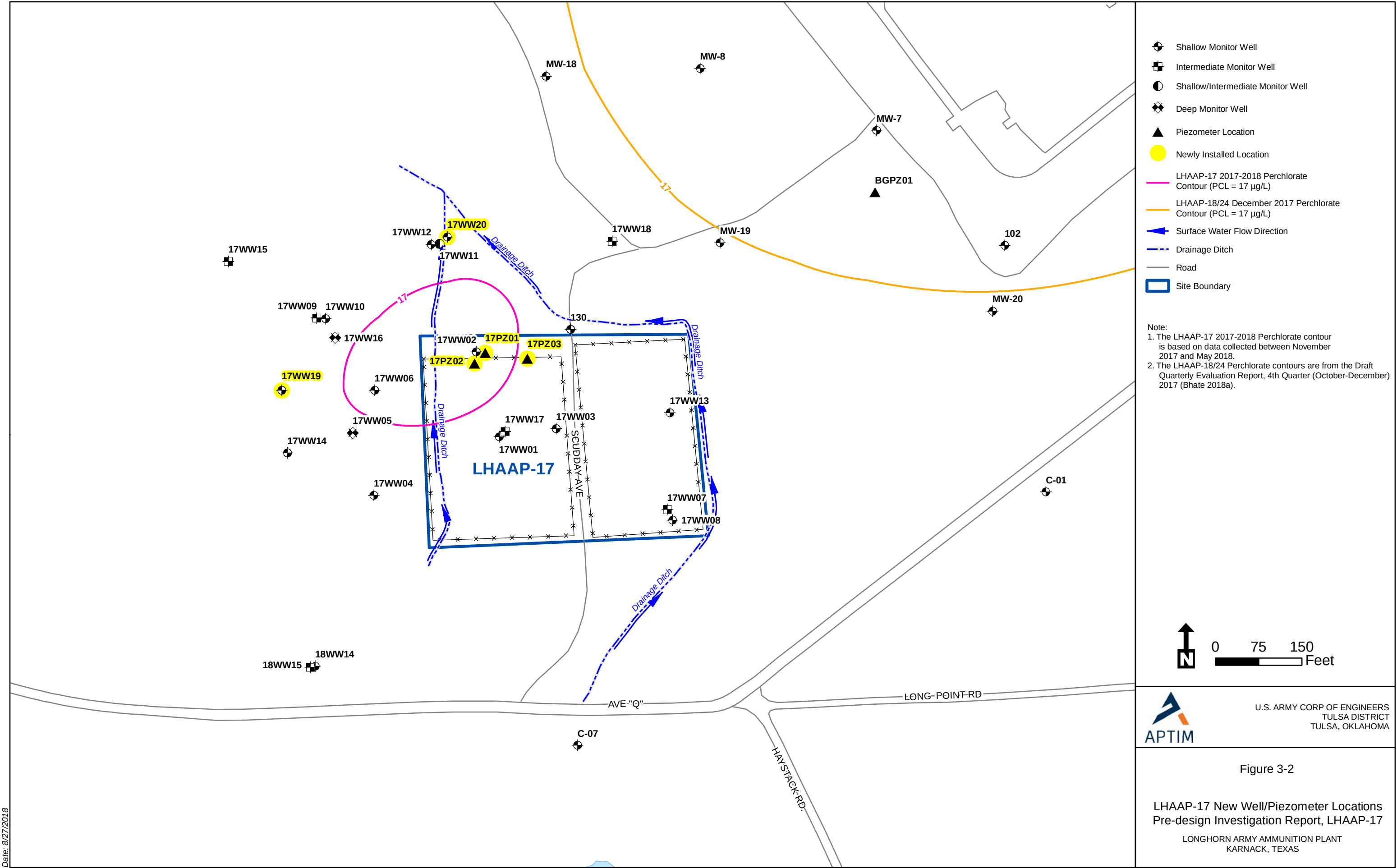
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Pre-design Investigation Report, LHAAP-17
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS



Date: 8/27/2018







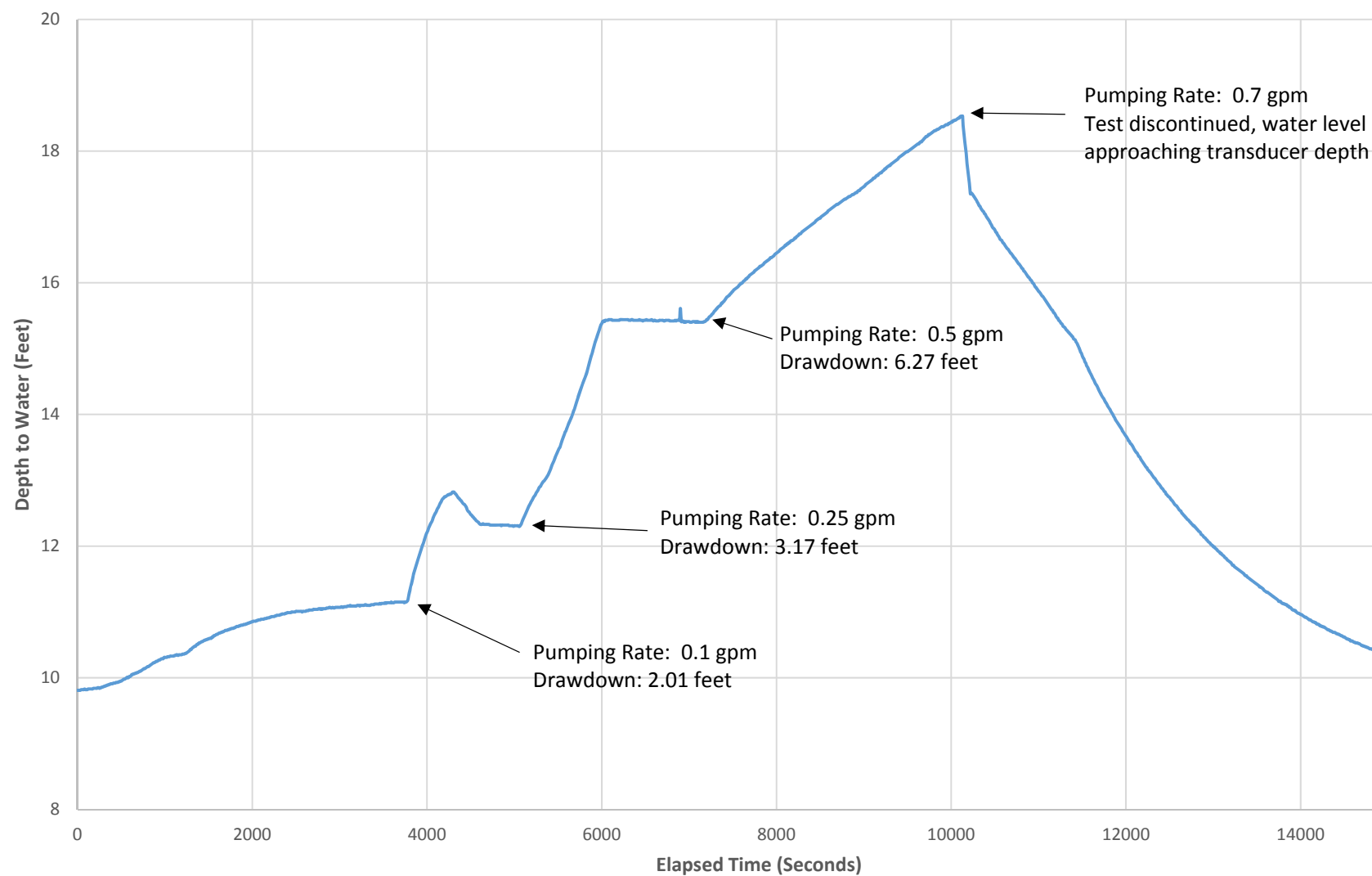
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Figure 3-2

LHAAP-17 New Well/Piezometer Locations
Pre-design Investigation Report, LHAAP-17
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

Figure 5-1
17WW02 Step Drawdown Test



**Figure 5-2 - 17WW02 Time vs Drawdown**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Constant Rate Pumping Test

Pumping Well: 17WW02

Test Conducted by: Bill Foss

Test Date: 1/23/2018

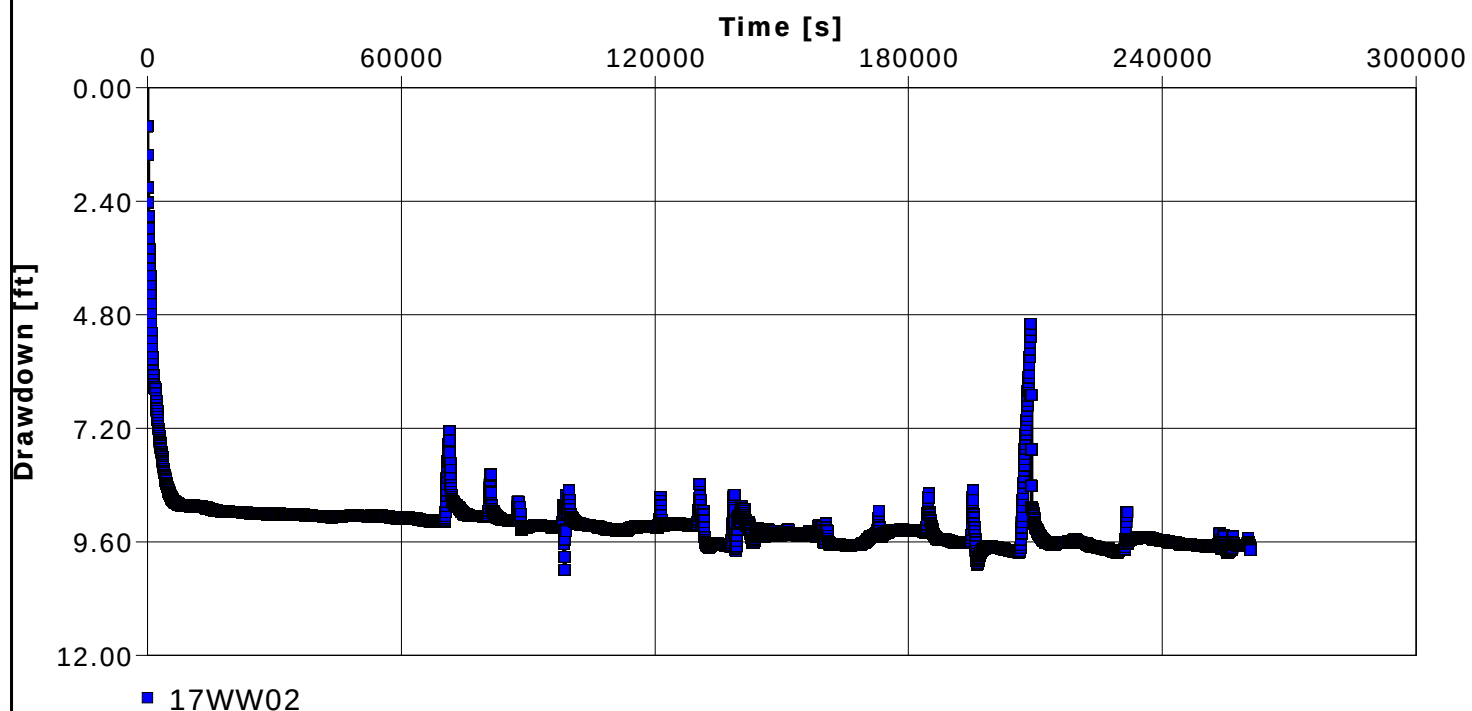
Analysis Performed by: WFoss

17WW02 Time-Drawdown

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

Discharge Rate: 0.24 [U.S. gal/min]



**Figure 5-3 - 17PZ01 Time vs Drawdown**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Constant Rate Pumping Test

Pumping Well: 17WW02

Test Conducted by: Bill Foss

Test Date: 1/23/2018

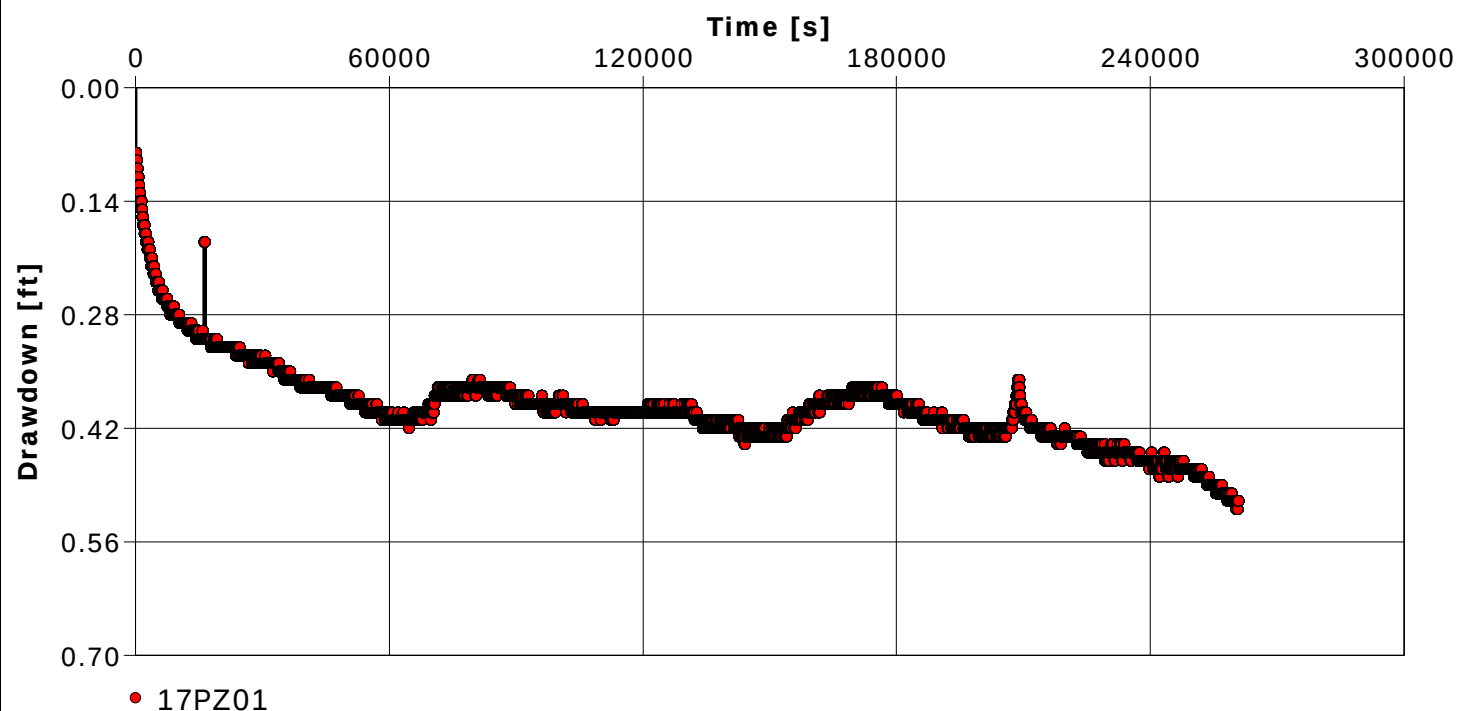
Analysis Performed by: WFoss

17PZ01 Time-Drawdown

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

Discharge Rate: 0.24 [U.S. gal/min]



**Figure 5-4 - 17PZ02 Time vs Drawdown**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Constant Rate Pumping Test

Pumping Well: 17WW02

Test Conducted by: Bill Foss

Test Date: 1/23/2018

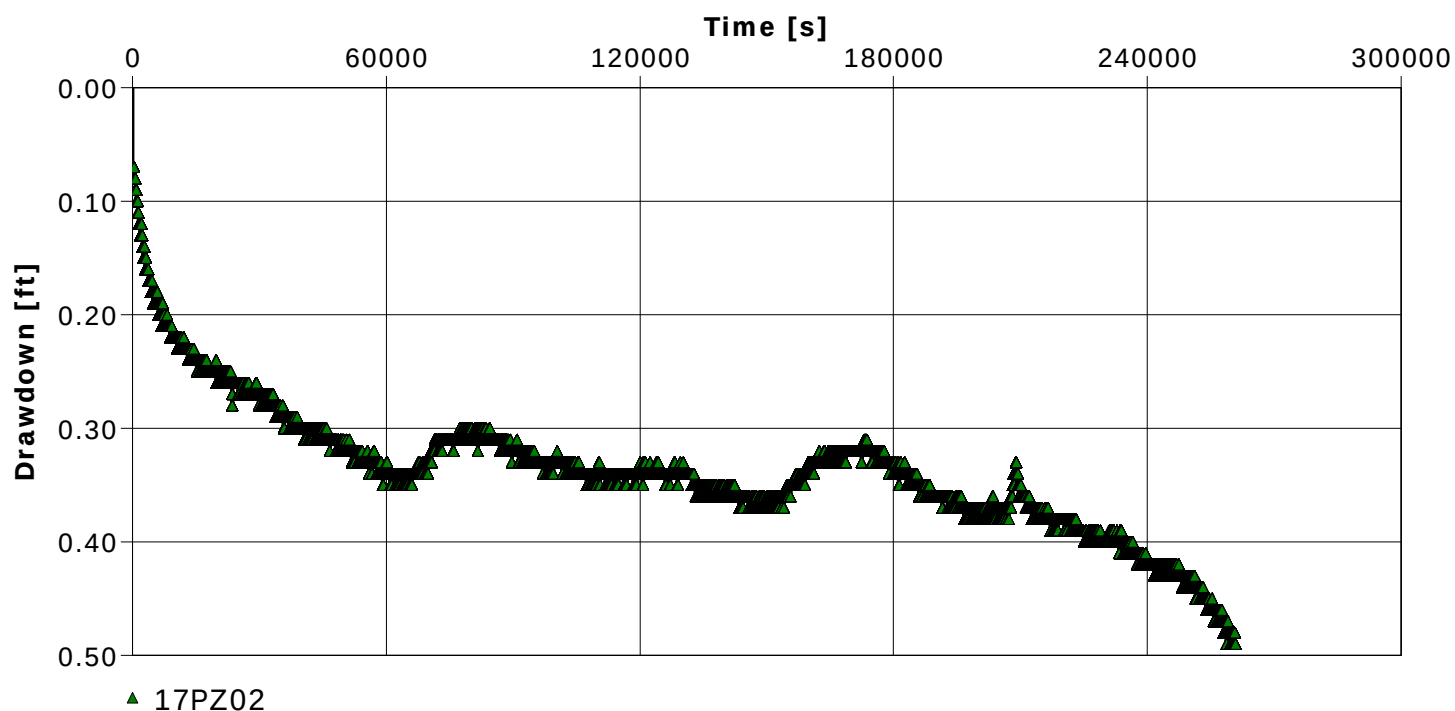
Analysis Performed by: WFoss

17PZ02 Time-Drawdown

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

Discharge Rate: 0.24 [U.S. gal/min]



**Figure 5-5 - 17PZ03 Time vs Drawdown**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17PZ03 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	

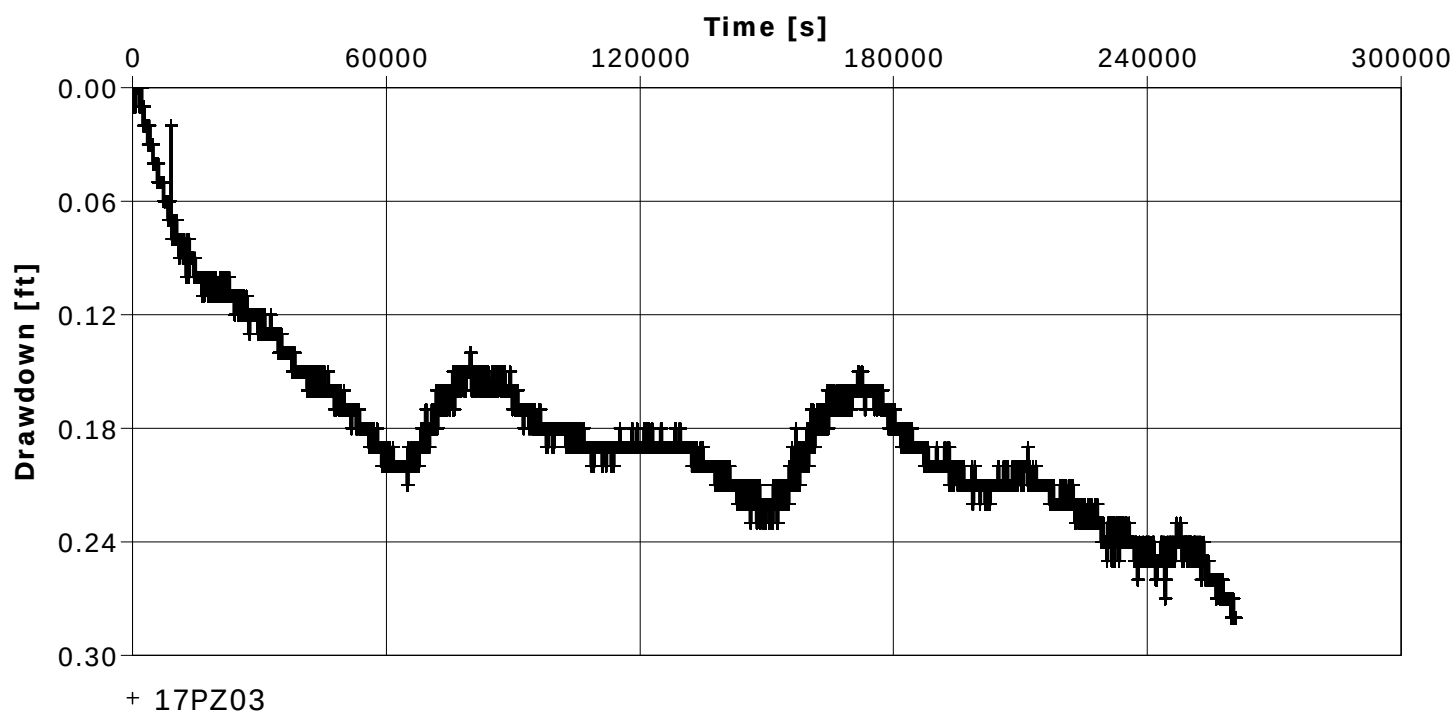


Figure 5-6
Ambient Water Level Measurements

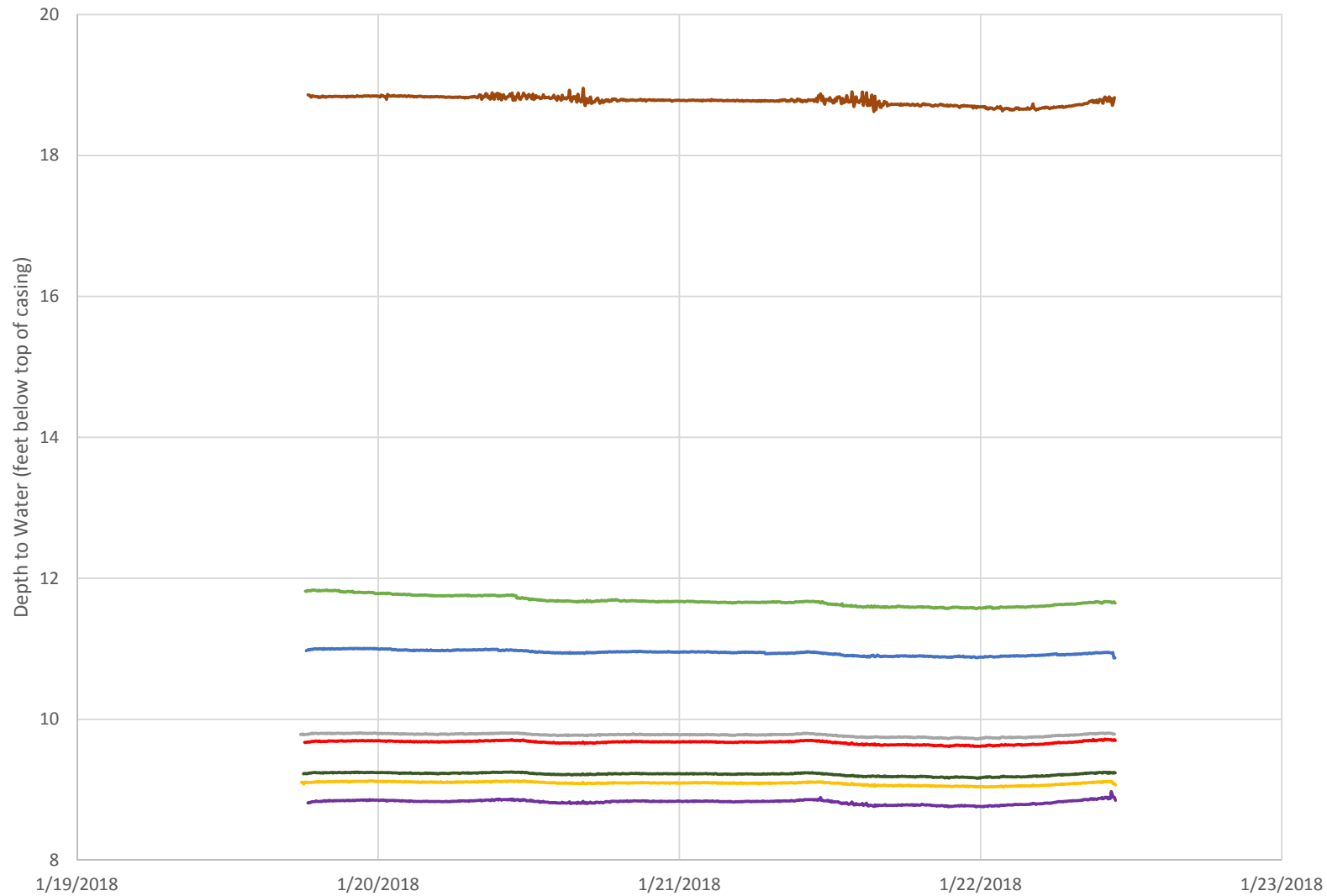


Figure 5-7
17WW02 Drawdown versus Pumping Rate

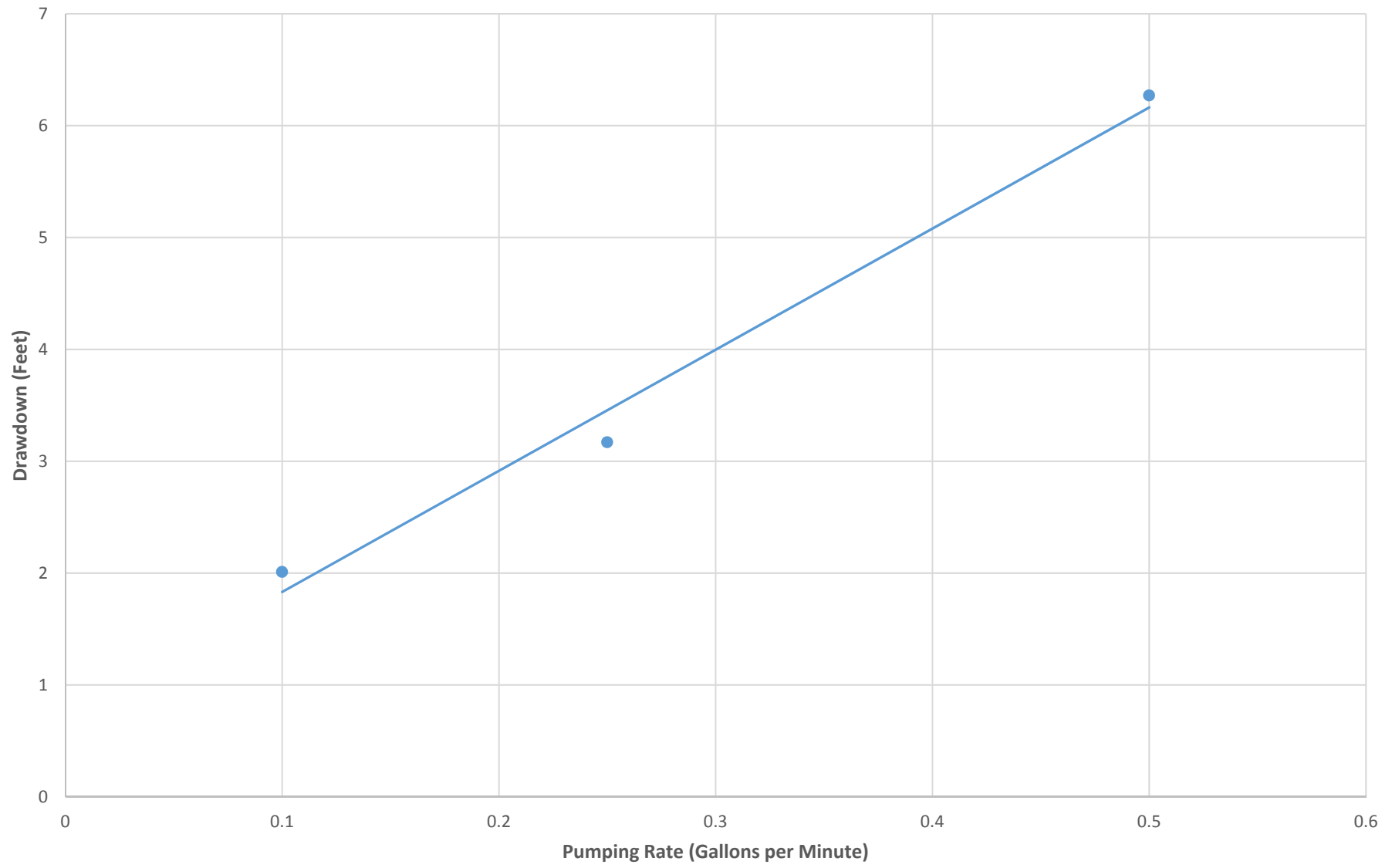



Figure 5-8 - 17WW02 Specific Capacity Solution

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Step Drawdown Test

Pumping Well: 17WW02

Test Conducted by: Bill Foss

Test Date: 1/22/2018

Analysis Performed by: WFoss

17WW02 - Specific capacity

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

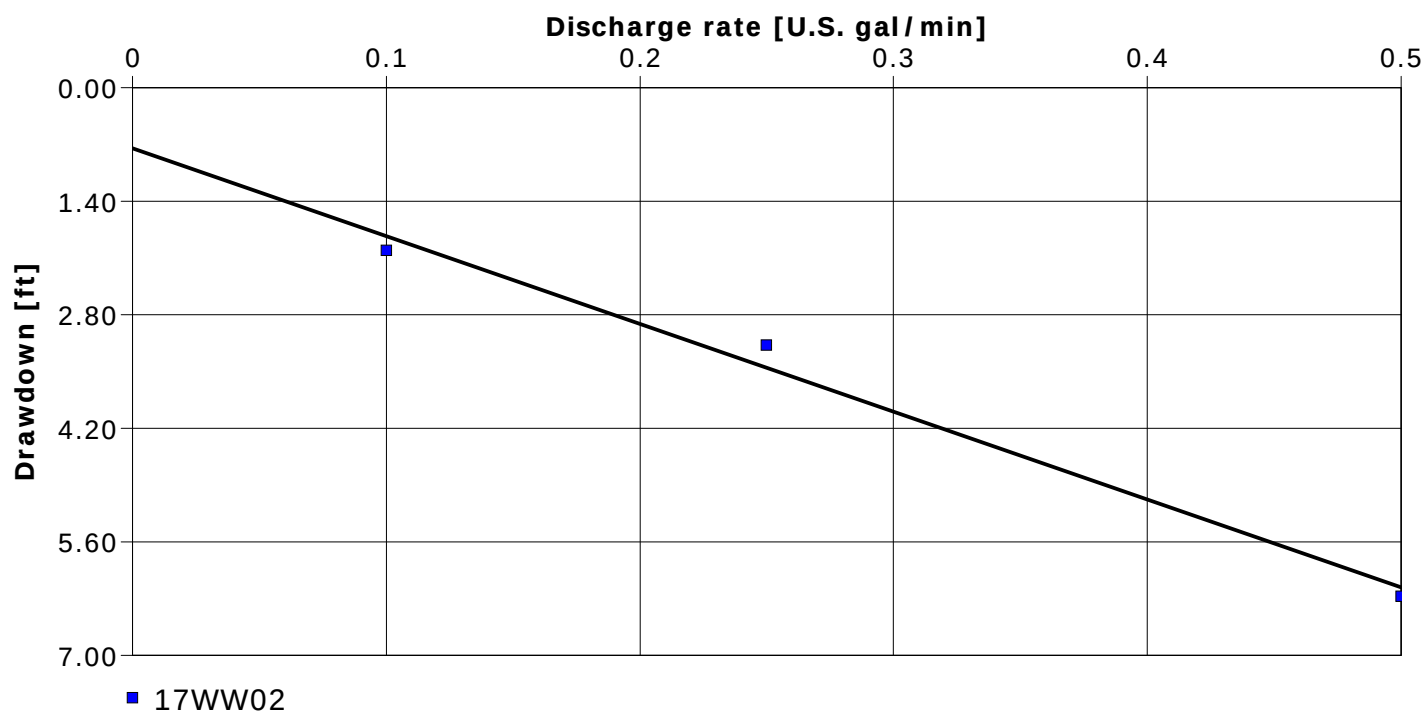
C [ft²/min]: 0.01235

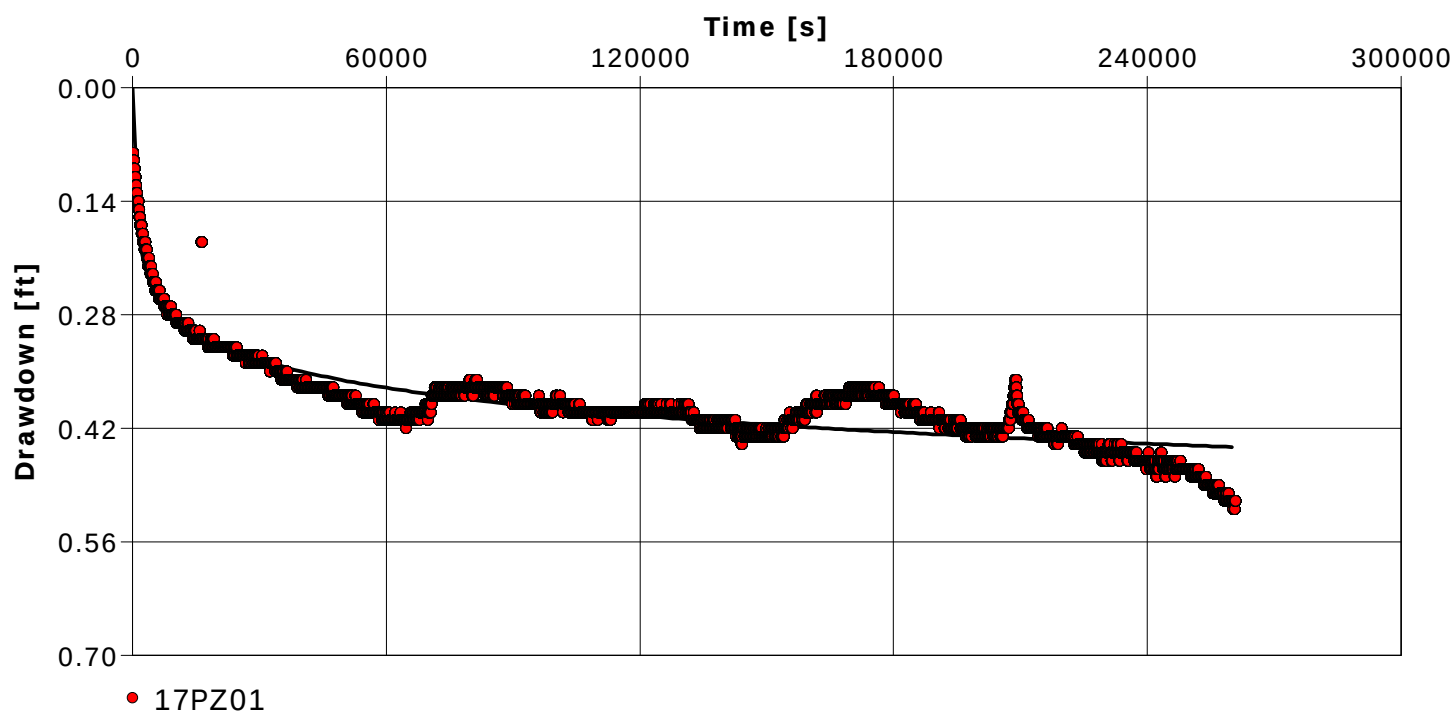

Figure 5-9 - 17PZ01 Constant-Rate Test Analysis

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17PZ01	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	



Calculation using Theis with Jacob Correction

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft ²]	Storage coefficient	Radial Distance to PW [ft]	
17PZ01	5.67×10^2	3.61×10^1	7.75×10^{-6}	90.0	


Figure 5-10 - 17PZ02 Constant-Rate Test Analysis

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Constant Rate Pumping Test

Pumping Well: 17WW02

Test Conducted by: Bill Foss

Test Date: 1/23/2018

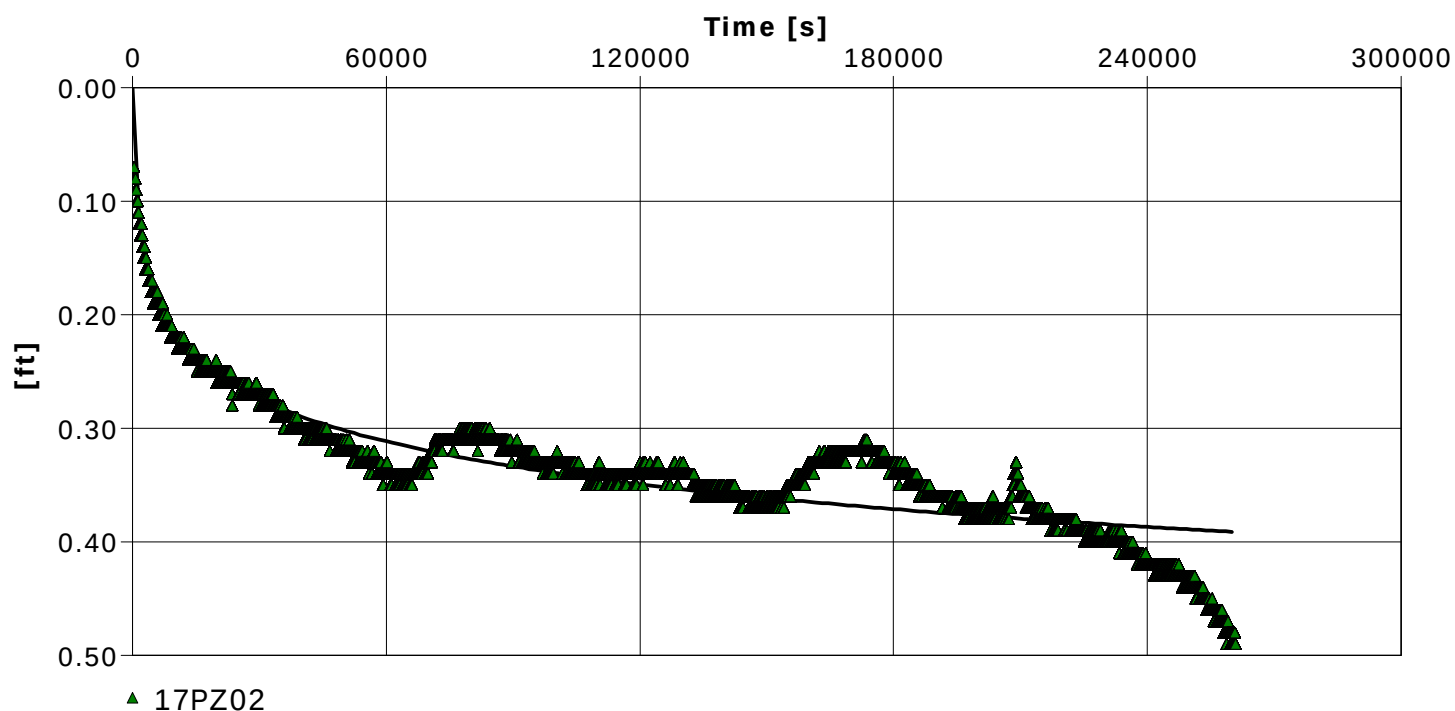
Analysis Performed by: WFoss

17PZ02

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

Discharge Rate: 0.24 [U.S. gal/min]



Calculation using Theis with Jacob Correction

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft ²]	Storage coefficient	Radial Distance to PW [ft]	
17PZ02	5.18×10^2	3.29×10^1	3.24×10^{-3}	10.0	

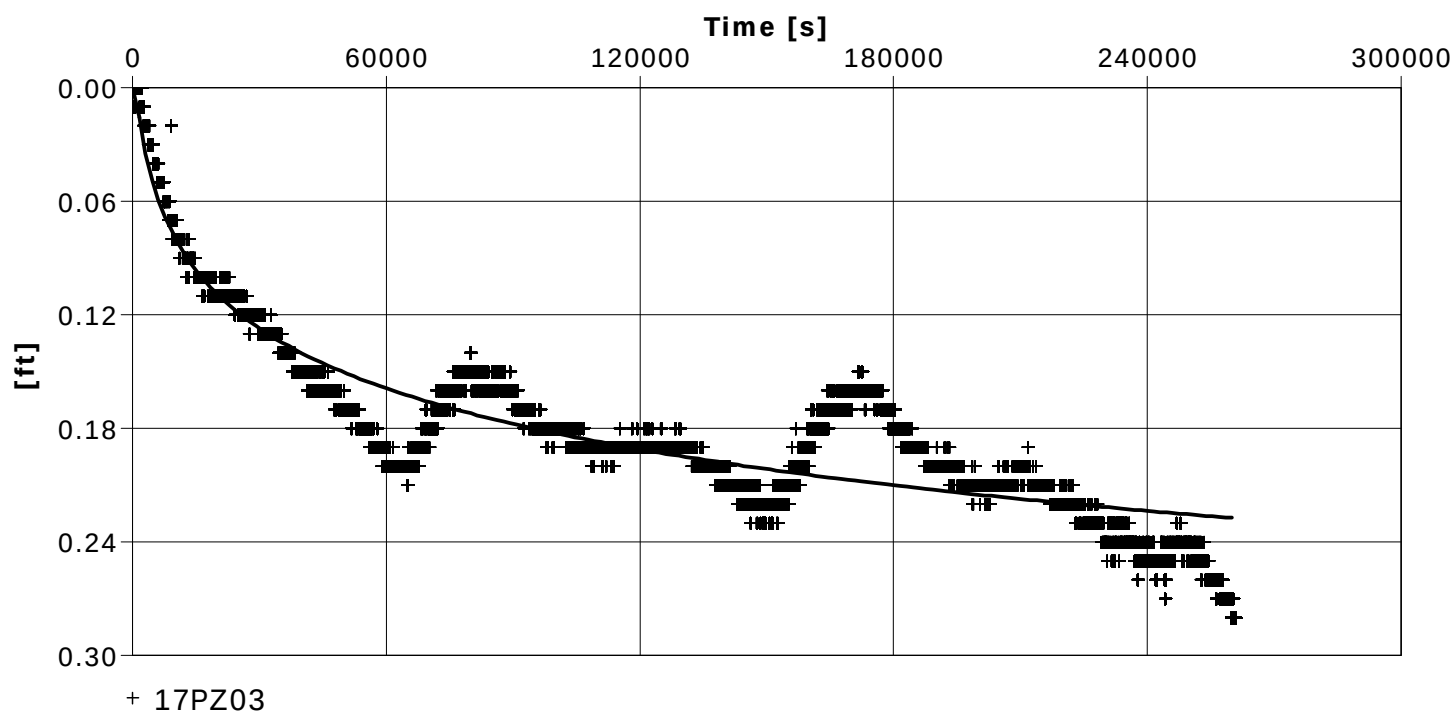

Figure 5-11 - 17PZ03 Constant-Rate Test Analysis

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17PZ03	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	



Calculation using Theis with Jacob Correction

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft ²]	Storage coefficient	Radial Distance to PW [ft]	
17PZ03	5.90×10^2	3.75×10^1	1.06×10^{-2}	20.0	


Figure 5-12 - 17PZ01 Recovery Test Analysis

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Recovery Test

Pumping Well: 17WW02

Test Conducted by: WFoss

Test Date: 3/27/2018

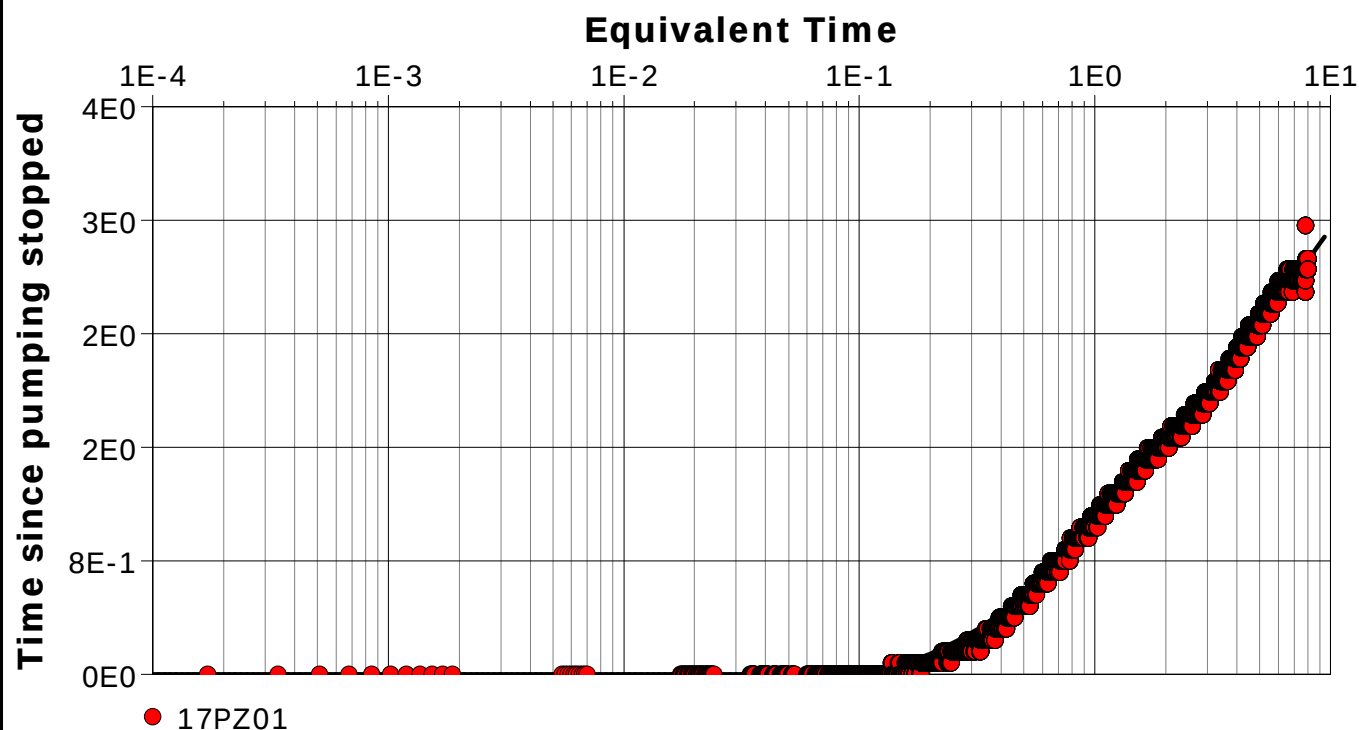
Analysis Performed by: WFoss

17PZ01 Recovery

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

Discharge: variable, average rate 0.24 [U.S. gal/min]



Calculation using AGARWAL + Theis with Jacob Correction

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft ²]	Storage coefficient	Radial Distance to PW [ft]	
17PZ01	2.20×10^2	1.40×10^1	2.46×10^{-4}	90.0	


Figure 5-13 - 17PZ02 Recovery Test Analysis

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17

Pumping Test: Recovery Test

Pumping Well: 17WW02

Test Conducted by: WFoss

Test Date: 3/27/2018

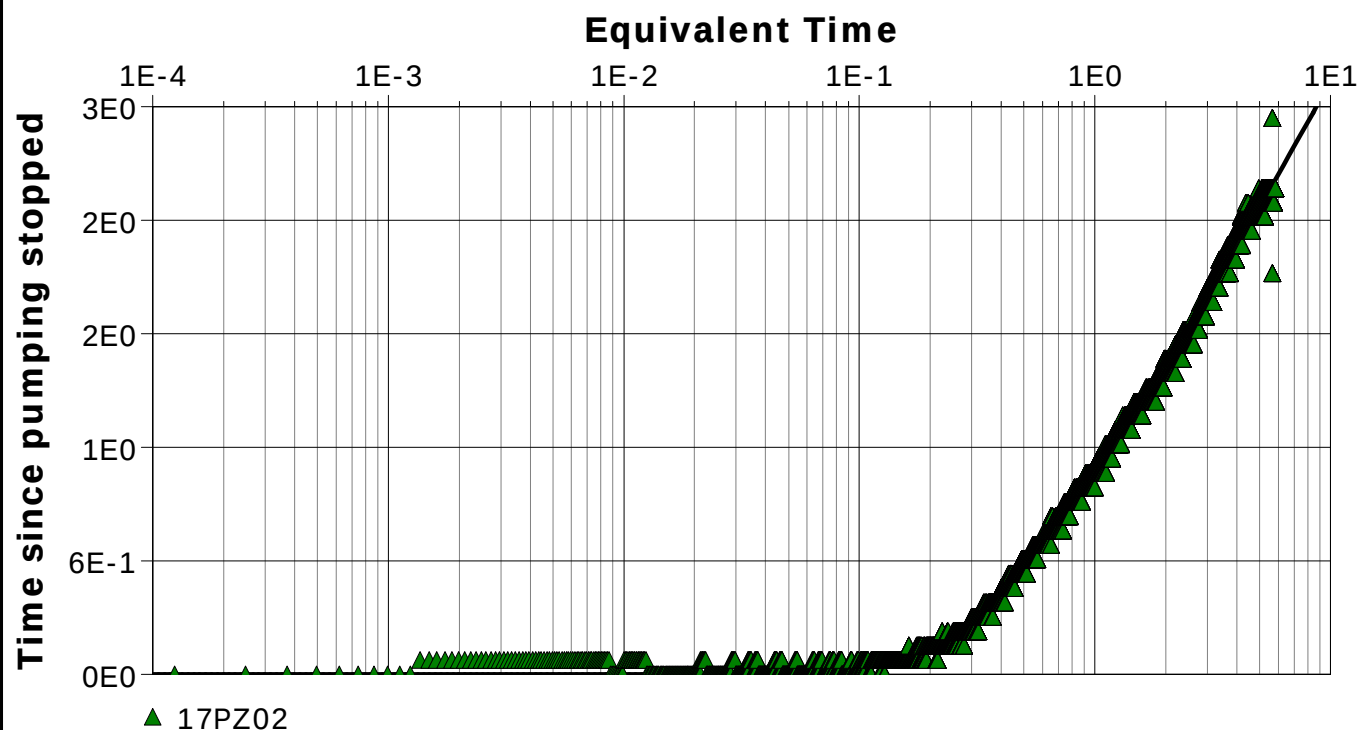
Analysis Performed by: WFoss

17PZ02 Recovery

Analysis Date: 3/27/2018

Aquifer Thickness: 15.73 ft

Discharge: variable, average rate 0.24 [U.S. gal/min]



Calculation using AGARWAL + Theis with Jacob Correction

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft ²]	Storage coefficient	Radial Distance to PW [ft]	
17PZ02	2.10×10^2	1.33×10^1	2.62×10^{-2}	10.0	

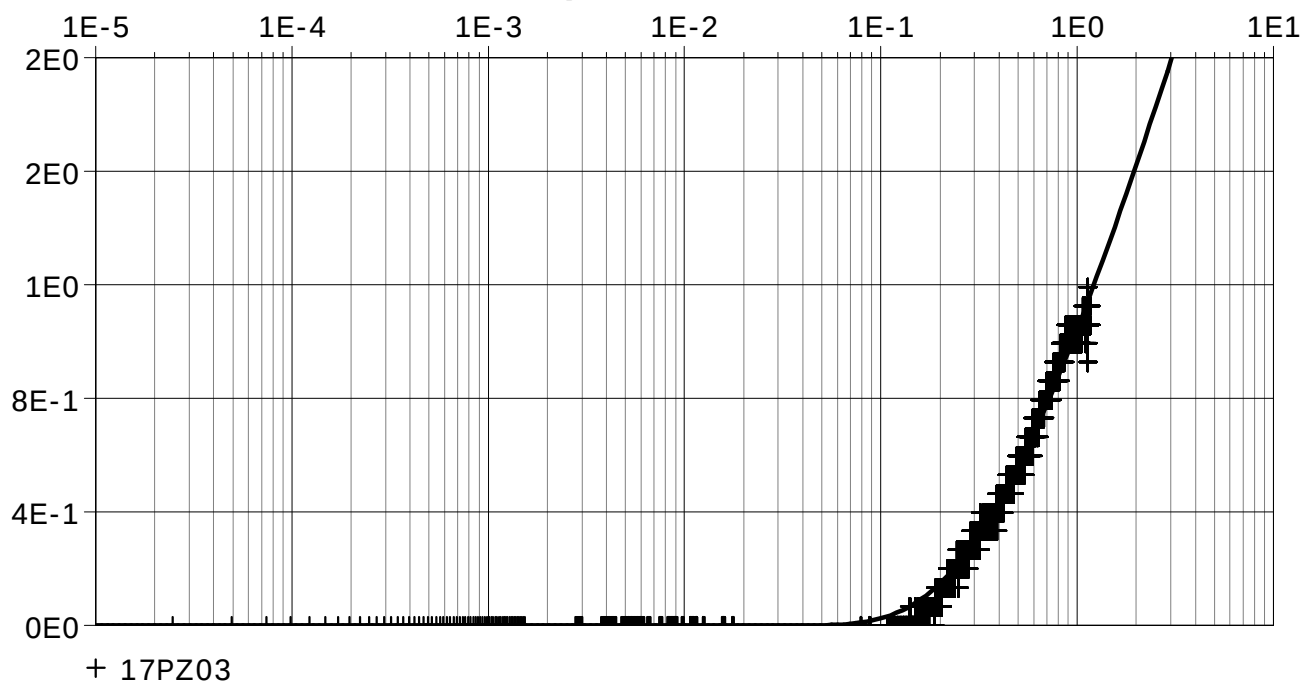

Figure 5-14 - 17PZ03 Recovery Test Analysis

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17PZ03 Recovery	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	

Equivalent Time


Calculation using AGARWAL + Theis with Jacob Correction

Observation Well	Transmissivity [U.S. gal/d-ft]	Hydraulic Conductivity [U.S. gal/d-ft ²]	Storage coefficient	Radial Distance to PW [ft]	
17PZ03	1.83×10^2	1.16×10^1	2.87×10^{-2}	20.0	

Appendix A

Groundwater and Soil Sample Collection Forms



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **130**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **130-111417**DATE/TIME: **11/14/2017 / 13:25**Sample Interval:
9 - 11.9 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/27/2018
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WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 2Purge Start Date/Time: 11/14/2017 / 12:50Depth to Water - Initial (DTWi) (ft) 9Purge End Date/Time: 11/14/2017 / 13:25Constructed Depth to Well Bottom (ft) 23PID Reading: 0.0Measured Depth of Well (ft): 25.5Screen Interval (ft): 8.00 - 23.00Pump Start Time: 11/14/2017 / 12:50



Sample Collection Log

2 of 2

Location ID: 130 Sample No: 130-111417

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
11/14/2017	12:55	200	2.0	11.65	3.474	20.70	6.82	0	-19.8	1.16
11/14/2017	13:05	200	4.0	11.80	3.426	21.11	6.53	0	-37.90	0.49
11/14/2017	13:10	200	5.0	11.80	3.420	21.22	6.50	0	-42.0	0.44
11/14/2017	13:15	200	6.0	11.87	3.378	21.25	6.52	0	-46.50	0.42
11/14/2017	13:20	200	7.0	11.85	3.356	21.28	6.50	0	-48.0	0.40
11/14/2017	13:25	200	8.0	11.90	3.350	21.26	6.50	0	-49.5	0.38



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW01**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW01-111517**DATE/TIME: **11/14/2017 / 13:35**Sample Interval:
11.05 - 11.65 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: 17WW01-111517-MS/MSD

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/14/2017 / 13:00Depth to Water - Initial (DTWi) (ft) 11.05Purge End Date/Time: 11/14/2017 / 13:35Constructed Depth to Well Bottom (ft) 31PID Reading: 0.0Measured Depth of Well (ft): 36.4Screen Interval (ft): 10.80 - 30.80Pump Start Time: 11/14/2017 / 13:00



Sample Collection Log

2 of 2

Location ID: 17WW01 Sample No: 17WW01-111517										
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
11/15/2017	13:05	180	0.9	11.50	6.342	20.96	7.83	0	-32.5	0.53
11/15/2017	13:15	180	2.7	11.50	6.341	21.00	6.62	0	0.0	0.45
11/15/2017	13:20	180	3.6	11.60	6.340	21.02	6.41	0	-6.0	0.41
11/15/2017	13:25	180	4.5	11.60	6.342	20.98	6.26	0	-4.2	0.43
11/15/2017	13:30	180	5.4	11.65	6.343	20.95	6.24	0	-3.8	0.42
11/15/2017	13:35	180	6.3	11.65	6.342	21.00	6.25	0	-4.3	0.44



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW02**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW02-111517**DATE/TIME: **11/15/2017 / 15:15**Sample Interval:
9 - 10.4 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: 17WW02-111517-FD

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 14:40Depth to Water - Initial (DTWi) (ft) 9Purge End Date/Time: 11/15/2017 / 15:15Constructed Depth to Well Bottom (ft) 24PID Reading: 0.0Measured Depth of Well (ft): 25Screen Interval (ft): 12.00 - 22.00Pump Start Time: 11/15/2017 / 14:40



Sample Collection Log

2 of 2

Location ID: 17WW02 Sample No: 17WW02-111517										
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
11/15/2017	14:45	180	0.9	10.10	0.958	21.95	6.78	15.0	1.08	1.08
11/15/2017	14:55	180	2.7	10.15	0.774	22.29	5.85	10.0	0.56	0.56
11/15/2017	15:00	180	3.6	10.25	0.770	22.46	5.82	5.0	0.66	0.66
11/15/2017	15:05	180	4.5	10.35	0.762	22.38	5.83	5.0	0.69	0.69
11/15/2017	15:10	180	5.4	10.40	0.785	22.81	5.78	0.0	0.79	0.79
11/15/2017	15:15	180	6.3	10.40	0.780	22.90	5.76	0.0	0.82	0.82



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW03**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW03-111417**DATE/TIME: **11/14/2017 / 14:20**Sample Interval:
11.1 - 11.65 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/14/2017 / 13:45Depth to Water - Initial (DTWi) (ft) 11.1Purge End Date/Time: 11/14/2017 / 14:20Constructed Depth to Well Bottom (ft) 32PID Reading: 0.0Measured Depth of Well (ft): 32Screen Interval (ft): 19.00 - 29.00Pump Start Time: 11/14/2017 / 13:45



Sample Collection Log

2 of 2

Location ID: 17WW03 Sample No: 17WW03-111417										
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
11/14/2017	13:50	180	1.8	11.40	3.785	21.74	6.69	50.4	-4.6	0.75
11/14/2017	14:00	180	3.6	11.50	3.795	21.7	6.31	32.2	-0.3	0.42
11/14/2017	14:05	180	4.5	11.50	3.834	21.97	3.25	15.0	-1.2	0.51
11/14/2017	14:10	180	5.4	11.55	3.954	22.29	6.23	10.0	-3.9	0.38
11/14/2017	14:15	180	6.3	11.65	3.999	22.39	6.22	11.5	-6.1	0.38
11/14/2017	14:20	180	7.2	11.65	4.025	22.49	6.23	11.3	-9.5	0.36



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW04**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

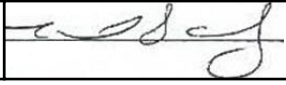
Mostly Cloudy. Air Temp:73. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW04-111617**DATE/TIME: **11/16/2017 / 10:35**Sample Interval:
12.35 - 12.7 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: 11-15-17 hand bailed 25 gallons of groundwater from well. MW had huge wasp nest in it. Cap on well was not properly seated. Lots of dead bugs in well. DTW prior to 'bailing well 12.30'.

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		Mike Martinez
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/16/2017 / 09:55Depth to Water - Initial (DTWi) (ft) 12.35Purge End Date/Time: 11/16/2017 / 10:35Constructed Depth to Well Bottom (ft) 37PID Reading: 0.0Measured Depth of Well (ft): 37.65Screen Interval (ft): 25.00 - 35.00Pump Start Time: 11/16/2017 / 09:55



Sample Collection Log

2 of 2

Location ID: 17WW04 Sample No: 17WW04-111617										
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
11/16/2017	10:00	100	1.0	12.60	0.580	19.86	9.45	26.3	-74.5	1.62
11/16/2017	10:10	100	2.0	12.70	0.559	19.87	8.88	26.4	-57.7	0.72
11/16/2017	10:15	100	2.5	12.70	0.558	19.85	8.77	18.5	-54.7	0.64
11/16/2017	10:20	100	3.0	12.70	0.558	19.90	8.69	18.9	-54.4	0.51
11/16/2017	10:25	100	3.5	12.70	0.558	19.92	8.68	19.5	-54.4	0.49
11/16/2017	10:30	100	4.0	12.70	0.558	19.92	8.67	15.1	-54.0	0.48
11/16/2017	10:35	100	4.5	12.70	0.558	19.92	8.65	14.8	-54.3	0.47



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW05**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

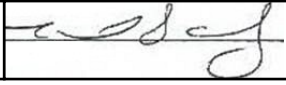
Mostly Cloudy. Air Temp: 73. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW05-111617**DATE/TIME: **11/16/2017 / 11:55**Sample Interval:
14.15 - 16.5 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		Mike Martinez
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/16/2017 / 11:00Depth to Water - Initial (DTWi) (ft) 14.15Purge End Date/Time: 11/16/2017 / 11:55Constructed Depth to Well Bottom (ft) 152PID Reading: 0.0Measured Depth of Well (ft): 154.3Screen Interval (ft): 142.00 - 152.00Pump Start Time: 11/16/2017 / 11:00



Sample Collection Log

2 of 2

Location ID: 17WW05 Sample No: 17WW05-111617										
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
11/16/2017	11:05	100	1.0	14.45	1.153	20.26	9.27	50.1	-6.2	2.75
11/16/2017	11:15	100	2.0	14.80	1.239	20.17	9.19	65.3	12.9	1.50
11/16/2017	11:20	100	2.5	15.40	1.260	20.11	9.09	39.1	33.6	0.88
11/16/2017	11:25	100	3.0	15.65	1.260	19.98	9.04	22.9	42.2	0.76
11/16/2017	11:30	100	3.5	15.90	1.260	19.97	9.03	12.8	50.2	0.76
11/16/2017	11:35	100	4.0	16.10	1.259	19.97	9.01	9.4	56.9	0.78
11/16/2017	11:40	100	4.5	16.45	1.258	20.00	8.98	8.2	57.8	0.74
11/16/2017	11:45	100	5.0	16.45	1.259	19.99	8.96	0.0	57.6	0.75
11/16/2017	11:50	100	5.5	16.48	1.258	19.98	8.95	0.0	58.1	0.74
11/16/2017	11:55	100	6.0	16.50	1.258	19.96	8.94	0.0	58.6	0.74



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW06**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW06-111617**DATE/TIME: **11/16/2017 / 12:35**Sample Interval:
11.7 - 11.95 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/16/2017 / 12:00Depth to Water - Initial (DTWi) (ft) 11.7Purge End Date/Time: 11/16/2017 / 12:35Constructed Depth to Well Bottom (ft) 22PID Reading: 0.0Measured Depth of Well (ft): 22.95Screen Interval (ft): 11.00 - 21.00Pump Start Time: 11/16/2017 / 12:00



Sample Collection Log

2 of 2

Location ID: 17WW06 Sample No: 17WW06-111617										
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
11/16/2017	12:05	180	0.9	11.85	3.651	20.43	6.08	11.0	46.4	1.03
11/16/2017	12:15	180	2.7	11.85	3.721	20.37	6.30	0.0	63.4	0.48
11/16/2017	12:20	180	3.6	11.85	3.723	20.37	6.34	0.0	79.8	0.51
11/16/2017	12:25	180	4.5	11.90	3.757	20.48	6.36	0.0	89.7	0.40
11/16/2017	12:30	180	5.4	11.90	3.723	20.47	6.38	0.0	95.0	0.41
11/16/2017	12:35	180	6.3	11.95	3.736	20.46	6.38	0.0	102.5	0.40



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW07**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW07-111417**DATE/TIME: **11/14/2017 / 11:55**Sample Interval:
11.65 - 12.1 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/14/2017 / 11:20Depth to Water - Initial (DTWi) (ft) 11.65Purge End Date/Time: 11/14/2017 / 11:55Constructed Depth to Well Bottom (ft) 52PID Reading: 0.0Measured Depth of Well (ft): 55.5Screen Interval (ft): 42.00 - 52.00Pump Start Time: 11/14/2017 / 11:20



Sample Collection Log

2 of 2

Location ID: 17WW07 Sample No: 17WW07-111417										
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
11/14/2017	11:25	200	2.0	12.00	0.320	19.85	7.69	0	-89.8	1.14
11/14/2017	11:35	200	4.0	12.00	0.302	19.70	7.98	0	-75.2	0.85
11/14/2017	11:40	200	5.0	12.00	0.283	19.75	8.27	0	-65.4	0.58
11/14/2017	11:45	200	6.0	12.05	0.260	19.79	8.51	0	-53.4	0.46
11/14/2017	11:50	200	7.0	12.05	0.255	19.80	8.59	0	-49.5	0.48
11/14/2017	11:55	200	8.0	12.10	0.256	19.85	8.60	0	-47.3	0.40



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW08**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW08-111417**DATE/TIME: **11/14/2017 / 11:00**Sample Interval:
11.45 - 12.15 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/14/2017 / 10:25Depth to Water - Initial (DTWi) (ft) 11.45Purge End Date/Time: 11/14/2017 / 11:00Constructed Depth to Well Bottom (ft) 34PID Reading: 0.0Measured Depth of Well (ft): 33.85Screen Interval (ft): 21.00 - 31.00Pump Start Time: 11/14/2017 / 10:25



Sample Collection Log

2 of 2

Location ID: 17WW08 Sample No: 17WW08-111417										
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
11/14/2017	10:30	180	1.8	12.00	2.793	19.19	6.47	0	27.0	1.68
11/14/2017	10:40	180	3.6	12.00	2.342	19.33	6.25	0	20.5	0.78
11/14/2017	10:45	180	4.5	12.10	2.857	19.52	6.13	0	19.5	0.43
11/14/2017	10:50	180	5.4	12.10	2.857	19.52	6.13	0	19.5	0.45
11/14/2017	10:55	180	6.3	12.15	2.864	19.38	6.11	0	21.5	0.40
11/14/2017	11:00	180	7.2	12.15	2.866	19.35	6.11	0	22.5	0.38



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW09**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW09-111517**DATE/TIME: **11/15/2017 / 17:05**Sample Interval:
13.65 - 14.58 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 16:30Depth to Water - Initial (DTWi) (ft) 13.65Purge End Date/Time: 11/15/2017 / 17:05Constructed Depth to Well Bottom (ft) 62PID Reading: 0.0Measured Depth of Well (ft): 54.3Screen Interval (ft): 41.00 - 51.00Pump Start Time: 11/15/2017 / 16:30



Sample Collection Log

2 of 2

Location ID: 17WW09 Sample No: 17WW09-111517										
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
11/15/2017	16:35	180	0.9	13.90	0.408	21.41	7.99	10.0	149	1.05
11/15/2017	16:45	180	2.7	14.15	0.385	21.31	7.09	10.2	138.9	1.00
11/15/2017	16:50	180	3.6	14.35	0.370	21.13	7.06	8.0	144.7	0.94
11/15/2017	16:55	180	4.5	14.45	0.352	21.11	6.99	7.6	142.5	0.88
11/15/2017	17:00	180	5.4	14.50	0.362	21.10	6.78	9.5	140	0.86
11/15/2017	17:05	180	6.3	14.58	0.383	21.03	6.76	10.0	139	0.81



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW10**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW10-111517**DATE/TIME: **11/15/2017 / 16:20**Sample Interval:
13.65 - 14.1 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 15:45Depth to Water - Initial (DTWi) (ft) 13.65Purge End Date/Time: 11/15/2017 / 16:20Constructed Depth to Well Bottom (ft) 31PID Reading: 0.0Measured Depth of Well (ft): 33.5Screen Interval (ft): 20.50 - 30.50Pump Start Time: 11/15/2017 / 15:45



Sample Collection Log

2 of 2

Location ID: 17WW10 Sample No: 17WW10-111517										
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
11/15/2017	15:50	180	0.9	13.85	1.258	21.51	7.59	25.0	116.8	4.44
11/15/2017	16:00	180	2.7	14.0	1.258	21.55	8.03	25.0	122.0	4.31
11/15/2017	16:05	180	3.6	14.0	1.261	21.44	8.30	15.0	128.1	3.98
11/15/2017	16:10	180	4.5	14.05	1.262	21.42	8.45	10.5	131.2	3.60
11/15/2017	16:15	180	5.4	14.05	1.263	21.31	8.47	10.0	132.2	3.58
11/15/2017	16:20	180	6.3	14.10	1.264	21.33	8.50	10.0	133.3	3.40



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW11**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW11-111617**DATE/TIME: **11/16/2017 / 11:35**Sample Interval:
12.3 - 13.2 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/27/2018
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WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/16/2017 / 00:00Depth to Water - Initial (DTWi) (ft) 12.3Purge End Date/Time: 11/16/2017 / 11:35Constructed Depth to Well Bottom (ft) 47PID Reading: 0.0Measured Depth of Well (ft): 48.85Screen Interval (ft): 36.00 - 46.00Pump Start Time: 11/16/2017 / 00:00



Sample Collection Log

2 of 2

Location ID: 17WW11 Sample No: 17WW11-111617										
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
11/16/2017	11:05	200	1.0	12.85	1.265	19.50	6.21	15.8	3.3	1.00
11/16/2017	11:15	200	3.0	12.90	1.279	19.44	6.00	10.6	-0.6	0.63
11/16/2017	11:20	200	4.0	13.10	1.274	19.38	5.94	10.5	2.3	0.51
11/16/2017	11:25	200	5.0	13.15	1.277	19.38	5.93	10.2	3.3	0.48
11/16/2017	11:30	200	6.0	13.15	1.268	19.53	5.90	8.80	3.9	0.38
11/16/2017	11:35	200	7.0	13.20	1.260	19.65	5.91	8.20	4.3	0.36



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW12**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

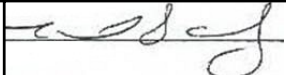
Cloudy. Air Temp: 61. Wind Speed: Still

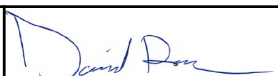
SAMPLING INFORMATION

Sample No: **17WW12-021518**DATE/TIME: **2/15/2018 / 10:40**Sample Interval:
11.63 - 12.35 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-FEB2018-GW-ALSHT-021518	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		Mike Martinez
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QC'ed By:		David Rowan	8/27/18
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WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 2/15/2018 / 09:50Depth to Water - Initial (DTWi) (ft) 11.63Purge End Date/Time: 2/15/2018 / 10:40Constructed Depth to Well Bottom (ft) 15PID Reading: 0.0Measured Depth of Well (ft): 17.2Screen Interval (ft): 5.00 - 15.00Pump Start Time: 2/15/2018 / 09:50



Sample Collection Log

2 of 2

Location ID: 17WW12 Sample No: 17WW12-021518										
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
2/15/2018	10:00	100	1.0	11.90	1.473	18.53	5.95	218.7	121.9	3.78
2/15/2018	10:10	100	2.0	12.06	1.473	19.05	5.80	132.8	134.1	2.68
2/15/2018	10:15	100	2.5	12.14	1.472	19.55	5.76	103.5	139.8	2.69
2/15/2018	10:20	100	3.0	12.24	1.472	19.63	5.76	91.6	140.1	2.70
2/15/2018	10:25	100	3.5	12.34	1.472	19.62	5.75	70.8	139.9	2.72
2/15/2018	10:30	100	4.0	12.35	1.470	19.64	5.75	69.8	141.0	2.71
2/15/2018	10:35	100	4.5	12.35	1.470	19.65	5.74	66.1	142.5	2.70
2/15/2018	10:40	100	5.0	12.35	1.469	19.67	5.73	68.5	143.8	2.70



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**

Location ID: **17WW12**

Project No: 501032

Sampler(s): **David Rowan**

FIELD CONDITIONS

SAMPLING INFORMATION

Sample No: 17WW12-111617

DATE/TIME: 11/16/2017 / 10:55

Sample Interval:
- Δt

Sampling Method: PP

Sample Purpose: REG

Sample Matrix: GW

Sample Notes: Dry Well

Chain of Custody	COC Notes	Analysis Group	Analytic Method
No COC Specified	None		

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing

Purging Method/Equipment:

Casing ID (in.): 4

Purge Start Date/Time: - / -

Depth to Water - Initial (DTWi) (ft)

Purge End Date/Time: 11/16/2017 / 10:55

Constructed Depth to Well Bottom (ft) 15

PID Reading: 0.0

Measured Depth of Well (ft): 17

Screen Interval (ft): 5.00 - 15.00

Pump Start Time:

[illegible]



Sample Collection Log

2 of 2

00898227



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW13**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW13-111417**DATE/TIME: **11/14/2017 / 12:35**Sample Interval:
11 - 11.6 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/14/2017 / 12:00Depth to Water - Initial (DTWi) (ft) 11Purge End Date/Time: 11/14/2017 / 12:35Constructed Depth to Well Bottom (ft) 32PID Reading: 0.0Measured Depth of Well (ft): 34.1Screen Interval (ft): 21.50 - 31.50Pump Start Time: 11/14/2017 / 12:00



Sample Collection Log

2 of 2

Location ID: 17WW13 Sample No: 17WW13-111417										
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
11/14/2017	12:05	200	2.0	11.35	1.641	21.20	7.96	0	-39.1	2.68
11/14/2017	12:15	200	4.0	11.40	1.668	21.63	7.62	0	-76.0	1.03
11/14/2017	12:20	200	5.0	11.55	1.684	21.56	7.44	0	-86.1	0.53
11/14/2017	12:25	200	6.0	11.60	1.694	21.53	7.42	0	-89.2	0.58
11/14/2017	12:30	200	7.0	11.60	1.698	21.92	7.40	0	-83.2	0.50
11/14/2017	12:35	200	8.0	11.60	1.700	21.99	7.38	0	-80.2	0.45



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW14**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

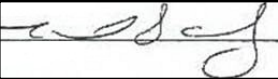
Mostly Cloudy. Air Temp:72. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW14-111517**DATE/TIME: **11/15/2017 / 14:25**Sample Interval:
13.95 - 14.32 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		Mike Martinez
QC'ed By:		David Rowan

8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 13:50Depth to Water - Initial (DTWi) (ft) 13.95Purge End Date/Time: 11/15/2017 / 14:25Constructed Depth to Well Bottom (ft) 24PID Reading: 0.0Measured Depth of Well (ft): 26.46Screen Interval (ft): 13.00 - 23.00Pump Start Time: 11/15/2017 / 13:50



Sample Collection Log

2 of 2

Location ID: 17WW14 Sample No: 17WW14-111517										
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
11/15/2017	13:55	100	2.0	14.30	3.343	20.93	8.37	74.1	229.3	1.37
11/15/2017	14:05	100	3.0	14.32	3.326	20.94	8.33	32.3	227.0	0.76
11/15/2017	14:10	100	3.5	14.32	3.279	21.00	8.22	25.4	229.1	0.50
11/15/2017	14:15	100	4.0	14.32	3.286	21.05	8.20	22.9	230.6	0.49
11/15/2017	14:20	100	4.5	14.32	3.282	21.09	8.19	22.5	231.5	0.48
11/15/2017	14:25	100	5.0	14.32	3.276	21.07	8.17	22.8	233.0	0.48



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW15**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

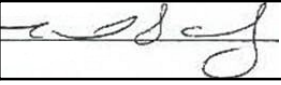
Mostly Cloudy. Air Temp:72. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW15-111517**DATE/TIME: **11/15/2017 / 15:55**Sample Interval:
15.15 - 17.26 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		Mike Martinez
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 15:00Depth to Water - Initial (DTWi) (ft) 15.15Purge End Date/Time: 11/15/2017 / 15:55Constructed Depth to Well Bottom (ft) 54PID Reading: 0.0Measured Depth of Well (ft): 54.85Screen Interval (ft): 43.00 - 53.00Pump Start Time: 11/15/2017 / 15:00



Sample Collection Log

2 of 2

Location ID: 17WW15 Sample No: 17WW15-111517										
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
11/15/2017	15:05	100		15.45	0.559	20.24	8.74	9.0	262.4	1.76
11/15/2017	15:15	100	2.0	16.05	0.516	20.02	8.85	0.2	264.1	0.86
11/15/2017	15:20	100	2.5	16.40	0.511	19.88	8.88	0.0	256.9	0.85
11/15/2017	15:25	100	3.0	16.60	0.509	19.89	8.89	0.0	250.3	0.85
11/15/2017	15:30	100	3.5	16.80	0.507	19.90	8.92	0.0	246.9	0.85
11/15/2017	15:35	100	4.0	16.95	0.506	19.89	8.91	0.0	243.4	0.98
11/15/2017	15:40	100	4.5	17.15	0.504	19.87	8.93	0.0	224.1	1.00
11/15/2017	15:45	100	5.0	17.25	0.494	19.84	9.09	0.0	168.6	1.13
11/15/2017	15:50	100	5.5	17.25	0.490	19.89	9.07	0.0	175.1	1.16
11/15/2017	15:55	100	6.0	17.26	0.491	19.89	9.07	0.0	178.3	1.17



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW16**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

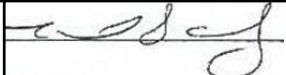
Mostly Cloudy. Air Temp: 72. Wind Speed: Still

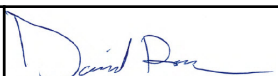
SAMPLING INFORMATION

Sample No: **17WW16-111517**DATE/TIME: **11/15/2017 / 17:30**Sample Interval:
13.15 - 13.5 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		Mike Martinez
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QC'ed By:		David Rowan	8/27/2018
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WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 16:45Depth to Water - Initial (DTWi) (ft) 13.15Purge End Date/Time: 11/15/2017 / 17:30Constructed Depth to Well Bottom (ft) 155PID Reading: 0.0Measured Depth of Well (ft): 152.75Screen Interval (ft): 141.00 - 151.00Pump Start Time: 11/15/2017 / 16:45



Sample Collection Log

2 of 2

Location ID: 17WW16 Sample No: 17WW16-111517										
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
11/15/2017	16:50	100	1.0	13.50	1.326	19.59	10.08	50.9	141.7	1.54
11/15/2017	17:00	100	2.0	13.90	1.331	19.57	10.10	45.1	138.1	1.28
11/15/2017	17:05	100	2.5	14.10	1.340	19.55	10.11	44.6	135.0	1.22
11/15/2017	17:10	100	3.0	14.50	1.351	19.57	10.06	53.4	132.6	0.93
11/15/2017	17:15	100	3.5	14.80	1.351	19.57	10.04	43.9	123.1	0.76
11/15/2017	17:20	100	4.0	15.20	1.353	19.58	10.00	48.1	119.1	0.73
11/15/2017	17:25	100	4.5	15.30	1.353	19.58	9.98	49.1	118.1	0.72
11/15/2017	17:30	100	5.0	15.58	1.353	19.58	9.97	43.9	117.1	0.71



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW17**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:70. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW17-111517**DATE/TIME: **11/15/2017 / 14:20**Sample Interval:
11.25 - 12.8 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: 17WW17-111517-FD

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 13:45Depth to Water - Initial (DTWi) (ft) 11.25Purge End Date/Time: 11/15/2017 / 14:20Constructed Depth to Well Bottom (ft) 52PID Reading: 0.0Measured Depth of Well (ft): 53.8Screen Interval (ft): 42.00 - 52.00Pump Start Time: 11/15/2017 / 13:45



Sample Collection Log

2 of 2

Location ID: 17WW17 Sample No: 17WW17-111517										
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
11/15/2017	13:50	200	1	12.50	0.365	21.40	6.99	0	97.1	1.69
11/15/2017	14:00	200	3.0	12.50	0.234	21.11	6.40	0	145.9	1.51
11/15/2017	14:05	200	4.0	12.60	0.228	21.05	6.25	0	157.9	1.51
11/15/2017	14:10	200	5.0	12.65	0.224	21.10	6.20	0	163.2	1.51
11/15/2017	14:15	200	6.0	12.75	0.223	21.10	6.20	0	163.9	1.51
11/15/2017	14:20	200	7.0	12.80	0.222	20.90	6.22	0	159.8	1.51



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW18**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **17WW18-111517**DATE/TIME: **11/15/2017 / 11:45**Sample Interval:
11.115 - 12.18 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	VOLATILES	SW8260B
		PERCHLORATE	6850

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/15/2017 / 11:10Depth to Water - Initial (DTWi) (ft) 11.15Purge End Date/Time: 11/15/2017 / 11:45Constructed Depth to Well Bottom (ft) 54PID Reading: 0.0Measured Depth of Well (ft): 56.4Screen Interval (ft): 44.00 - 54.00Pump Start Time: 11/15/2017 / 11:10



Sample Collection Log

2 of 2

Location ID: 17WW18 Sample No: 17WW18-111517										
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
11/15/2017	11:15	200	1.0	11.80	1.598	20.90	11.13	0	33.7	4.44
11/15/2017	11:25	200	3.0	11.90	1.662	20.99	11.41	0	20.9	4.33
11/15/2017	11:30	200	4.0	12.05	1.675	21.12	11.43	0	20.3	4.32
11/15/2017	11:35	200	5.0	12.15	1.695	21.21	11.42	0	21.7	4.30
11/15/2017	11:40	200	6.0	12.15	1.688	21.22	11.40	0	22.6	4.24
11/15/2017	11:45	200	7.0	12.18	1.689	21.23	11.40	0	23.2	4.22



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW19**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp:60. Wind Speed:Slight Winds

SAMPLING INFORMATION

Sample No: **17WW19-011518**DATE/TIME: **1/15/2018 / 11:05**Sample Interval:
12.55 - 14.35 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: FD & MS/MSD Collected, 17WW19-011518-FD, 17WW19-011518-MS, 17WW19-011518-MSD

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN2018-GW-ALSHT-011518	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/27/2018
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WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 1/15/2018 / 10:30Depth to Water - Initial (DTWi) (ft) 12.55Purge End Date/Time: 1/15/2018 / 11:05Constructed Depth to Well Bottom (ft) 25PID Reading: 0.0Measured Depth of Well (ft): 27.95Screen Interval (ft): -99.00 - -99.00Pump Start Time: 1/15/2018 / 10:30



Sample Collection Log

2 of 2

Location ID: 17WW19 Sample No: 17WW19-011518										
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
1/15/2018	10:35	200		12.55	0.415	16.56	8.52	20	89.2	5.59
1/15/2018	10:45	200		13.65	0.402	17.10	8.22	30	105.2	5.50
1/15/2018	10:50	200		14.00	0.401	17.29	8.02	25	111.2	5.52
1/15/2018	10:55	200		14.25	0.399	17.15	7.93	35	112.5	5.43
1/15/2018	11:00	200		14.28	0.398	17.13	7.90	25	113.9	5.90
1/15/2018	11:05	200		14.35	0.399	17.14	7.90	20	113.6	5.38



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **17WW20**Project No: **501032**Sampler(s): **Allen Willmore**

FIELD CONDITIONS

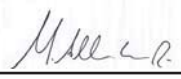
Sunny, Air Temp:88, Wind Speed:Still

SAMPLING INFORMATION

Sample No: **17WW20-180508**DATE/TIME: **5/8/2018 / 12:55**Sample Interval:
10.06 - 10.08 FtSampling Method: **LF**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes: New well

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-MAY2018-GW-ALSHT-180501	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		Allen Willmore	
QC'ed By:		Allen Willmore	08/28/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of Casing CasingPurging Method/Equipment: Peristaltic PumpID (in.): 4Purge Start Date/Time: 5/8/2018 / 12:20Depth to Water - Initial (DTWi) (ft) 10.06Purge End Date/Time: 5/8/2018 / 12:55Constructed Depth to Well Bottom (ft):31PID Reading: 0.0Measured Depth of Well (ft): 32Screen Interval (ft): 18-28Pump Start Time: 5/8/2018 / 12:20



Sample Collection Log

2 of 2

Location ID: 17WW20 Sample No: 17WW20-180508										
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
5/8/2018	12:25	100	0.5	10.06	3.04	19.74	5.92	28.1	70.1	3.20
5/8/2018	12:30	100	1	10.08	3.035	19.78	5.91	19.3	63.1	3.10
5/8/2018	12:35	100	1.5	10.08	3.014	19.8	5.9	16.4	56.3	3.01
5/8/2018	12:40	100	2	10.08	3.012	19.81	5.87	15.1	52.5	2.96
5/8/2018	12:45	100	2.5	10.08	3.012	19.81	5.87	14.4	51.1	2.91
5/8/2018	12:50	100	3	10.08	3.011	19.82	5.87	14.2	50.2	2.90



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **18WW10**Project No: **501032**Sampler(s): **Mike Martinez**

FIELD CONDITIONS

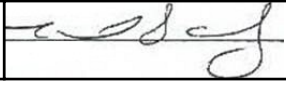
Mostly Cloudy. Air Temp:72. Wind Speed:Still

SAMPLING INFORMATION

Sample No: **18WW10-111517**DATE/TIME: **11/15/2017 / 12:05**Sample Interval:
15.1 - 15.98 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		Mike Martinez
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): -99Purge Start Date/Time: 11/15/2017 / 11:25Depth to Water - Initial (DTWi) (ft) 15.1Purge End Date/Time: 11/15/2017 / 12:05Constructed Depth to Well Bottom (ft) 36PID Reading: 0.0Measured Depth of Well (ft): 35.15Screen Interval (ft): 22.00 - 32.00Pump Start Time: 11/15/2017 / 11:25



Sample Collection Log

2 of 2

Location ID: 18WW10 Sample No: 18WW10-111517										
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
11/15/2017	11:30	100	1.0	15.80	1.220	19.83	5.90	0.0	200.1	2.43
11/15/2017	11:40	100	2.0	15.95	1.206	20.07	6.52	0.0	268.9	0.81
11/15/2017	11:45	100	2.5	15.98	1.201	20.05	6.15	0.0	265.9	0.68
11/15/2017	11:50	100	3.0	15.98	1.209	20.18	6.33	0.0	273.1	0.68
11/15/2017	11:55	100	3.5	15.98	1.206	20.22	6.71	0.0	274.6	0.52
11/15/2017	12:00	100	4.0	15.98	1.203	20.24	6.73	0.0	270.1	0.52
11/15/2017	12:05	100	4.5	15.98	1.207	20.23	6.74	0.0	269.3	0.54



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **18WW14**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **18WW14-111617**DATE/TIME: **11/16/2017 / 09:55**Sample Interval:
18.7 - 18.9 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/16/2017 / 09:20Depth to Water - Initial (DTWi) (ft) 18.7Purge End Date/Time: 11/16/2017 / 09:55Constructed Depth to Well Bottom (ft) 27PID Reading: 0.0Measured Depth of Well (ft): 36.1Screen Interval (ft): 17.00 - 27.00Pump Start Time: 11/16/2017 / 09:20



Sample Collection Log

2 of 2

Location ID: 18WW14 Sample No: 18WW14-111617										
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
11/16/2017	09:25	160	0.8	18.80	0.747	18.98	6.68	22.0	136.9	1.60
11/16/2017	09:35	160	2.4	18.80	0.808	19.05	6.09	20.0	129.1	1.31
11/16/2017	09:40	160	3.2	18.80	0.833	19.10	6.00	18.0	129.0	0.86
11/16/2017	09:45	160	4.0	18.80	0.848	19.09	6.00	11.80	130.2	0.68
11/16/2017	09:50	160	4.8	18.85	0.865	19.08	5.95	10.0	131.0	0.56
11/16/2017	09:55	160	5.6	18.90	0.859	19.12	5.93	10.2	132.5	0.52



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **18WW15**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **18WW15-111617**DATE/TIME: **11/16/2017 / 10:45**Sample Interval:
18.45 - 18.9 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/16/2017 / 10:10Depth to Water - Initial (DTWi) (ft) 18.45Purge End Date/Time: 11/16/2017 / 10:45Constructed Depth to Well Bottom (ft) 56PID Reading: 0.0Measured Depth of Well (ft): 56.6Screen Interval (ft): 44.00 - 54.00Pump Start Time: 11/16/2017 / 10:10



Sample Collection Log

2 of 2

Location ID: 18WW15 Sample No: 18WW15-111617										
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
11/16/2017	10:15	180	0.9	18.80	0.600	19.28	6.44	20.0	-12.0	0.67
11/16/2017	10:25	180	2.7	18.80	0.600	19.25	6.50	20.0	-38.5	0.52
11/16/2017	10:30	180	3.6	18.80	0.594	19.20	6.55	20.0	-47.2	0.41
11/16/2017	10:35	180	4.5	18.85	0.595	19.15	6.57	20.0	-45.5	0.48
11/16/2017	10:40	180	5.4	18.85	0.596	19.15	6.58	20.0	-44.3	0.51
11/16/2017	10:45	180	6.3	18.90	0.599	19.10	6.56	20.0	-42.8	0.52



Sample Collection Log

1 of 2

Project Name: **Longhorn AAP**Location ID: **C-07**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS

Cloudy. Air Temp: 70. Wind Speed: Still

SAMPLING INFORMATION

Sample No: **C-07-111417**DATE/TIME: **11/14/2017 / 10:10**Sample Interval:
28.55 - 28.95 FtSampling Method: **PP**Sample Purpose: **REG**Sample Matrix: **GW**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-NOV2017-GW-ALSHT-111417	None	PERCHLORATE	6850
		VOLATILES	SW8260B

Sampler:		David Rowan
QC'ed By:		David Rowan
		8/27/2018

WELL AND PURGING INFORMATION

Measuring Point : Top of CasingPurging Method/Equipment: Peristaltic PumpCasing ID (in.): 4Purge Start Date/Time: 11/14/2017 / 09:30Depth to Water - Initial (DTWi) (ft) 28.55Purge End Date/Time: 11/14/2017 / 10:10Constructed Depth to Well Bottom (ft) 36PID Reading: 0.0Measured Depth of Well (ft): 36.7Screen Interval (ft): 20.00 - 30.00Pump Start Time: 11/14/2017 / 09:30



Sample Collection Log

2 of 2

Location ID: C-07 Sample No: C-07-111417										
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
11/14/2017	09:40	150	1.5	28.80	0.616	18.81	7.38	25.3	113.5	3.15
11/14/2017	09:50	150	3.0	28.85	0.597	19.02	7.24	18.6	147.5	3.06
11/14/2017	09:55	150	3.75	28.85	0.589	19.16	6.70	20.5	157.7	3.04
11/14/2017	10:00	150	4.53	28.90	0.585	19.20	6.75	18.3	160.7	3.03
11/14/2017	10:05	150	5.25	28.90	0.583	19.22	6.70	17.2	162.3	3.04
11/14/2017	10:10	150	6.00	28.95	0.578	19.30	6.65	17.2	165.0	3.04



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB02A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB02A-11.0-13.0**DATE/TIME: **1/12/2018 / 08:15**Sample Interval:
11 - 13 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**Sample Notes: **17SB02A-11.0-13.0-FD**

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB02A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SB02A-13.0-15.0

DATE/TIME: 1/12/2018 / 08:17

Sample Interval:
13 - 15 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB03A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SB03A-10.0-12.0

DATE/TIME: 1/12/2018 / 11:08

Sample Interval:
10 - 12 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

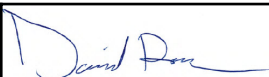
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB03A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB03A-12.5-14.5**DATE/TIME: **1/12/2018 / 11:10**Sample Interval:
12.5 - 14.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

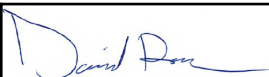
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB03A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB03A-7.5-9.5**DATE/TIME: **1/12/2018 / 11:06**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB04A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SB04A-10.0-12.0

DATE/TIME: 1/12/2018 / 13:42

Sample Interval:
10 - 12 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

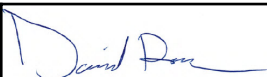
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB04A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB04A-2.5-4.5**DATE/TIME: **1/12/2018 / 13:36**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB04A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SB04A-5.0-7.0

DATE/TIME: 1/12/2018 / 13:38

Sample Interval:
5 - 7 Ft

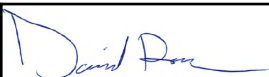
Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

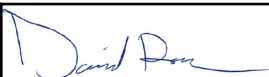
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB04A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB04A-7.5-9.5**DATE/TIME: **1/12/2018 / 13:40**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

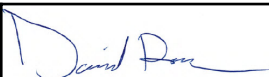
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB06A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB06A-10.0-12.0**DATE/TIME: **1/12/2018 / 16:07**Sample Interval:
10 - 12 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB06A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB06A-12.5-14.5**DATE/TIME: **1/12/2018 / 16:09**Sample Interval:
12.5 - 14.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

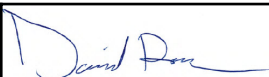
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SB06A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SB06A-7.5-9.5**DATE/TIME: **1/12/2018 / 16:05**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS21A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS21A-0.0-2.0**DATE/TIME: **1/11/2018 / 09:05**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS21A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS21A-3.0-5.0**DATE/TIME: **1/11/2018 / 09:05**Sample Interval:
3 - 5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS21A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS21A-5.0-7.0**DATE/TIME: **1/11/2018 / 09:06**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

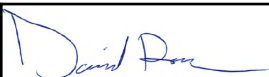
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS22A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS22A-3.0-5.0**DATE/TIME: **1/11/2018 / 08:40**Sample Interval:
3 - 5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS22A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS22A-5.0-7.0

DATE/TIME: 1/11/2018 / 08:42

Sample Interval:
5 - 7 Ft

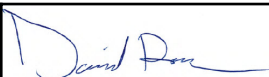
Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

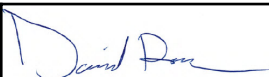
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS22A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS22A-7.0-9.0**DATE/TIME: **1/11/2018 / 08:45**Sample Interval:
7 - 9 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS23A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS23A-5.0-7.0

DATE/TIME: 1/11/2018 / 08:25

Sample Interval:
5 - 7 Ft

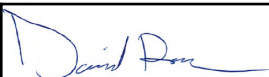
Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

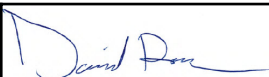
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS23A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS23A-7.0-9.0**DATE/TIME: **1/11/2018 / 08:26**Sample Interval:
7 - 9 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

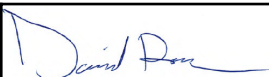
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS25A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS25A-2.5-4.5**DATE/TIME: **1/12/2018 / 11:47**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS25A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS25A-5.0-7.0**DATE/TIME: **1/12/2018 / 11:49**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

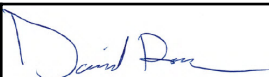
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS27A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS27A-2.5-4.5**DATE/TIME: **1/11/2018 / 09:45**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS27A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS27A-5.0-7.0**DATE/TIME: **1/11/2018 / 09:48**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS29A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS29A-2.5-3.0**DATE/TIME: **1/12/2018 / 10:52**Sample Interval:
2.5 - 3 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

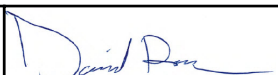
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS29A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS29A-3.5-5**DATE/TIME: **1/12/2018 / 10:54**Sample Interval:
3.5 - 5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

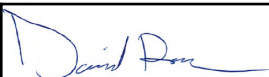
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS29A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS29A-5.5-7.0**DATE/TIME: **1/12/2018 / 10:56**Sample Interval:
5.5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS48**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS48-0.0-0.5**DATE/TIME: **1/14/2018 / 10:20**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

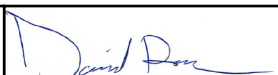
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS49**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS49-0.0-0.5**DATE/TIME: **1/14/2018 / 10:25**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS50**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS50-0.0-0.5**DATE/TIME: **1/14/2018 / 10:30**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

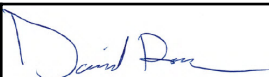
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS51**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS51-0.0-0.5**DATE/TIME: **1/14/2018 / 10:35**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS52**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS52-0.0-0.5**DATE/TIME: **1/13/2018 / 14:05**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

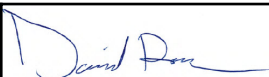
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS53**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS53-0.0-0.5**DATE/TIME: **1/13/2018 / 13:55**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

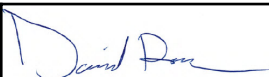
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS54**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS54-0.0-0.5**DATE/TIME: **1/13/2018 / 14:00**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS55**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS55-0.0-0.5**DATE/TIME: **1/13/2018 / 13:50**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS56**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS56-0.0-0.5**DATE/TIME: **1/13/2018 / 11:48**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS57**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS57-0.0-0.5**DATE/TIME: **1/13/2018 / 11:40**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

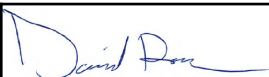
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS58**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS58-0.0-0.5**DATE/TIME: **1/13/2018 / 11:55**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS59**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS59-0.0-0.5**DATE/TIME: **1/13/2018 / 11:38**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

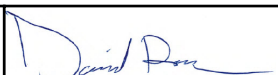
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS60**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS60-0.0-2.0**DATE/TIME: **1/13/2018 / 12:05**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS61**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS61-0.0-2.0**DATE/TIME: **1/13/2018 / 12:15**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS61**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS61-0.0-2.0-FD**DATE/TIME: **1/13/2018 / 12:15**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS62**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS62-0.0-2.0**DATE/TIME: **1/14/2018 / 13:20**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

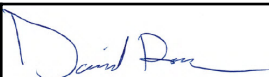
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS63**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS63-0.0-2.0**DATE/TIME: **1/14/2018 / 13:50**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS64**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS64-0.0-2.0**DATE/TIME: **1/14/2018 / 13:30**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS65**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS65-0.0-2.0**DATE/TIME: **1/14/2018 / 14:00**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

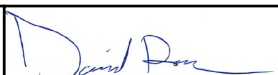
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS66**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS66-0.0-2.0**DATE/TIME: **1/14/2018 / 13:40**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS79**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS79-0.0-0.5**DATE/TIME: **1/15/2018 / 10:05**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	METALS	SW6020A
		DIOXIN	SW8290

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS80**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS80-0.0-0.5**DATE/TIME: **1/15/2018 / 10:00**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	DIOXIN	SW8290
		METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS81**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS81-0.0-0.5**DATE/TIME: **1/15/2018 / 10:10**Sample Interval:
0 - 0.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	DIOXIN	SW8290
		METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS82**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS82-0.0-0.5

DATE/TIME: 1/15/2018 / 09:55

Sample Interval:
0 - 0.5 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	DIOXIN	SW8290
		METALS	SW6020A

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS83**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS83-0.0-2.0**DATE/TIME: **1/11/2018 / 09:20**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

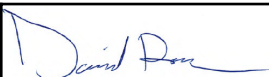
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS83**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS83-2.5-4.5**DATE/TIME: **1/11/2018 / 09:22**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS83**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS83-5.0-7.0**DATE/TIME: **1/11/2018 / 09:24**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

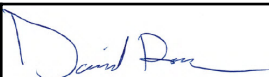
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS84**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS84-0.0-2.0**DATE/TIME: **1/11/2018 / 09:32**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

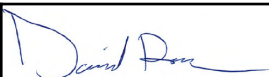
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS84**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS84-2.5-4.5**DATE/TIME: **1/11/2018 / 09:34**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS84**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS84-5.0-7.0**DATE/TIME: **1/11/2018 / 09:36**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS85**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS85-0.0-2.0**DATE/TIME: **1/11/2018 / 09:57**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS85**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS85-2.5-4.5**DATE/TIME: **1/11/2018 / 09:59**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

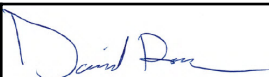
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS85**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS85-5.0-7.0**DATE/TIME: **1/11/2018 / 10:01**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS86**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS86-0.0-2.0**DATE/TIME: **1/11/2018 / 11:13**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS86**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS86-2.5-4.5**DATE/TIME: **1/11/2018 / 11:15**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS86**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS86-5.0-7.0**DATE/TIME: **1/11/2018 / 11:20**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS87**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS87-0.0-2.0**DATE/TIME: **1/11/2018 / 10:50**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

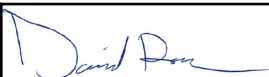
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS87**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS87-2.5-4.5**DATE/TIME: **1/11/2018 / 10:52**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS87**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS87-5.0-7.0**DATE/TIME: **1/11/2018 / 10:54**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS88**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS88-0.0-2.0**DATE/TIME: **1/12/2018 / 11:20**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS88**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS88-10.0-12.0

DATE/TIME: 1/12/2018 / 11:28

Sample Interval:
10 - 12 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

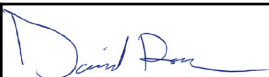
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS88**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS88-2.5-4.5**DATE/TIME: **1/12/2018 / 11:22**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS88**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS88-5.0-7.0**DATE/TIME: **1/12/2018 / 11:24**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

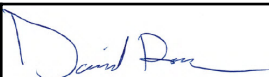
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS88**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS88-7.5-9.5**DATE/TIME: **1/12/2018 / 11:26**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS89**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS89-0.0-2.0**DATE/TIME: **1/12/2018 / 11:35**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS89**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS89-10.0-12.0

DATE/TIME: 1/12/2018 / 11:43

Sample Interval:
10 - 12 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS89**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS89-2.5-4.5**DATE/TIME: **1/12/2018 / 11:37**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

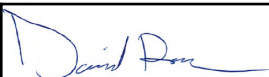
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS89**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS89-5.0-7.0**DATE/TIME: **1/12/2018 / 11:39**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

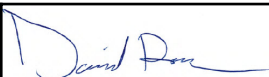
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS89**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS89-7.5-9.5**DATE/TIME: **1/12/2018 / 11:41**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS90**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS90-0.0-2.0**DATE/TIME: **1/12/2018 / 13:00**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS90**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS90-10.0-12.0

DATE/TIME: 1/12/2018 / 13:08

Sample Interval:
10 - 12 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

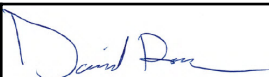
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS90**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS90-2.5-4.5**DATE/TIME: **1/12/2018 / 13:02**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS90**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS90-5.0-7.0**DATE/TIME: **1/12/2018 / 13:04**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS90**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS90-7.5-9.5**DATE/TIME: **1/12/2018 / 13:06**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS91**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS91-0.0-2.0**DATE/TIME: **1/12/2018 / 10:34**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS91**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17SS91-10.0-12.0

DATE/TIME: 1/12/2018 / 10:43

Sample Interval:
10 - 12 Ft

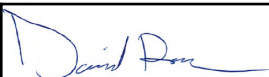
Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

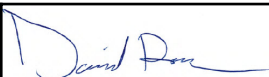
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS91**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS91-2.5-4.5**DATE/TIME: **1/12/2018 / 10:36**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS91**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS91-5.0-7.0**DATE/TIME: **1/12/2018 / 10:37**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

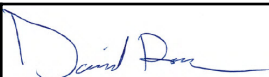
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS91**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS91-7.5-9.5**DATE/TIME: **1/12/2018 / 10:40**Sample Interval:
7.5 - 9.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS92**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS92-0.0-2.0**DATE/TIME: **1/12/2018 / 13:56**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

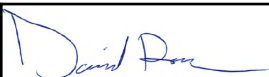
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS92**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS92-2.5-4.5**DATE/TIME: **1/12/2018 / 13:58**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS92**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS92-5.0-7.0**DATE/TIME: **1/12/2018 / 14:00**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS93**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS93-0.0-2.0**DATE/TIME: **1/12/2018 / 13:28**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS93**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS93-2.5-4.5**DATE/TIME: **1/12/2018 / 13:30**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS93**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS93-5.0-7.0**DATE/TIME: **1/12/2018 / 13:32**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS94**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS94-0.0-2.0**DATE/TIME: **1/12/2018 / 14:05**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

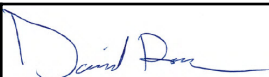
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS94**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS94-2.5-4.5**DATE/TIME: **1/12/2018 / 14:07**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS94**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS94-5.0-7.0**DATE/TIME: **1/12/2018 / 14:09**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS95**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS95-0.0-2.0**DATE/TIME: **1/14/2018 / 11:30**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS96**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS96-0.0-2.0**DATE/TIME: **1/14/2018 / 11:20**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

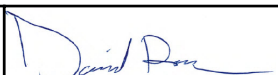
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS97**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS97-0.0-2.0**DATE/TIME: **1/14/2018 / 11:50**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

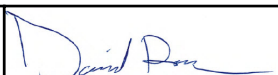
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS98**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS98-0.0-2.0**DATE/TIME: **1/14/2018 / 11:40**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS99**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS99-0.0-2.0**DATE/TIME: **1/12/2018 / 14:15**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS99**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS99-2.5-4.5**DATE/TIME: **1/12/2018 / 14:17**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS99**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS99-5.0-7.0**DATE/TIME: **1/12/2018 / 14:19**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

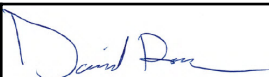
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS100**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS100-0.0-2.0**DATE/TIME: **1/12/2018 / 14:55**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

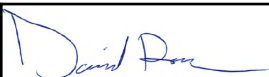
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS100**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS100-2.5-4.5**DATE/TIME: **1/12/2018 / 14:57**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS100**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS100-5.0-7.0**DATE/TIME: **1/12/2018 / 15:00**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

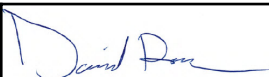
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS101**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS101-0.0-2.0**DATE/TIME: **1/12/2018 / 14:36**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

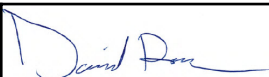
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS101**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS101-2.5-4.5**DATE/TIME: **1/12/2018 / 14:38**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS101**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS101-5.0-7.0**DATE/TIME: **1/12/2018 / 14:40**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

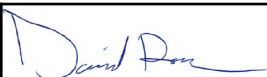
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS102**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS102-0.0-2.0**DATE/TIME: **1/12/2018 / 14:45**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

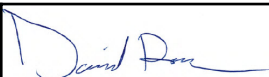
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS102**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS102-2.5-4.5**DATE/TIME: **1/12/2018 / 14:47**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS102**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS102-5.0-7.0**DATE/TIME: **1/12/2018 / 14:49**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS103**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS103-0.0-2.0**DATE/TIME: **1/12/2018 / 15:05**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

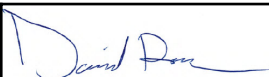
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS103**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS103-2.5-4.5**DATE/TIME: **1/12/2018 / 15:07**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS104**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS104-0.0-2.0**DATE/TIME: **1/13/2018 / 16:00**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

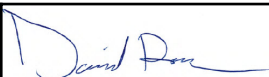
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS104**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS104-2.5-4.5**DATE/TIME: **1/13/2018 / 16:05**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS105**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS105-0.0-2.0**DATE/TIME: **1/12/2018 / 15:21**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

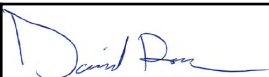
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS105**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS105-2.5-4.5**DATE/TIME: **1/12/2018 / 15:23**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS106**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS106-0.0-2.0**DATE/TIME: **1/14/2018 / 10:50**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

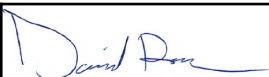
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS107**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS107-0.0-2.0**DATE/TIME: **1/14/2018 / 11:00**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS108**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS108-0.0-2.0**DATE/TIME: **1/13/2018 / 16:15**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS109**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS109-0.0-2.0**DATE/TIME: **1/11/2018 / 11:30**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

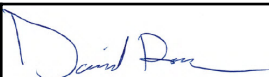
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS109**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS109-2.5-4.5**DATE/TIME: **1/11/2018 / 11:32**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

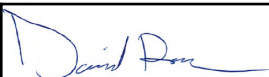
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS109**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS109-5.0-7.0**DATE/TIME: **1/11/2018 / 11:35**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

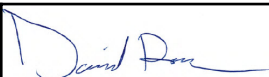
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS110**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS110-0.0-2.0**DATE/TIME: **1/11/2018 / 11:43**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

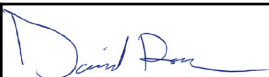
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS110**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS110-2.5-4.5**DATE/TIME: **1/11/2018 / 11:45**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS110**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS110-5.0-7.0**DATE/TIME: **1/11/2018 / 11:47**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS111**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS111-0.0-2.0**DATE/TIME: **1/11/2018 / 13:25**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

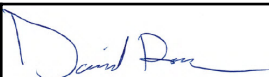
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS111**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS111-2.5-4.5**DATE/TIME: **1/11/2018 / 13:26**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

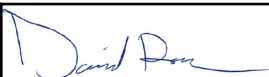
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS111**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS111-5.0-7.0**DATE/TIME: **1/11/2018 / 13:27**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS112**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS112-0.0-2.0**DATE/TIME: **1/11/2018 / 13:35**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

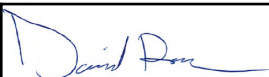
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS112**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS112-2.5-4.5**DATE/TIME: **1/11/2018 / 13:36**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS112**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS112-5.0-7.0**DATE/TIME: **1/11/2018 / 13:37**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS113**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS113-0.0-2.0**DATE/TIME: **1/11/2018 / 13:47**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

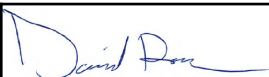
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS113**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS113-2.5-4.5**DATE/TIME: **1/11/2018 / 13:48**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS113**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS113-5.0-7.0**DATE/TIME: **1/11/2018 / 13:49**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

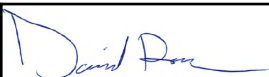
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS114**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS114-0.0-2.0**DATE/TIME: **1/11/2018 / 13:54**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

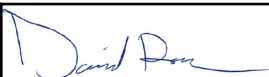
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS114**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS114-2.5-4.5**DATE/TIME: **1/11/2018 / 13:56**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS114**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS114-5.0-7.0**DATE/TIME: **1/11/2018 / 13:58**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

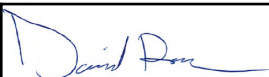
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS115**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS115-0.0-2.0**DATE/TIME: **1/11/2018 / 12:55**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

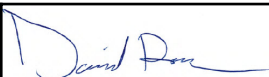
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS115**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS115-2.5-4.5**DATE/TIME: **1/11/2018 / 12:58**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS115**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS115-5.0-7.0**DATE/TIME: **1/11/2018 / 13:00**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

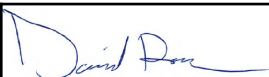
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS116**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS116-0.0-2.0**DATE/TIME: **1/12/2018 / 08:27**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

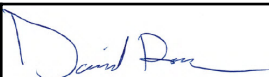
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS116**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS116-2.5-4.5**DATE/TIME: **1/12/2018 / 08:28**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

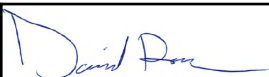
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS116**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS116-5.0-7.0**DATE/TIME: **1/12/2018 / 08:30**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS117**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS117-0.0-2.0**DATE/TIME: **1/12/2018 / 08:39**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

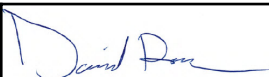
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS117**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS117-2.5-4.5**DATE/TIME: **1/12/2018 / 08:40**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS117**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS117-5.0-7.0**DATE/TIME: **1/12/2018 / 08:42**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS118**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS118-0.0-2.0**DATE/TIME: **1/12/2018 / 08:50**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

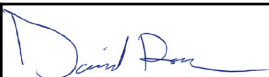
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS118**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS118-2.5-4.5**DATE/TIME: **1/12/2018 / 08:51**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

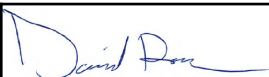
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS118**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS118-5.0-7.0**DATE/TIME: **1/12/2018 / 08:54**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS119**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS119-0.0-2.0**DATE/TIME: **1/12/2018 / 09:02**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

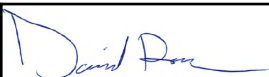
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS119**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS119-2.5-4.5**DATE/TIME: **1/12/2018 / 09:03**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS119**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS119-5.0-7.0**DATE/TIME: **1/12/2018 / 09:05**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS120**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS120-0.0-2.0**DATE/TIME: **1/11/2018 / 13:12**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

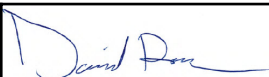
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS120**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS120-2.5-4.5**DATE/TIME: **1/11/2018 / 13:14**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS120**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS120-5.0-7.0**DATE/TIME: **1/11/2018 / 13:16**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

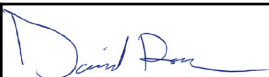
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS121**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS121-0.0-2.0**DATE/TIME: **1/12/2018 / 09:46**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

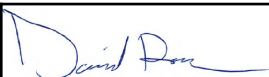
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS121**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS121-2.5-4.5**DATE/TIME: **1/12/2018 / 09:48**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS121**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS121-5.0-7.0**DATE/TIME: **1/12/2018 / 09:50**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS122**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS122-0.0-2.0**DATE/TIME: **1/12/2018 / 09:36**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

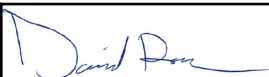
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS122**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS122-2.5-4.5**DATE/TIME: **1/12/2018 / 09:38**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS122**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS122-5.0-7.0**DATE/TIME: **1/12/2018 / 09:40**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS123**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS123-0.0-2.0**DATE/TIME: **1/12/2018 / 09:26**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

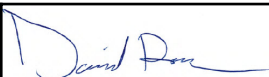
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS123**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS123-2.5-4.5**DATE/TIME: **1/12/2018 / 09:28**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS123**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS123-5.0-7.0**DATE/TIME: **1/12/2018 / 09:30**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

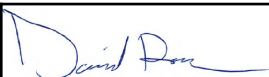
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS124**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS124-0.0-2.0**DATE/TIME: **1/12/2018 / 09:13**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

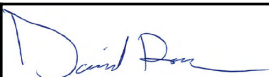
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS124**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS124-2.5-4.5**DATE/TIME: **1/12/2018 / 09:15**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

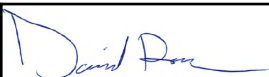
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS124**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS124-5.0-7.0**DATE/TIME: **1/12/2018 / 09:17**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

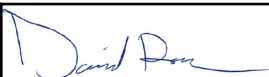
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS125**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS125-0.0-2.0**DATE/TIME: **1/12/2018 / 16:28**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

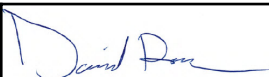
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS125**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS125-2.5-4.5**DATE/TIME: **1/12/2018 / 16:30**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS125**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS125-5.0-7.0**DATE/TIME: **1/12/2018 / 16:32**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS126**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS126-0.0-2.0**DATE/TIME: **1/12/2018 / 16:37**Sample Interval:
0 - 2 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

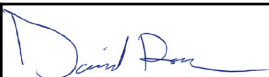
1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS126**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS126-2.5-4.5**DATE/TIME: **1/12/2018 / 16:39**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17SS126**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17SS126-5.0-7.0**DATE/TIME: **1/12/2018 / 16:41**Sample Interval:
5 - 7 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

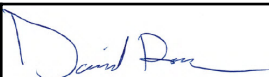
1 of 1

Project Name: **Longhorn AAP**Location ID: **17WW01A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **17WW01A-2.5-4.5**DATE/TIME: **1/11/2018 / 10:32**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17WW01A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17WW01A-5.0-7.0

DATE/TIME: 1/11/2018 / 10:37

Sample Interval:
5 - 7 Ft

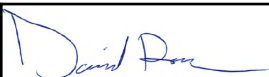
Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **17WW01A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: 17WW01A-8.0-10.0

DATE/TIME: 1/11/2018 / 10:40

Sample Interval:
8 - 10 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011118	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-08A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-08A-0.0-2.0

DATE/TIME: 1/14/2018 / 12:00

Sample Interval:
0 - 2 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-08A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-08A-2.5-4.5

DATE/TIME: 1/14/2018 / 12:05

Sample Interval:
2.5 - 4.5 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011518	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-14A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-14A-0.0-2.0

DATE/TIME: 1/12/2018 / 14:25

Sample Interval:
0 - 2 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

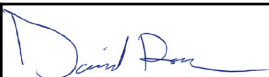
1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-14A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: **COE17-14A-2.5-4.5**DATE/TIME: **1/12/2018 / 14:27**Sample Interval:
2.5 - 4.5 FtSampling Method: **GR**Sample Purpose: **REG**Sample Matrix: **SO**

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-14A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-14A-5.0-7.0

DATE/TIME: 1/12/2018 / 14:30

Sample Interval:
5 - 7 Ft

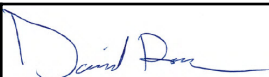
Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan	
QC'ed By:		David Rowan	8/28/2018



Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-15A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-15A-4.0-5.0

DATE/TIME: 1/12/2018 / 15:15

Sample Interval:
4 - 5 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-15A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-15A-5.0-7.0

DATE/TIME: 1/12/2018 / 15:17

Sample Interval:
5 - 7 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-16A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-16A-4.0-5.0

DATE/TIME: 1/12/2018 / 16:20

Sample Interval:
4 - 5 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Sample Collection Log

1 of 1

Project Name: **Longhorn AAP**Location ID: **COE17-16A**Project No: **501032**Sampler(s): **David Rowan**

FIELD CONDITIONS**SAMPLING INFORMATION**Sample No: COE17-16A-5.0-7.0

DATE/TIME: 1/12/2018 / 16:22

Sample Interval:
5 - 7 Ft

Sampling Method: GR

Sample Purpose: REG

Sample Matrix: SO

Sample Notes:

Chain of Custody	COC Notes	Analysis Group	Analytic Method
17-JAN-SO-ALSHT-011218	None	EXPLOSIVES	SW8330

Sampler:		David Rowan
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QC'ed By:		David Rowan	8/28/2018
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Appendix B

Monitoring Well and Piezometer Boring Logs, Construction Diagrams, and Development Records



Well / Boring Log

BORING NO.: _____

MONITORING WELL NO.: 17PZ01

SHEET 1 OF 2

PROJECT NAME Longhorn Army Ammunition Plant	PROJECT NUMBER APTIM Project 501032	ELEVATION AND DATUM Northing: 6952783.40, Easting: 3315662.50		LOCATION LHAAP-17
DRILLING COMPANY Best Drilling	DRILLERS <u>Sonny Tobola</u>	DATE AND TIME STARTED <u>0850 : 12.13.2017</u>		DATE AND TIME COMPLETED <u>1010 : 12.13.2017</u>
DRILLING EQUIPMENT <u>CME 75 Mobile Rig</u>	DRILLING METHOD Hand Auger (0-5 feet) Direct Push () HSA (30')	HOLE DIAMETER ~8"	DP TOTAL DEPTH _____ HSA TOTAL DEPTH _____	TOTAL NO. OF SAMPLES / THICKNESS HA: _____ DP: _____ HSA: 18 / ~2'6"
DRILLING FLUID: NA	DRILLING ANGLE: 90 degrees (vertical)	WATER LEVEL DURING DRILLING: <u>11'</u> FOLLOWING DRILLING: _____ ____ HRS AFTER DRILLING: <u>See Sample Form</u>		LOGGED BY: <u>D. Rowan</u> DATE: <u>12.13.2017</u> CHECKED BY: <u>B. Foss</u> DATE: <u>12.13.2017</u>

LITHOLOGY	DEPTH (FEET)	SAMPLE NO.	RECOVERY (INCHES)	STRENGTH (TCF)	PID READING (PPM)	DESCRIPTION Grading Term, Soil Group Name, Color (Code), Moisture, Consistency, Plasticity, Max Particle Sizes, Angularity, Shape, Other	USCS SYMBOL	ESTIMATED PERCENT OF			COMMENTS
								GRAVEL	SAND	FINES	
						Note: First 48" using post hole digger for utility clearance then probed to 60", boring drilled using ~8" diameter hollow stem augers, logged from split spoon @ 2.5' intervals					Located 10' SE of 17WW02
		1	18			1 to 2'6" - Silty clay w/ tr. sand, dark brown to gray at 2'6", firm, moist, mottled orange Fe staining	ML				2" PVC casing
		2	30			2'6" to 5' - Same as above w/ darker gray color and loss of Fe staining	ML				20' screen from 10 to 30'
		3	30			5' to 7'6" - V. light gray sandy silt w/ clay, moist to v. moist, soft to firm, tr. orange Fe staining	ML				3' stick-up
		4	30			7'6" to 10' - Same as above w/ increased mottling of orange Fe staining from 8' to bottom	ML				
		5	18			10' to 11'6" - V light gray sandy silt, loss of clay and orange Fe staining, soft to firm, wet	ML				Water @ 11', 11' to 22' declared saturated zone
		6	12			11'6" to 12'6" - Same as above only saturated, near fluid supported matrix	ML				
		7	30			12'6" to 15' - V. light gray silty sand, saturated fluid supported matrix, slight twinge of odor, no orange Fe staining	SM				
		8	18			15' to 17'6" - Same as above w/ increased gray color, no longer fluid supported matrix staring at 16' turns into a wet silty sand, tr. orange Fe staining, loss of odor	SM				
		9	30			17'6" to 19' - Same as above	SM				
		10	12			19' to 20' - Sandy silt, v. light gray, mottled orange Fe staining, some lenses of black organics, moist, soft to firm, transition to a silty clay at 20'	ML /CL				
		11	18			20' to 21'6" - V. light gray silty sand, saturated	SM				
		12	6			21'6" to 22' - light gray silt w/ sand, orange Fe staining mottled throughout, moist, soft to firm	ML				
		13	6			22' to 22'6" - Green silty clay w/ tr. sand, moist, mottled orange Fe staining, firm to soft	CL				
		14	30			22'6" to 25' - Silt w/sand, light gray, moist, periodic black organic nodules, firm to soft, high clay concentration from 24'6" to 25', sheeted	ML				22' to 25' considered wet not fully saturated

BORING NO.: _____

MONITORING WELL NO.: 17PZ01

PROJECT NAME Longhorn Army Ammunition Plant	PROJECT NUMBER APTIM Project 501032	ELEVATION AND DATUM Northing: 6952783.40, Easting: 3315662.50		LOCATION LHAAP-17
DRILLING COMPANY Best Drilling	DRILLERS <u>Sonny Tobola</u>	DATE AND TIME STARTED <u>0850 : 12.13.2017</u>		DATE AND TIME COMPLETED <u>1010 : 12.13.2017</u>
DRILLING EQUIPMENT <u>CME 75 Mobile Rig</u> _____ _____	DRILLING METHOD Hand Auger (0-5 feet) Direct Push (_____) HSA (30')	HOLE DIAMETER <u>~8"</u> _____ _____	DP TOTAL DEPTH _____ HSA TOTAL DEPTH_____	TOTAL NO. OF SAMPLES / THICKNESS HA: _____ DP: _____ HSA: <u>18 / ~2'6"</u>
DRILLING FLUID: NA	DRILLING ANGLE: 90 degrees (vertical)	WATER LEVEL DURING DRILLING: <u>11'</u> FOLLOWING DRILLING: _____ ____ HRS AFTER DRILLING: <u>See Sample Form</u>		LOGGED BY: _____ DATE: <u>12.13.2017</u> CHECKED BY: _____ DATE: <u>12.13.2017</u> B. Foss

[illegible]



MONITORING WELL CONSTRUCTION

Project: **Longhorn Army Ammunition Plant**

Location: **Karnack, Texas**

Client: **US Army Corps of Engineers**

Subcontractor: **Best Drilling**

Driller: **Sonny Tobola**

Field Representative: **B. Foss D. Rowan**

Well Number: **17PZ01**

Site Location: **LHAAP-17**

Installation Date: **12.13.2017**

Northing: **6952783.40**

Easting: **3315662.50**

Protective Cover Elevation (ft): **NM**

Top of Casing Elv. (ft): **177.22**

Top of Casing Stickup (ft): **3.08**

Land Surface Elv. (ft): **174.14**

Approximate Diameter of Borehole (in): **8**

Well Casing Diameter (in): **2**

Depth to Water (ft): **NM**

During Drilling: **11**

Date: **12.13.2017**

Post Development: **NM**

Date: **NM**

Top of Bentonite Seal (ft): **6**

Top of Filter Pack (ft): **8**

Top of Screen Interval (ft): **10**

Bottom of Screen Interval (ft): **30**

Bottom of Well (ft): **30**

Bottom of Filter Pack (ft): **30**

Bottom of Borehole (ft): **30**

Protective Casing:

Type: **Steel Stickup**

Dimensions (in): **4**

Length (ft): **5**

Guard Post: **4 bollards**

Ground Seal (Surface Pad)

Dimensions: **4' x 4'**

Type: **Concrete**

Annular Space Seal

Type: **Bentonite/Portland Cement Grout**

Installation: **Gravity Tremie Pumped**

Bentonite Seal:

Type: **Pellets Slurry**

Installation: **6-in Lifts One Section**

Gravity Tremie Pumped

Hydration Time (hrs): **2 hours**

Filter Pack Material:

Product Name: **Silica Sand**

Size: **20/40**

Volume Added (ft³):

Installation: **14.5 x 50# bags**

Gravity Tremie

Well Casing:

Type: **PVC**

Diameter (in): **2**

Well Screen Casing:

Type: **PVC**

Slot Size (in): **0.010 %Open**

Continuous-Wrap Factory Slot

Sump/End Cap:

Cap



Well / Boring Log

BORING NO.: _____
 MONITORING WELL NO.: 17PZ02

SHEET 1 OF 1

PROJECT NAME Longhorn Army Ammunition Plant	PROJECT NUMBER APTIM Project 501032	ELEVATION AND DATUM Northing: 6952764.55, Easting: 3315647.64		LOCATION LHAAP-17
DRILLING COMPANY Best Drilling	DRILLERS Sonny Tobola	DATE AND TIME STARTED 1200 : 12.13.2017		DATE AND TIME COMPLETED 1250 : 12.13.2017
DRILLING EQUIPMENT CME 75 Mobile Rig	DRILLING METHOD Hand Auger (0-5 feet) Direct Push () HSA (30')	HOLE DIAMETER 10.25	DP TOTAL DEPTH _____ HSA TOTAL DEPTH _____	TOTAL NO. OF SAMPLES / THICKNESS HA: _____ DP: _____ HSA: 6 / 5'
DRILLING FLUID: NA	DRILLING ANGLE: 90 degrees (vertical)	WATER LEVEL DURING DRILLING: 12' FOLLOWING DRILLING: _____ HRS AFTER DRILLING: See Sample Form		LOGGED BY: D. Rowan DATE: 12.13.2017 CHECKED BY: B. Foss DATE: 12.13.2017

LITHOLOGY	DEPTH (FEET)	SAMPLE NO.	RECOVERY (INCHES)	STRENGTH (TCF)	PID READING (PPM)	DESCRIPTION Grading Term, Soil Group Name, Color (Code), Moisture, Consistency, Plasticity, Max Particle Sizes, Angularity, Shape, Other	USCS SYMBOL	ESTIMATED PERCENT OF			COMMENTS
								GRAVEL	SAND	FINES	
						Note: First 48" using post hole digger for utility clearance then probed to 60", boring drilled using ~10.25" diameter hollow stem augers, logged from split spoon @ 5' intervals					2" PVC casing
		1	36	3.5		2' to 5' - Gray, moist, firm, silty clay w/orange Fe staining mottled throughout, plastic	CL				20' screen from
		2	60	5.5		5' to 8' - same as above	CL				10' to 30'
						8' to 10' - Dark gray silt, high concentration of orange Fe staining, damp to slightly moist, low to no plasticity even when wet	ML				TD 30'
		3	60	8.5		10' to 12' - Light gray sandy silt, wet, firm to soft, high concentration of orange Fe staining	ML				
						12' to 13'6" - Saturated, silty sand, light gray, no orange Fe staining	SM				
						13'6" to 15' - Light gray sandy silt, wet, firm to soft, high concentration of orange Fe staining	ML				
		4	60	4.5		15' to 17' - No recovery due to fluid supported sand matrix	SM				
						17' to 19' - Saturated silty sand w/ some orange Fe staining	SM				
						19' to 20' - Sandy silt, light gray, high concentration of orange Fe staining, firm to soft	ML				
		5	60	4.5		20' to 21' - same as above	ML				
						21' to 24' - Sandy silt, sheeted, light gray, moist, firm to soft, brittle, no plasticity	ML				
						24' to 25' - Black silt w/ some clay, sheeted, damp, no orange Fe staining	OL				
		6	60	7.5		25' to 30' - Same as above	OL				
						30' - End boring					



MONITORING WELL CONSTRUCTION

Project: **Longhorn Army Ammunition Plant**

Location: **Karnack, Texas**

Client: **US Army Corps of Engineers**

Subcontractor: **Best Drilling**

Driller: **Sonny Tobola**

Field Representative: **B. Foss D. Rowan**

Well Number: **17PZ02**

Site Location: **LHAAP-17**

Installation Date: **12.13.2017**

Northing: **6952764.55**

Easting: **3315647.64**

Protective Cover Elevation (ft): **NM**

Top of Casing Elv. (ft): **177.75**

Top of Casing Stickup (ft): **3.18**

Land Surface Elv. (ft): **174.57**

Approximate Diameter of Borehole (in): **10 3/4**

Well Casing Diameter (in): **2**

Depth to Water (ft): **NM**

During Drilling: **12**

Date: **12.13.2017**

Post Development: **NM**

Date: **NM**

Top of Bentonite Seal (ft): **6**

Top of Filter Pack (ft): **8**

Top of Screen Interval (ft): **10**

Bottom of Screen Interval (ft): **30**

Bottom of Well (ft): **30**

Bottom of Filter Pack (ft): **30**

Bottom of Borehole (ft): **30**

Protective Casing:

Type: **Steel Stickup**

Dimensions (in): **4**

Length (ft): **5**

Guard Post: **4 bollards**

Ground Seal (Surface Pad)

Dimensions: **4' x 4'**

Type: **Concrete**

Annular Space Seal

Type: **Bentonite/Portland Cement Grout**

Installation: **Gravity Tremie Pumped**

Bentonite Seal:

Type: **Pellets Slurry**

Installation: **6-in Lifts One Section**

Gravity Tremie Pumped

Hydration Time (hrs): **2 hours**

Filter Pack Material:

Product Name: **Silica Sand**

Size: **20/40**

Volume Added (ft³):

Installation: **18 x 50# bags**

Gravity Tremie

Well Casing:

Type: **PVC**

Diameter (in): **2**

Well Screen Casing:

Type: **PVC**

Slot Size (in): **0.010 %Open**

Continuous-Wrap Factory Slot

Sump/End Cap:

Cap



Well / Boring Log

BORING NO.: _____

MONITORING WELL NO.: 17PZ03

SHEET 1 OF 1

PROJECT NAME Longhorn Army Ammunition Plant	PROJECT NUMBER APTIM Project 501032	ELEVATION AND DATUM Northing: 6952773.35, Easting 3315739.59		LOCATION LHAAP-17
DRILLING COMPANY Best Drilling	DRILLERS <u>Sonny Tobola</u>	DATE AND TIME STARTED <u>1440 : 12.13.2017</u>		DATE AND TIME COMPLETED <u>1530 : 12.13.2017</u>
DRILLING EQUIPMENT <u>CME 75 Mobile Rig</u>	DRILLING METHOD Hand Auger (0-5 feet) Direct Push () HSA (30')	HOLE DIAMETER <u>10.25</u>	DP TOTAL DEPTH _____ HSA TOTAL DEPTH _____	TOTAL NO. OF SAMPLES / THICKNESS HA: _____ DP: _____ HSA: <u>6 / 5'</u>
DRILLING FLUID: NA	DRILLING ANGLE: 90 degrees (vertical)	WATER LEVEL DURING DRILLING: <u>12'6"</u> FOLLOWING DRILLING: _____ ____ HRS AFTER DRILLING: <u>See Sample Form</u>		LOGGED BY: _____ DATE: <u>12.13.2017</u> CHECKED BY: _____ DATE: <u>12.13.2017</u>

LITHOLOGY	DEPTH (FEET)	SAMPLE NO.	RECOVERY (INCHES)	STRENGTH (TCF)	PID READING (PPM)	DESCRIPTION Grading Term, Soil Group Name, Color (Code), Moisture, Consistency, Plasticity, Max Particle Sizes, Angularity, Shape, Other	USCS SYMBOL	ESTIMATED PERCENT OF			COMMENTS
								GRAVEL	SAND	FINES	
						Note: First 48" using post hole digger for utility clearance then probed to 60", boring drilled using ~10.25" diameter hollow stem augers, logged from split spoon @ 5' intervals					2" PVC casing
		1	30	4.6		2'6" to 5' - Black and red topsoil to 4' transition to gray silty clay, damp to dry	Pt/CL				15' screen from 9' to 24'
		2	60	5.7		5' to 9' - Light gray, mottled silty clay, moist, firm to soft, orange Fe staining	CL				
						9' to 10' - same as above only silt w/sand, v. fine grained	ML				
		3	60	6.3		10' to 12'6" - Wet, light gray silt, mottled, orange Fe staining	ML				
						12'6" to 14" Saturated silty sand, mottled, light gray, orange Fe staining	SM				Water at 12'6" to 18'
						14' to 15' - Light gray, silty sand, non-mottled, little to no orange Fe staining	SM				
		4	60	6.0		15' to 18' - Same as above in a fluid supported matrix	SM				
						18' to 20' - Light gray, mottled, orange Fe staining, silty clay w/ sand, wet, firm to soft	CL				
		5	60	5.3		20' to 25' - Light gray, clayey silt w/ sand, mottled, firm, wet to moist, orange Fe staining	ML				
		6	60	4.7		25' to 26' - Light gray silt, v. moist to wet	ML				Well set at 24' w/15' screen due to substrate becoming unsaturated from approximately 22' to 25' 6" and then increasingly wet and saturated.
						26' to 27'6" - Light gray, sandy silt, firm, wet	ML				
						27'6" to 30' Silty sand nearly saturated, light gray	SM				
						30' - End boring					Bentonite plug from 24' to 30' to prevent cross contamination of deeper saturated zone.



MONITORING WELL CONSTRUCTION

Project: **Longhorn Army Ammunition Plant**

Location: **Karnack, Texas**

Client: **US Army Corps of Engineers**

Subcontractor: **Best Drilling**

Driller: **Sonny Tobola**

Field Representative: **B. Foss D. Rowan**

Well Number: **17PZ03**

Site Location: **LHAAP-17**

Installation Date: **12.13.2017**

Northing: **6952773.35**

Easting: **3315739.59**

Protective Cover Elevation (ft): **NM**

Top of Casing Elv. (ft): **177.76**

Top of Casing Stickup (ft): **3.07**

Land Surface Elv. (ft): **174.69**

Approximate Diameter of Borehole (in): **10 1/4**

Well Casing Diameter (in): **2**

Depth to Water (ft):

During Drilling: **12.5**

Date: **12.13.2017**

Post Development: **NM**

Date: **NM**

Top of Bentonite Seal (ft): **4**

Top of Filter Pack (ft): **6**

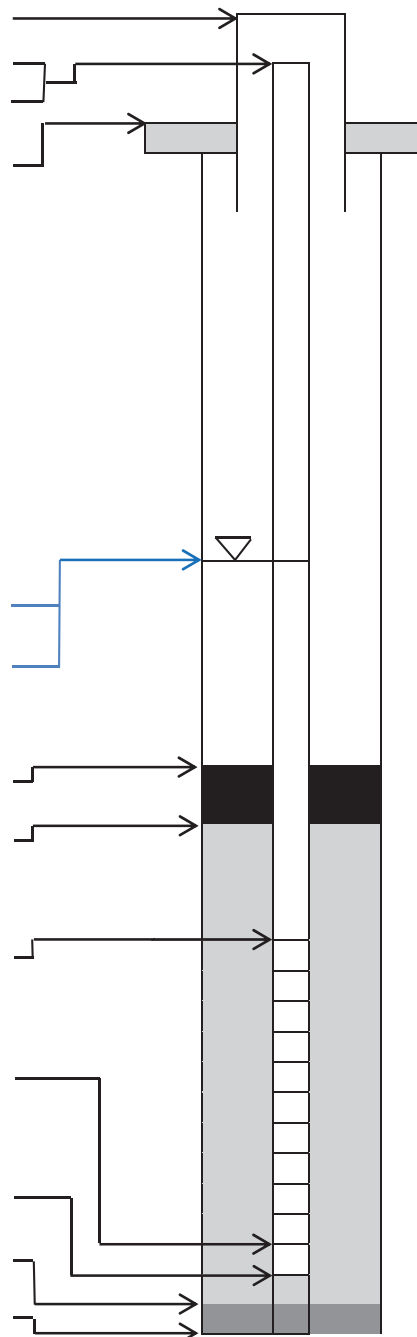
Top of Screen Interval (ft): **9**

Bottom of Screen Interval (ft): **24**

Bottom of Well (ft): **24**

Bottom of Filter Pack (ft): **24**

Bottom of Borehole (ft): **30**



Protective Casing:

Type: **Steel Stickup**

Dimensions (in): **4**

Length (ft): **5**

Guard Post: **4 bollards**

Ground Seal (Surface Pad)

Dimensions: **4' x 4'**

Type: **Concrete**

Annular Space Seal

Type: **Bentonite/Portland Cement Grout**

Installation: **Gravity Tremie Pumped**

Bentonite Seal:

Type: **Pellets Slurry**

Installation: **6-in Lifts One Section**

Hydration Time (hrs): **2 hours**

Filter Pack Material:

Product Name: **Silica Sand**

Size: **20/40**

Volume Added (ft³): **18 x 50# bags**

Installation: **Gravity Tremie**

Well Casing:

Type: **PVC**

Diameter (in): **2**

Well Screen Casing:

Type: **PVC**

Slot Size (in): **0.010**

Continuous Wrap: **%Open Factory Slot**

Sump/End Cap:

Cap



Well / Boring Log

BORING NO.: _____

MONITORING WELL NO.: 17WW19

SHEET 1 OF 1

PROJECT NAME Longhorn Army Ammunition Plant	PROJECT NUMBER APTIM Project 501032	ELEVATION AND DATUM Northing: 6952718.36 Easting: 3315313.67		LOCATION LHAAP-17
DRILLING COMPANY Best Drilling	DRILLERS Sonny Tobola	DATE AND TIME STARTED 0730 : 12.15.2017		DATE AND TIME COMPLETED 0830 : 12.15.2017
DRILLING EQUIPMENT CME 75 Mobile Rig	DRILLING METHOD Hand Auger (0-5 feet) Direct Push () HSA (25)	HOLE DIAMETER 10.25	DP TOTAL DEPTH _____ HSA TOTAL DEPTH _____	TOTAL NO. OF SAMPLES / THICKNESS HA: _____ DP: _____ HSA: 5 / 5'
DRILLING FLUID: NA	DRILLING ANGLE: 90 degrees (vertical)	WATER LEVEL DURING DRILLING: 11'6" FOLLOWING DRILLING: _____ HRS AFTER DRILLING: See Sample Form		LOGGED BY: D. Rowan DATE: 12.15.2017 CHECKED BY: W. Foss DATE: 12.15.2017

LITHOLOGY	DEPTH (FEET)	SAMPLE NO.	1 RECOVERY (INCHES)	STRENGTH (TCF)	PID READING (PPM)	DESCRIPTION Grading Term, Soil Group Name, Color (Code), Moisture, Consistency, Plasticity, Max Particle Sizes, Angularity, Shape, Other	USCS SYMBOL	ESTIMATED PERCENT OF			COMMENTS
								GRAVEL	SAND	FINES	
	5	1	36		2.5	Note: First 4" using post hole digger for utility clearance then probed to 60", boring drilled using ~10.25" diameter hollow stem augers, logged from split spoon @ 5' intervals. 2' to 4' - Dry to damp, light gray clayey silt, mottled w/ orange Fe staining and black organic nodules, no plasticity even when wet, firm to brittle 4' to 5' - Moist gray clayey silt, w/ int. sand, mottled orange Fe staining, black organics, slightly plastic, firm to soft 5' to 6'6" - Same as above 6'6" - 10' - Gray and tan sandy silt, moist, stiff to soft, mottled orange Fe staining, black organic lenses, no plasticity 10' to 11'6" - Moist orange sandy silt, mottled orange Fe staining, black organics, slightly plastic, firm to soft 11'6" to 13'6" - Saturated silty sand, light gray, orange Fe staining, loss of black organics 13'6" to 15' - No recovery super saturated fluid supported matrix lost in bore hole 15' to 18'6" - Same as above 18'6" to 19'6" - Wet, black and gray silty clay, firm to soft, plastic, mottled orange Fe staining w/ int. black organic nodules 19'6" to 20' - Light gray to black clayey silt, moist, firm, slight plasticity, mottled orange Fe staining 20' to 25' - Dark gray silty clay to clayey silt, moist to damp, firm, no plasticity, loss of Fe staining and organics at 23'6" to bottom, sheeted 25' - End of boring	ML ML ML MH MH SM SM SM CL ML CL				4" PVC casing 15' screen from 10' to 25' water at 11'6" to 18'6"/19'



MONITORING WELL CONSTRUCTION

Project: **Longhorn Army Ammunition Plant**

Location: **Karnack, Texas**

Client: **US Army Corp of Engineers**

Subcontractor: **Best Drilling**

Driller: **Sonny Tobola**

Field Representative: **D. Rowan**

Well Number: **17WW19**

Site Location: **LHAAP-17**

Installation Date: **12.15.2017**

Northing: **6952718.36**

Easting: **3315313.67**

Protective Cover Elevation (ft): **NM**

Top of Casing Elv. (ft): **180.08**

Top of Casing Stickup (ft): **3.45**

Land Surface Elv. (ft): **176.63**

Approximate Diameter of Borehole (in): **10 3/4**

Well Casing Diameter (in): **4**

Depth to Water (ft):

During Drilling: **11.5**

Date: **12.15.2017**

Post Development: **NM**

Date: **NM**

Top of Bentonite Seal (ft): **6**

Top of Filter Pack (ft): **8**

Top of Screen Interval (ft): **10**

Bottom of Screen Interval (ft): **25**

Bottom of Well (ft): **25**

Bottom of Filter Pack (ft): **25**

Bottom of Borehole (ft): **25**

Protective Casing:

Type: **Steel Stickup**

Dimensions (in): **4**

Length (ft): **5**

Guard Post: **4 bollards**

Ground Seal (Surface Pad)

Dimensions: **4' x 4'**

Type: **Concrete**

Annular Space Seal

Type: **Bentonite/Portland Cement Grout**

Installation: **Gravity Tremie Pumped**

Bentonite Seal:

Type: **Pellets Slurry**

Installation: **6-in Lifts One Section**

Gravity Tremie Pumped

Hydration Time (hrs): **2 hours**

Filter Pack Material:

Product Name: **Silica Sand**

Size: **20/40**

Volume Added (ft³):

Installation: **18 x 50# bags**

Gravity Tremie

Well Casing:

Type: **PVC**

Diameter (in): **4**

Well Screen Casing:

Type: **PVC**

Slot Size (in): **0.010**

Continuous-Wrap Factory Slot

Sump/End Cap:

Cap

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: <u>LHAAP-17</u>	LocID: <u>17P201</u>	Date: <u>12-15-17</u>								
	Project Name: Longhorn Army Ammunition Plant	Project #: <u>501032</u>	Recorded By: <u>D. Runn</u> Checked By: _____								
EQUIPMENT	Water Quality Meter Type/ID #: <u>YSI 6420 v2 40115</u>	Water Level Indicator Type/ID #: <u>Intake Probe</u>									
	Equipment Group: _____	Equipment Group: _____									
	Development Equipment: <u>White Pump</u>	Equipment Decon.: <u>7</u>									
WELL INFO	Casing I.D. (in) [a]: <u>2"</u>	Unit Casing Volume (gal/in ft) [b]: <u>0.16</u>	Initial Depth to Water (ft) [c]: <u>9.8</u>								
	Total Well Depth (ft) [d]: <u>33.25</u>	Water Column Thickness (ft) [d-c]: <u>23.45</u>	Well Volume (gal) [(d-c) x b]: <u>3.752</u>								
	Ground Condition of Well: _____		Remarks: _____								
CASING INFO	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
	Unit Casing Volume (gal/in ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation (cpm)	Remarks (odor, clarity, etc.)
12/15/17	1525	Pump	13.35	0	0.65	18.55	7.25	1.076	1.33	1600		63.4	Cloudy
	1535		13.35			19.86	6.97	2.575	1.60	800		61.7	Cloudy
	1540		14			19.96	6.86	2.445	1.50	600		37	Mixy
	1550		13.5			19.98	6	2	1.45	200		42	not quite clear but
	1600		13.25			20.02	6	2	1.40	150		39	not cloudy
	1610		13.0			20.00	6	2	1.45	95		40	

Development Criteria:

- 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND
4) remove water added during drilling and construction

33.2
10.6

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: <u>L4A7P-17</u>	LocID: <u>17P202</u>	Date: <u>12.15.17</u>								
	Project Name: Longhorn Army Ammunition Plant	Project #:	Recorded By: <u>DR</u> Checked By:								
EQUIPMENT	Water Quality Meter Type/ID #: <u>YSZ 6920V2 #0115</u>	Water Level Indicator Type/ID #: <u>Interface Probe</u>									
	Equipment Group:	Equipment Group:									
	Development Equipment: <u>Whale Pump</u>	Equipment Decon.: <u>7</u>									
WELL INFO	Casing I.D. (in) [a]: <u>2"</u>	Unit Casing Volume (gal/in ft) [b]: <u>0.16</u>	Initial Depth to Water (ft) [c]: <u>10.6</u>								
	Total Well Depth (ft) [d]: <u>33.2</u>	Water Column Thickness (ft) [d-c]: <u>23</u>	Well Volume (gal) [(d-c) x b]: <u>3.68</u>								
	Ground Condition of Well:		Remarks:								
CASING INFO	Casing I.D. (in) [a]:	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
	Unit Casing Volume (gal/in ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation ()	Remarks (odor, clarity, etc.)
12/15/17	11:20	Pump	10			19.20	6.90	2.352	1.89	1800		-31	
	11:30		11.5			19.22	7.82	2.488	3.36	1200			
	11:40		13.2			19.29	6.94	2.498	4.08	800			
	11:45		15.0			19.24	6.92	2.998	4.10	200			
	11:50		15.2			19.30	6.90	2.995	4.12	100			

Development Criteria:

- 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND
- 4) remove water added during drilling and construction

MONITORING WELL DEVELOPMENT FORM

LOCATION	Site: <u>LHAAP-17</u>	LocID: <u>17P203</u>	Date: <u>12.15.17</u>								
	Project Name: Longhorn Army Ammunition Plant	Project #:	Recorded By: _____ Checked By: _____								
EQUIPMENT	Water Quality Meter Type/ID #:	Water Level Indicator Type/ID #:									
	Equipment Group:	Equipment Group:									
	Development Equipment:	Equipment Decon.:									
WELL INFO	Casing I.D. (in) [a]: <u>2"</u>	Unit Casing Volume (gal/in ft) [b]: <u>0.16</u>	Initial Depth to Water (ft) [c]: <u>10.10</u>								
	Total Well Depth (ft) [d]: <u>27.8</u>	Water Column Thickness (ft) [d-c]: <u>17.7</u>	Well Volume (gal) [(d-c) x b]: <u>2.83</u>								
	Ground Condition of Well:		Remarks:								
CASING INFO	Casing I.D. (in) [a]:	1.5	<u>2.0</u>	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
	Unit Casing Volume (gal/in ft) [b]:	0.09	0.16	0.20	0.37	0.65	0.75	1.0	1.5	2.0	2.6

Date	Time (24 hr)	Method (pump, surge, bail)	Water Level (FTOC)	Volume Removed (gal)	Pumping Rate (gpm)	Temp. (C)	pH	Conductivity (mS/cm)	DO (mg/L)	Turb. (NTU)	Sed. (mL/L)	Radiation (KRP)	Remarks (odor, clarity, etc.)
12.15.17	1420	Pump	10.10	0	0.65	20.57	7.43	2.811	1.97	1647		107.8	Cloudy tan
	1430		24.0	6.8		20.42	7.27	3.260	4.95	1592		64.8	Fast draw down with annular remove
	1440		27.0	13.0		20.20	7.28	3.134	3.58	1800		71.0	Pumped out as fast as coming in
	1450		27.25	20		20.10	7.00	3.168	4.02	1100		80	
	1500		25.0	26.5		20.10	6.96	3.046	4.25	800		79.5	
	1510		25.0	29.7	0.32	20.16	6.92	3.182	4.03	700		75.2	
	1515		26.8	32.9		20.12	6.95	3.095	4.02	500		62.5	
	1520		28.2	36.1		20.15	6.94	3.098	4.00	520		62.5	

Development Criteria:

- 1) sediment <0.75 mL/L, 2) turbidity within 10 NTU range for 30 minutes, 3) +/- 0.5 C, +/- 0.1 pH, +/- 3 % conductivity, +/- 10% DO for 3 consecutive readings, AND
4) remove water added during drilling and construction

Well Development Record

Project Name: LHAM? Project No. 50632 Date 1/13/18

Well/Piezometer I.D. 17mm Original Development Redevelopment ☒

Location: LHAP-17 Date Installed: _____ Csg. Diameter: 4

Date (Start/End): 1/13/18 Personnel: D. Brown

Initial DTW (BTOC): 12.55 Final DTW (BTOC): 20.0

Initial Total Depth (BTOC'): 27.95 Final Total Depth (BTOC'): 27.95

Method of Development

Swabbing	☒ Bailing	☒ Pumping	Other (State Method)
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Equipment Decontaminated Prior to Development	Yes	No
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Describe Decon Method

Equipment used for measuring water quality parameters:

X YSI Water Surveyor 6820 (Multi-Parameter) Unit# 115 Calibrated? 7

Casing Volume Information:

Casing ID "	1	2	4	6	8
Unit Casing Volume (A) (gal/ft)	.004	0.16	0.65	1.5	2.6

$$TD' 27.16 - DTW' 12.55 = WC' 15.4 \times (A) 0.65 = 1WV 10.1 \times 5 = 50.05 \text{ gals to be purged}$$
[illegible]

WELL CONSTRUCTION DIAGRAM (Above ground)

SITE:	LONGHORN ARMY AMMUNITION PLAN - SITE 17	WELL/BORING ID:	17WW20
PROJECT NAME:	INVESTIGATION AT SITE 17	DRILLING METHOD:	HOLLOW STEM AUGER
PROJECT NO.:	501032	DATE(S):	4/26/18
DRILLING CONTRACTOR:	BEST DRILLING	SURVEYOR:	TBD
DRILLER:	SONNY TOBOLA	NORTHING:	TBD
SCIENTIST:	ALLEN WILLMORE	EASTING:	TBD

PROTECTIVE CASING

Type: STEEL CASING WITH HINGED LOCKING CAP

Dimensions: 8" X 8" SQUARED

Length: 5 FT LONG (BOTTOM ~2 FT BELOW GROUND)

Ground Surface Elevation (NAVD 88): TBD

Well Lid Type: LOCKING CAP

Casing Elevation (NAVD 88): TBD

Borehole Diameter (in): 10 INCHES

Well Casing Diameter (in): 4 INCHES

WELL CASING (RISER)

Manufacturer: GULF COAST

Type/Material: SCHEDULE 40 PVC

Diameter (in): 4

Connection: THREADED

WELL SCREEN

Manufacturer: GULF COAST

Type/Material: SCHEDULE 40 PVC

Slot Size (in): 4 INCH DIAMETER

Slot Type: 0.01

Connection: THREADED

ANNULAR SEAL

Type: PORTLAND CEMENT TYPE I/II

Manufacturer: TXI

Mud Scale: 7 GALLONS OF WATER PER 94 LB BAG

Installation: PUMP VIA TREMIE PIPE

BENTONITE SEAL

Manufacturer: WYO-BEN

Product Name: ENVIROPLUG

Size: MEDIUM

Installation: GRAVITY-FED

PRIMARY FILTER PACK

Manufacturer: PIONEER

Product Name: SILICA SAND

Size: 20/40

Installation: GRAVITY-FED

END CAP

Type: SCHEDULE 40 PVC

Length: 6 INCH CONE

BACKFILL MATERIAL

Type: 20/40 SILICA SAND

NOT TO SCALE

Bollards: 4 STEEL BOLLARDS CONCRETED INTO GROUND SURFACE (~4 FT ABOVE GROUND)

Existing Surface

SURFACE PAD

Dimensions: 3 FT X 3 FT X 6 IN (THICK)

Type: CONCRETE

Top of Bentonite Seal: 14 FT BGS

Top of Filter Pack: 16 FT BGS

Top of Screen: 18 FT BGS

DEPTH TO WATER

During Drilling: ~19.2 FT BGS

Date: 4/26/18

Post Development: NOT RECORDED

Date: NOT RECORDED

Bottom of Screen: 28 FT BGS

Bottom of Well: 28.5 FT BGS

Borehole Depth: 30

Comments: One foot of bentonite was introduced then allowed to hydrate for 30 minutes, then a second foot of bentonite was introduced and allowed to hydrate 30 minutes prior to introducing grout. Rose Zeiler (BRAC) was consulted by Praveen Srivastav (APTIM) for final well depth. Clay was not found at bottom of boring.

LONGHORN ARMY AMMUNITION PLANT (LHAAP) - KARNACK, TEXAS

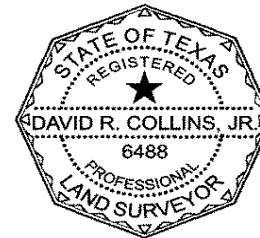
PREPARED FOR APTIM Federal Services, LLC.

2500 CityWest Blvd, Suite 1700

Houston, Texas 77042

TEXAS STATE PLANE COORDINATE SYSTEM NORTH CENTRAL ZONE (4202), 1983 NORTH AMERICAN DATUM

MONITORING WELL	NORTHING	EASTING	NAVD 88 ELEVATION	
	TOP OF CASING	TOP OF CASING	TOP OF CASING	GROUND
04WW06	6959225.38	3305871.99	215.63	212.52
04WW07	6959038.63	3306006.11	214.64	211.66
04WW08	6959148.15	3305963.41	214.82	212.07
17WW19	6952718.36	3315313.67	180.08	176.63
17PZ01	6952783.40	3315662.50	177.22	174.14
17PZ02	6952764.55	3315647.64	177.75	174.57
17PZ03	6952773.35	3315739.59	177.76	174.69



DAVID R. COLLINS, JR.

R.P.L.S.#6488

SURVEY DATE: FEBRUARY 14, 2018

Appendix C

Soil and Groundwater Analytical Data Reports

(Provided on compact disc)



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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December 04, 2017

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS17110803**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 7 sample(s) on Nov 15, 2017 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: Jumokey.Lawal
Sonia West
Project Manager

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS17110803

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS17110803-01	17TB01-111417	Water	ALS 102817-14	14-Nov-2017 09:10	15-Nov-2017 08:40	☐
HS17110803-02	C-07-111417	Groundwater		14-Nov-2017 10:10	15-Nov-2017 08:40	☐
HS17110803-03	17WW08-111417	Groundwater		14-Nov-2017 11:00	15-Nov-2017 08:40	☐
HS17110803-04	17WW07-111417	Groundwater		14-Nov-2017 11:55	15-Nov-2017 08:40	☐
HS17110803-05	17WW13-111417	Groundwater		14-Nov-2017 12:35	15-Nov-2017 08:40	☐
HS17110803-06	130-111417	Groundwater		14-Nov-2017 13:25	15-Nov-2017 08:40	☐
HS17110803-07	17WW03-111417	Groundwater		14-Nov-2017 14:20	15-Nov-2017 08:40	☐

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.**CASE NARRATIVE****Project:** Longhorn Army Ammunition Plant**Work Order:** HS17110803

Work Order Comments

- The analyses for Perchlorate were subcontracted to ALS Environmental in Salt Lake City, UT.

GCMS Volatiles by Method SW8260**Batch ID: R305690****Sample ID: HS17110677-07MS**

- MS and MSD are for an unrelated sample
-

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB01-111417
 Collection Date: 14-Nov-2017 09:10

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 18:21
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 18:21
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 18:21
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 18:21
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 18:21
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB01-111417
 Collection Date: 14-Nov-2017 09:10

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 18:21
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 18:21
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 18:21
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 18:21
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 18:21
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.9</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>17-Nov-2017 18:21</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>103</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>17-Nov-2017 18:21</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.4</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>17-Nov-2017 18:21</i>
<i>Surr: Toluene-d8</i>	<i>94.3</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>17-Nov-2017 18:21</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: C-07-111417
 Collection Date: 14-Nov-2017 10:10

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 19:59
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 19:59
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 19:59
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 19:59
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 19:59
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: C-07-111417
 Collection Date: 14-Nov-2017 10:10

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: AKP	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 19:59
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 19:59
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 19:59
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 19:59
Surr: 1,2-Dichloroethane-d4	87.7			0	70-126	%REC	1	17-Nov-2017 19:59
Surr: 4-Bromofluorobenzene	104			0	81-113	%REC	1	17-Nov-2017 19:59
Surr: Dibromofluoromethane	96.2			0	77-123	%REC	1	17-Nov-2017 19:59
Surr: Toluene-d8	95.0			0	82-127	%REC	1	17-Nov-2017 19:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	04-Dec-2017 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW08-111417
 Collection Date: 14-Nov-2017 11:00

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 20:24
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 20:24
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 20:24
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 20:24
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 20:24
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW08-111417
 Collection Date: 14-Nov-2017 11:00

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 20:24
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 20:24
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:24
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:24
Surr: 1,2-Dichloroethane-d4	88.3			0	70-126	%REC	1	17-Nov-2017 20:24
Surr: 4-Bromofluorobenzene	105			0	81-113	%REC	1	17-Nov-2017 20:24
Surr: Dibromofluoromethane	97.3			0	77-123	%REC	1	17-Nov-2017 20:24
Surr: Toluene-d8	93.4			0	82-127	%REC	1	17-Nov-2017 20:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Dec-2017 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW07-111417
 Collection Date: 14-Nov-2017 11:55

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: AKP	
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 20:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 20:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 20:49
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 20:49
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 20:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW07-111417
 Collection Date: 14-Nov-2017 11:55

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: AKP	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 20:49
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 20:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 20:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 20:49
Surr: 1,2-Dichloroethane-d4	89.1			0	70-126	%REC	1	17-Nov-2017 20:49
Surr: 4-Bromofluorobenzene	103			0	81-113	%REC	1	17-Nov-2017 20:49
Surr: Dibromofluoromethane	99.3			0	77-123	%REC	1	17-Nov-2017 20:49
Surr: Toluene-d8	92.8			0	82-127	%REC	1	17-Nov-2017 20:49
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	04-Dec-2017 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW13-111417
 Collection Date: 14-Nov-2017 12:35

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: AKP	
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 21:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 21:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 21:13
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 21:13
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 21:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW13-111417
 Collection Date: 14-Nov-2017 12:35

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 21:13
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 21:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Trichloroethene	1.5		0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:13
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>88.3</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:13</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>104</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:13</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.8</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:13</i>
<i>Surr: Toluene-d8</i>	<i>93.6</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:13</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Dec-2017 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 130-111417
 Collection Date: 14-Nov-2017 13:25

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 21:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 21:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 21:38
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 21:38
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 21:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 130-111417
 Collection Date: 14-Nov-2017 13:25

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 21:38
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 21:38
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 21:38
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Trichloroethene	2.1		0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 21:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 21:38
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.3</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:38</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>104</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:38</i>
<i>Surr: Dibromofluoromethane</i>	<i>96.9</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:38</i>
<i>Surr: Toluene-d8</i>	<i>92.7</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>17-Nov-2017 21:38</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Dec-2017 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW03-11417
 Collection Date: 14-Nov-2017 14:20

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 22:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	17-Nov-2017 22:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	17-Nov-2017 22:02
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	17-Nov-2017 22:02
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	17-Nov-2017 22:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW03-11417
 Collection Date: 14-Nov-2017 14:20

ANALYTICAL REPORT

WorkOrder:HS17110803
 Lab ID:HS17110803-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: AKP	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
cis-1,2-Dichloroethene	0.70	J	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	17-Nov-2017 22:02
Methylene chloride	0.50	U	1.0	0.50	2.0	ug/L	1	17-Nov-2017 22:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	17-Nov-2017 22:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Trichloroethene	5.3		0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	17-Nov-2017 22:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	17-Nov-2017 22:02
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.0</i>			0	<i>70-126</i>	%REC	1	17-Nov-2017 22:02
<i>Surr: 4-Bromofluorobenzene</i>	<i>103</i>			0	<i>81-113</i>	%REC	1	17-Nov-2017 22:02
<i>Surr: Dibromofluoromethane</i>	<i>99.2</i>			0	<i>77-123</i>	%REC	1	17-Nov-2017 22:02
<i>Surr: Toluene-d8</i>	<i>92.6</i>			0	<i>82-127</i>	%REC	1	17-Nov-2017 22:02
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	04-Dec-2017 14:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R305690 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Groundwater						
HS17110803-02	C-07-111417	14 Nov 2017 10:10			17 Nov 2017 19:59	1
HS17110803-03	17WW08-111417	14 Nov 2017 11:00			17 Nov 2017 20:24	1
HS17110803-04	17WW07-111417	14 Nov 2017 11:55			17 Nov 2017 20:49	1
HS17110803-05	17WW13-111417	14 Nov 2017 12:35			17 Nov 2017 21:13	1
HS17110803-06	130-111417	14 Nov 2017 13:25			17 Nov 2017 21:38	1
HS17110803-07	17WW03-111417	14 Nov 2017 14:20			17 Nov 2017 22:02	1
Batch ID R305690 Test Name : LOW LEVEL VOLATILES BY SW8260C Matrix: Water						
HS17110803-01	17TB01-111417	14 Nov 2017 09:10			17 Nov 2017 18:21	1
Batch ID R306512 Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) Matrix: Groundwater						
HS17110803-02	C-07-111417	14 Nov 2017 10:10			04 Dec 2017 14:09	1
HS17110803-03	17WW08-111417	14 Nov 2017 11:00			04 Dec 2017 14:09	1
HS17110803-04	17WW07-111417	14 Nov 2017 11:55			04 Dec 2017 14:09	1
HS17110803-05	17WW13-111417	14 Nov 2017 12:35			04 Dec 2017 14:09	1
HS17110803-06	130-111417	14 Nov 2017 13:25			04 Dec 2017 14:09	1
HS17110803-07	17WW03-111417	14 Nov 2017 14:20			04 Dec 2017 14:09	1

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
MBLK	Sample ID: VBLKW171117	Units: ug/L			Analysis Date: 17-Nov-2017 17:07					
Client ID:	Run ID: VOA2_305690	SeqNo: 4315101		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	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW171117	Units: ug/L		Analysis Date: 17-Nov-2017 17:07					
Client ID:	Run ID: VOA2_305690	SeqNo: 4315101		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	0.50	2.0							U
Naphthalene	0.50	1.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	43.86	1.0	50	0	87.7	70 - 123			
Surr: 4-Bromofluorobenzene	51.14	1.0	50	0	102	82 - 115			
Surr: Dibromofluoromethane	48.75	1.0	50	0	97.5	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690											Instrument: VOA2			Method: SW8260		
MBLK		Sample ID: VBLKW171117				Units: ug/L			Analysis Date: 17-Nov-2017 17:07							
Client ID:		Run ID: VOA2_305690				SeqNo: 4315101		PrepDate:		DF: 1						
Analyte		Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual					
Surr: Toluene-d8		47.11		1.0	50	0	94.2	81 - 120								

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
LCS	Sample ID: VLCSW-171117	Units: ug/L			Analysis Date: 17-Nov-2017 16:17					
Client ID:	Run ID: VOA2_305690	SeqNo: 4315099			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	47.38	1.0	50	0	94.8	77 - 118				
1,1,1-Trichloroethane	48.28	1.0	50	0	96.6	70 - 130				
1,1,2,2-Tetrachloroethane	41.76	1.0	50	0	83.5	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	51.19	1.0	50	0	102	70 - 130				
1,1,2-Trichloroethane	46.6	1.0	50	0	93.2	77 - 113				
1,1-Dichloroethane	47	1.0	50	0	94.0	71 - 122				
1,1-Dichloroethene	53.54	1.0	50	0	107	70 - 130				
1,1-Dichloropropene	50.1	1.0	50	0	100	78 - 118				
1,2,3-Trichlorobenzene	47.08	1.0	50	0	94.2	70 - 130				
1,2,3-Trichloropropane	46.67	1.0	50	0	93.3	70 - 127				
1,2,4-Trichlorobenzene	47.49	1.0	50	0	95.0	77 - 126				
1,2,4-Trimethylbenzene	46.78	1.0	50	0	93.6	73 - 121				
1,2-Dibromo-3-chloropropane	48.05	1.0	50	0	96.1	70 - 130				
1,2-Dibromoethane	48.91	1.0	50	0	97.8	76 - 123				
1,2-Dichlorobenzene	41.87	1.0	50	0	83.7	77 - 113				
1,2-Dichloroethane	49.32	1.0	50	0	98.6	70 - 124				
1,2-Dichloropropane	44.95	1.0	50	0	89.9	72 - 119				
1,3,5-Trimethylbenzene	48.73	1.0	50	0	97.5	75 - 118				
1,3-Dichlorobenzene	41.17	1.0	50	0	82.3	78 - 118				
1,3-Dichloropropane	46.72	1.0	50	0	93.4	75 - 116				
1,4-Dichlorobenzene	41.94	1.0	50	0	83.9	79 - 113				
2,2-Dichloropropane	49.5	1.0	50	0	99.0	70 - 130				
2-Butanone	102.3	2.0	100	0	102	70 - 130				
2-Chlorotoluene	47.64	1.0	50	0	95.3	70 - 128				
2-Hexanone	94.92	2.0	100	0	94.9	70 - 130				
4-Chlorotoluene	47.63	1.0	50	0	95.3	74 - 126				
4-Isopropyltoluene	39.97	1.0	50	0	79.9	74 - 126				
4-Methyl-2-pentanone	96.04	2.0	100	0	96.0	70 - 130				
Acetone	98.78	2.0	100	0	98.8	70 - 130				
Benzene	45.87	1.0	50	0	91.7	74 - 120				
Bromobenzene	42.26	1.0	50	0	84.5	78 - 113				
Bromochloromethane	50.2	1.0	50	0	100	76 - 124				
Bromodichloromethane	49.84	1.0	50	0	99.7	74 - 122				
Bromoform	54.31	1.0	50	0	109	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-171117		Units: ug/L		Analysis Date: 17-Nov-2017 16:17				
Client ID:		Run ID: VOA2_305690		SeqNo: 4315099		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	53.07	1.0	50	0	106	70 - 130				
Carbon disulfide	100.8	2.0	100	0	101	70 - 130				
Carbon tetrachloride	51.2	1.0	50	0	102	71 - 125				
Chlorobenzene	44.87	1.0	50	0	89.7	76 - 113				
Chloroethane	50.76	1.0	50	0	102	70 - 130				
Chloroform	46.48	1.0	50	0	93.0	71 - 121				
Chloromethane	44.82	1.0	50	0	89.6	70 - 129				
cis-1,2-Dichloroethene	48.92	1.0	50	0	97.8	75 - 122				
cis-1,3-Dichloropropene	51.26	1.0	50	0	103	73 - 127				
Dibromochloromethane	50.18	1.0	50	0	100	77 - 122				
Dibromomethane	51.46	1.0	50	0	103	78 - 121				
Dichlorodifluoromethane	56.07	1.0	50	0	112	70 - 130				
Ethylbenzene	44.45	1.0	50	0	88.9	77 - 117				
Hexachlorobutadiene	44.81	1.0	50	0	89.6	70 - 130				
Isopropylbenzene	43.78	1.0	50	0	87.6	73 - 127				
m,p-Xylene	88.5	2.0	100	0	88.5	77 - 122				
Methylene chloride	48.3	2.0	50	0	96.6	70 - 127				
Naphthalene	48.15	1.0	50	0	96.3	70 - 130				
n-Butylbenzene	40.82	1.0	50	0	81.6	72 - 130				
n-Propylbenzene	48.24	1.0	50	0	96.5	73 - 124				
o-Xylene	44.16	1.0	50	0	88.3	75 - 119				
sec-Butylbenzene	40.99	1.0	50	0	82.0	73 - 128				
Styrene	46.76	1.0	50	0	93.5	72 - 126				
tert-Butylbenzene	41.07	1.0	50	0	82.1	73 - 124				
Tetrachloroethene	45.63	1.0	50	0	91.3	76 - 119				
Toluene	43.18	1.0	50	0	86.4	77 - 118				
trans-1,2-Dichloroethene	50.73	1.0	50	0	101	72 - 127				
trans-1,3-Dichloropropene	52.97	1.0	50	0	106	77 - 119				
Trichloroethene	47	1.0	50	0	94.0	77 - 121				
Trichlorofluoromethane	51.66	1.0	50	0	103	70 - 130				
Vinyl chloride	48.89	1.0	50	0	97.8	70 - 130				
Surr: 1,2-Dichloroethane-d4	46.47	1.0	50	0	92.9	70 - 130				
Surr: 4-Bromofluorobenzene	54.18	1.0	50	0	108	82 - 115				
Surr: Dibromofluoromethane	47.03	1.0	50	0	94.1	73 - 126				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
LCS	Sample ID: VLCSW-171117	Units: ug/L			Analysis Date: 17-Nov-2017 16:17					
	Client ID:	Run ID: VOA2_305690	SeqNo: 4315099		PrepDate:		DF: 1			
	Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: Toluene-d8		45.77	1.0	50	0	91.5	81 - 120			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
MS		Sample ID: HS17110677-07MS		Units: ug/L		Analysis Date: 18-Nov-2017 01:58				
Client ID:		Run ID: VOA2_305690		SeqNo: 4315122		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	47.12	1.0	50	0	94.2	70 - 120				
1,1,1-Trichloroethane	52.89	1.0	50	0	106	70 - 130				
1,1,2,2-Tetrachloroethane	39.4	1.0	50	0	78.8	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	55.77	1.0	50	0	112	70 - 130				
1,1,2-Trichloroethane	44.97	1.0	50	0	89.9	70 - 117				
1,1-Dichloroethane	50.03	1.0	50	0	100	70 - 127				
1,1-Dichloroethene	56.87	1.0	50	0	114	70 - 130				
1,1-Dichloropropene	54	1.0	50	0	108	70 - 129				
1,2,3-Trichlorobenzene	43.37	1.0	50	0	86.7	70 - 130				
1,2,3-Trichloropropane	43.13	1.0	50	0	86.3	70 - 130				
1,2,4-Trichlorobenzene	44.28	1.0	50	0	88.6	70 - 125				
1,2,4-Trimethylbenzene	47.04	1.0	50	0	94.1	70 - 125				
1,2-Dibromo-3-chloropropane	42.84	1.0	50	0	85.7	70 - 130				
1,2-Dibromoethane	47	1.0	50	0	94.0	70 - 124				
1,2-Dichlorobenzene	41.79	1.0	50	0	83.6	70 - 115				
1,2-Dichloroethane	48.85	1.0	50	0.9833	95.7	70 - 127				
1,2-Dichloropropane	46.03	1.0	50	0	92.1	70 - 122				
1,3,5-Trimethylbenzene	50.38	1.0	50	0	101	70 - 126				
1,3-Dichlorobenzene	41.44	1.0	50	0	82.9	70 - 119				
1,3-Dichloropropane	45.36	1.0	50	0	90.7	70 - 121				
1,4-Dichlorobenzene	42.29	1.0	50	0	84.6	70 - 114				
2,2-Dichloropropane	46.05	1.0	50	0	92.1	70 - 130				
2-Butanone	91.97	2.0	100	0	92.0	70 - 130				
2-Chlorotoluene	48.94	1.0	50	0	97.9	70 - 130				
2-Hexanone	85.76	2.0	100	0	85.8	70 - 130				
4-Chlorotoluene	48.93	1.0	50	0	97.9	70 - 130				
4-Isopropyltoluene	41.4	1.0	50	0	82.8	70 - 130				
4-Methyl-2-pentanone	86.99	2.0	100	0	87.0	70 - 130				
Acetone	88.06	2.0	100	0	88.1	70 - 130				
Benzene	47.8	1.0	50	0	95.6	70 - 127				
Bromobenzene	42.53	1.0	50	0	85.1	70 - 115				
Bromochloromethane	51.26	1.0	50	0	103	70 - 127				
Bromodichloromethane	49.92	1.0	50	0	99.8	70 - 124				
Bromoform	49.94	1.0	50	0	99.9	70 - 129				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
MS		Sample ID: HS17110677-07MS		Units: ug/L		Analysis Date: 18-Nov-2017 01:58				
Client ID:		Run ID: VOA2_305690		SeqNo: 4315122		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	63.73	1.0	50	0	127	70 - 130				
Carbon disulfide	109.6	2.0	100	0	110	70 - 130				
Carbon tetrachloride	55.17	1.0	50	0	110	70 - 130				
Chlorobenzene	45.27	1.0	50	0	90.5	70 - 114				
Chloroethane	55.1	1.0	50	0	110	70 - 130				
Chloroform	48.29	1.0	50	0	96.6	70 - 125				
Chloromethane	48.01	1.0	50	0	96.0	70 - 130				
cis-1,2-Dichloroethene	72.6	1.0	50	19.48	106	70 - 128				
cis-1,3-Dichloropropene	49.49	1.0	50	0	99.0	70 - 125				
Dibromochloromethane	49	1.0	50	0	98.0	70 - 124				
Dibromomethane	49.57	1.0	50	0	99.1	70 - 124				
Dichlorodifluoromethane	93.89	1.0	50	0	188	70 - 130				S
Ethylbenzene	46.16	1.0	50	0	92.3	70 - 124				
Hexachlorobutadiene	43.69	1.0	50	0	87.4	70 - 130				
Isopropylbenzene	45.76	1.0	50	0	91.5	70 - 130				
m,p-Xylene	90.61	2.0	100	0	90.6	70 - 130				
Methylene chloride	47.11	2.0	50	0	94.2	70 - 128				
Naphthalene	44.58	1.0	50	0	89.2	70 - 130				
n-Butylbenzene	41.48	1.0	50	0	83.0	70 - 130				
n-Propylbenzene	51.24	1.0	50	0	102	70 - 130				
o-Xylene	45.24	1.0	50	0	90.5	70 - 124				
sec-Butylbenzene	43.64	1.0	50	0	87.3	70 - 130				
Styrene	47.43	1.0	50	0	94.9	70 - 130				
tert-Butylbenzene	43.15	1.0	50	0	86.3	70 - 130				
Tetrachloroethene	48.44	1.0	50	1.018	94.9	70 - 130				
Toluene	44.63	1.0	50	0	89.3	70 - 123				
trans-1,2-Dichloroethene	54.24	1.0	50	0	108	70 - 130				
trans-1,3-Dichloropropene	49.43	1.0	50	0	98.9	70 - 121				
Trichloroethene	261.5	1.0	50	182	159	70 - 129				SE
Trichlorofluoromethane	61.01	1.0	50	0	122	70 - 130				
Vinyl chloride	60.3	1.0	50	0	121	70 - 130				
Surr: 1,2-Dichloroethane-d4	47.08	1.0	50	0	94.2	70 - 126				
Surr: 4-Bromofluorobenzene	54.28	1.0	50	0	109	81 - 113				
Surr: Dibromofluoromethane	47.01	1.0	50	0	94.0	77 - 123				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
MS	Sample ID:	HS17110677-07MS			Units: ug/L		Analysis Date: 18-Nov-2017 01:58			
	Client ID:	Run ID: VOA2_305690		SeqNo: 4315122		PrepDate:		DF: 1		
	Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: Toluene-d8		45.85	1.0	50	0	91.7	82 - 127			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260						
MSD		Sample ID: HS17110677-07MSD		Units: ug/L		Analysis Date: 18-Nov-2017 02:22				
Client ID:		Run ID: VOA2_305690		SeqNo: 4315123		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	46.36	1.0	50	0	92.7	70 - 120	47.12	1.62	20	
1,1,1-Trichloroethane	51.19	1.0	50	0	102	70 - 130	52.89	3.27	20	
1,1,2,2-Tetrachloroethane	39.69	1.0	50	0	79.4	70 - 123	39.4	0.742	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	55.05	1.0	50	0	110	70 - 130	55.77	1.29	20	
1,1,2-Trichloroethane	44.16	1.0	50	0	88.3	70 - 117	44.97	1.82	20	
1,1-Dichloroethane	48.97	1.0	50	0	97.9	70 - 127	50.03	2.15	20	
1,1-Dichloroethene	52.98	1.0	50	0	106	70 - 130	56.87	7.08	20	
1,1-Dichloropropene	55.18	1.0	50	0	110	70 - 129	54	2.16	20	
1,2,3-Trichlorobenzene	44.25	1.0	50	0	88.5	70 - 130	43.37	2.01	20	
1,2,3-Trichloropropane	43.28	1.0	50	0	86.6	70 - 130	43.13	0.341	20	
1,2,4-Trichlorobenzene	45.24	1.0	50	0	90.5	70 - 125	44.28	2.14	20	
1,2,4-Trimethylbenzene	47.61	1.0	50	0	95.2	70 - 125	47.04	1.22	20	
1,2-Dibromo-3-chloropropane	45.95	1.0	50	0	91.9	70 - 130	42.84	7	20	
1,2-Dibromoethane	46.8	1.0	50	0	93.6	70 - 124	47	0.444	20	
1,2-Dichlorobenzene	42.13	1.0	50	0	84.3	70 - 115	41.79	0.799	20	
1,2-Dichloroethane	49.1	1.0	50	0.9833	96.2	70 - 127	48.85	0.5	20	
1,2-Dichloropropane	45.58	1.0	50	0	91.2	70 - 122	46.03	0.981	20	
1,3,5-Trimethylbenzene	50.32	1.0	50	0	101	70 - 126	50.38	0.135	20	
1,3-Dichlorobenzene	41.43	1.0	50	0	82.9	70 - 119	41.44	0.0246	20	
1,3-Dichloropropane	44.65	1.0	50	0	89.3	70 - 121	45.36	1.58	20	
1,4-Dichlorobenzene	41.71	1.0	50	0	83.4	70 - 114	42.29	1.38	20	
2,2-Dichloropropane	45.15	1.0	50	0	90.3	70 - 130	46.05	1.97	20	
2-Butanone	91.41	2.0	100	0	91.4	70 - 130	91.97	0.615	20	
2-Chlorotoluene	48.49	1.0	50	0	97.0	70 - 130	48.94	0.912	20	
2-Hexanone	87.03	2.0	100	0	87.0	70 - 130	85.76	1.47	20	
4-Chlorotoluene	48.49	1.0	50	0	97.0	70 - 130	48.93	0.912	20	
4-Isopropyltoluene	41.46	1.0	50	0	82.9	70 - 130	41.4	0.142	20	
4-Methyl-2-pentanone	87.74	2.0	100	0	87.7	70 - 130	86.99	0.859	20	
Acetone	88.49	2.0	100	0	88.5	70 - 130	88.06	0.488	20	
Benzene	47.16	1.0	50	0	94.3	70 - 127	47.8	1.33	20	
Bromobenzene	41.84	1.0	50	0	83.7	70 - 115	42.53	1.64	20	
Bromochloromethane	50.13	1.0	50	0	100	70 - 127	51.26	2.24	20	
Bromodichloromethane	49.66	1.0	50	0	99.3	70 - 124	49.92	0.509	20	
Bromoform	50.49	1.0	50	0	101	70 - 129	49.94	1.1	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690		Instrument: VOA2		Method: SW8260					
MSD		Sample ID: HS17110677-07MSD		Units: ug/L		Analysis Date: 18-Nov-2017 02:22			
Client ID:		Run ID: VOA2_305690		SeqNo: 4315123		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	59.81	1.0	50	0	120	70 - 130	63.73	6.34	20
Carbon disulfide	107.8	2.0	100	0	108	70 - 130	109.6	1.63	20
Carbon tetrachloride	54.84	1.0	50	0	110	70 - 130	55.17	0.597	20
Chlorobenzene	44.78	1.0	50	0	89.6	70 - 114	45.27	1.08	20
Chloroethane	55.84	1.0	50	0	112	70 - 130	55.1	1.33	20
Chloroform	46.48	1.0	50	0	93.0	70 - 125	48.29	3.82	20
Chloromethane	46.33	1.0	50	0	92.7	70 - 130	48.01	3.56	20
cis-1,2-Dichloroethene	67.52	1.0	50	19.48	96.1	70 - 128	72.6	7.26	20
cis-1,3-Dichloropropene	48.68	1.0	50	0	97.4	70 - 125	49.49	1.65	20
Dibromochloromethane	48.16	1.0	50	0	96.3	70 - 124	49	1.73	20
Dibromomethane	50.43	1.0	50	0	101	70 - 124	49.57	1.71	20
Dichlorodifluoromethane	90.45	1.0	50	0	181	70 - 130	93.89	3.73	20 S
Ethylbenzene	45.65	1.0	50	0	91.3	70 - 124	46.16	1.11	20
Hexachlorobutadiene	44.89	1.0	50	0	89.8	70 - 130	43.69	2.7	20
Isopropylbenzene	45.78	1.0	50	0	91.6	70 - 130	45.76	0.0271	20
m,p-Xylene	89.6	2.0	100	0	89.6	70 - 130	90.61	1.12	20
Methylene chloride	48.31	2.0	50	0	96.6	70 - 128	47.11	2.53	20
Naphthalene	45.6	1.0	50	0	91.2	70 - 130	44.58	2.27	20
n-Butylbenzene	41.76	1.0	50	0	83.5	70 - 130	41.48	0.663	20
n-Propylbenzene	50.79	1.0	50	0	102	70 - 130	51.24	0.878	20
o-Xylene	45.11	1.0	50	0	90.2	70 - 124	45.24	0.299	20
sec-Butylbenzene	43.77	1.0	50	0	87.5	70 - 130	43.64	0.317	20
Styrene	46.91	1.0	50	0	93.8	70 - 130	47.43	1.12	20
tert-Butylbenzene	43.41	1.0	50	0	86.8	70 - 130	43.15	0.6	20
Tetrachloroethene	47.56	1.0	50	1.018	93.1	70 - 130	48.44	1.85	20
Toluene	43.83	1.0	50	0	87.7	70 - 123	44.63	1.82	20
trans-1,2-Dichloroethene	52.87	1.0	50	0	106	70 - 130	54.24	2.55	20
trans-1,3-Dichloropropene	49.94	1.0	50	0	99.9	70 - 121	49.43	1.02	20
Trichloroethene	235.5	1.0	50	182	107	70 - 129	261.5	10.5	20 E
Trichlorofluoromethane	59.3	1.0	50	0	119	70 - 130	61.01	2.84	20
Vinyl chloride	59.05	1.0	50	0	118	70 - 130	60.3	2.09	20
Surr: 1,2-Dichloroethane-d4	45.97	1.0	50	0	91.9	70 - 126	47.08	2.39	20
Surr: 4-Bromofluorobenzene	54.09	1.0	50	0	108	81 - 113	54.28	0.354	20
Surr: Dibromofluoromethane	46.61	1.0	50	0	93.2	77 - 123	47.01	0.85	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

QC BATCH REPORT

Batch ID: R305690											Instrument: VOA2			Method: SW8260		
MSD		Sample ID: HS17110677-07MSD			Units: ug/L			Analysis Date: 18-Nov-2017 02:22								
Client ID:		Run ID: VOA2_305690			SeqNo: 4315123		PrepDate:		DF: 1							
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual					
Surr: Toluene-d8		45.28	1.0	50	0	90.6	82 - 127	45.85	1.26	20						

The following samples were analyzed in this batch:

HS17110803-01	HS17110803-02	HS17110803-03	HS17110803-04
HS17110803-05	HS17110803-06	HS17110803-07	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 04-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110803

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Carolina	624-2017	31-Dec-2017
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018

ALS Group USA, Corp

Date: 04-Dec-17

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS17110803

Date/Time Received: **15-Nov-2017 08:40**
 Received by: **JRM**

Checklist completed by:	<u>Jared R. Makan</u>	16-Nov-2017	Reviewed by:	<u>Corey Grandits</u>	19-Nov-2017
	eSignature	Date		eSignature	Date

Matrices: **Water**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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):	1.8c/2.1c UC/C	IR25
Cooler(s)/Kit(s):	42980	
Date/Time sample(s) sent to storage:	11/16/2017 13:31	

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:

APTIM		Page 1 of 1													
COC ID:		17-NOV2017-GW-ALSHT-111417				TURNAROUND TIME: normal				RUSH:					
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO					
Facility Name		Longhorn AAP				Lab Name		ALS Laboratories		Email Invoice To		FedInvoices@C81FederalServices.com			
Project Number		501032				Lab Contact		Sonia West		Email Report To		Sharon.Pennington@C81FederalServices.com			
		LHAAP-17				Email		Sonia.West@alsglobal.com		Mail Reports To		Sharon Pennington			
Address		1203-B East Grand Avenue				Address		10450 Stanchiff Rd., Suite 210		Address		2410 Cherahala Blvd.			
City		Marshall		State	TX	City		Houston	State	TX	City		Knoxville	State	TN
Postal Code		75670		Country	USA	Postal Code		77099	Country	USA	Postal Code		37932	Country	USA
Phone Number		713.243.7264				Phone Number		281.575.2132 or 281.530.5656				Shipping Company		FEDEX	
Project Manager		Praveen Srivastav													
SAMPLE DETAILS						ANALYSIS REQUESTED									
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850				
17TB01-111417	FIELDQC	n/a	n/a	n/a	LIQ	11/14/2017	910	2		2					
C-07-111417	C-07	28.55	28.95	ft	GW	11/14/2017	1010	4		3	1				
17WW08-111417	17WW08	11.45	12.15	ft	GW	11/14/2017	1100	4		3	1				
17WW07-111417	17WW07	11.65	12.1	ft	GW	11/14/2017	1155	4		3	1				
17WW13-111417	17WW13	11	11.6	ft	GW	11/14/2017	1235	4		3	1				
130-111417	130	9	11.9	ft	GW	11/14/2017	1325	4		3	1				
17WW03-111417	17WW03	11.1	11.65	ft	GW	11/14/2017	1420	4		3	1				
HS17110803 Aptim Environmental & Infrastructure, Inc. Longhorn Army Ammunition Plant 															
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS					RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION			DATE/TIME			
					David R. / APTIM		11/14/17		Jm / mms			11/15/17 08:00			
					David R. / APTIM		1550								

Order 42486
Temp 1.2

1425
(40.3)

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>11/14/17</i>	Time:	Date: <i>11/15/17</i>
	Name: <i>AS</i>	Company: <i>AS</i>	

42980

NOV 15 2017

FedEx
 TRX#
 [D221] 7376 9749 7385

WED - 15 NOV 10:30A
 PRIORITY OVERNIGHT

AB SGRA 42980

77099
 TX-US IAH





Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1732091; 1732092; 1732412

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2002 (203769)

General Set Information: There were nineteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Sample 1732092002 was re-analyzed and reported at a 1 in 1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 5760963) was less than 1/2 the CRDL. The recovery for the LCS (576094) was within acceptable parameters.

MS/MSD Analysis: The matrix spike and matrix spike duplicate (MS/MSD) was performed on sample 1732091001 (Client ID: 50WW27-111017). The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.



Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): None were required for this set.

Sample Calculation: Samples were reported in $\mu\text{g/L}$. Results were calculated in $\mu\text{g/L}$ by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve ($\mu\text{g/L}$)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.0. Manual Integrations were performed for some of the Initial Calibration analyses (datafiles: 28NOVP01/02) along with datafiles 29NOVP03/19.

Thomas Bosch December 03, 2017
Date



00898494

ANALYTICAL REPORT

Report Date: December 04, 2017

Sonia West
ALS Environmental
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Phone: (281) 530-5656

E-mail: Sonia.West@alsglobal.com

Workorder: **34-1732412**

Project ID: HS17110803 111417

Purchase Order: HS17110803

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
C-07-111417	1732412001	11/14/17	11/17/17	
17WW08-111417	1732412002	11/14/17	11/17/17	
17WW07-111417	1732412003	11/14/17	11/17/17	
17WW13-111417	1732412004	11/14/17	11/17/17	
130-111417	1732412005	11/14/17	11/17/17	
17WW03-111417	1732412006	11/14/17	11/17/17	

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Environmental www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1732412**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: C-07-111417			Sampling Site: NA		Collected: 11/14/2017	
Lab ID: 1732412001			Media: 250 mL Nalgene		Received: 11/17/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2002 (HBN: 203769) Analyzed: 11/29/2017 14:51		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	4.4	1.0	2.0	4.0	1	

Sample ID: 17WW08-111417			Sampling Site: NA		Collected: 11/14/2017	
Lab ID: 1732412002			Media: 250 mL Nalgene		Received: 11/17/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2002 (HBN: 203769) Analyzed: 11/29/2017 15:10		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW07-111417			Sampling Site: NA		Collected: 11/14/2017	
Lab ID: 1732412003			Media: 250 mL Nalgene		Received: 11/17/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2002 (HBN: 203769) Analyzed: 11/29/2017 15:29		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW13-111417			Sampling Site: NA		Collected: 11/14/2017	
Lab ID: 1732412004			Media: 250 mL Nalgene		Received: 11/17/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2002 (HBN: 203769) Analyzed: 11/29/2017 15:48		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Workorder: **34-1732412**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 130-111417			Sampling Site: NA		Collected: 11/14/2017	
Lab ID: 1732412005			Media: 250 mL Nalgene		Received: 11/17/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2002 (HBN: 203769) Analyzed: 11/29/2017 16:07		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	2.5	1.0	2.0	4.0	1	J

Sample ID: 17WW03-111417			Sampling Site: NA		Collected: 11/14/2017	
Lab ID: 1732412006			Media: 250 mL Nalgene		Received: 11/17/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2002 (HBN: 203769) Analyzed: 11/29/2017 16:28		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 203769)

Sample 1732092002 was re-analyzed and reported at a 1 in 1,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/03/2017 11:14	/S/ Stephen Brose 12/04/2017 12:03

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: **34-1732412**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint ,Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com



ANALYTICAL REPORT

Workorder: 34-1732412

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< This testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00898499

Analysis Information

Workorder: 1732412

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850

Basis: DoD QSM

Batch: NA

Batch: ELMS/2002 (HBN: 203769)

Prepared By: NA

Analyzed By: Thomas Bosch

Blank

LMB: 576093

Analyzed: 11/29/2017 09:25

Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 576094

Analyzed: 11/29/2017 09:44

Dilution: 1

Units: ug/L

Analyte	Result	Target	% Rec	QC Limits
Perchlorate	5.04	5.00	101	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1732091001

Analyzed: 11/29/2017 10:03

Dilution: 1

Units: ug/L

MS: 576095

Analyzed: 11/29/2017 17:06

Dilution: 1

Units: ug/L

MSD: 576096

Analyzed: 11/29/2017 17:25

Dilution: 1

Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	4.82	5	96.4	78.8 123.8	4.71	94.2	2.25	0.0 20.0

Continuing Calibration Verification

CCV: 576090

Analyzed: 11/29/2017 08:26

Units: ug/L

Criteria: $\pm 15\%$

CCV: 576097

Analyzed: 11/29/2017 13:15

Units: ug/L

Criteria: $\pm 15\%$

CCV: 576099

Analyzed: 11/29/2017 17:44

Units: ug/L

Criteria: $\pm 15\%$

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	24.2	25.0	96.9	22.4	25.0	89.8	26.2	25.0	105

Interference Check Sample

ICSA: 576092

Analyzed: 11/29/2017 09:06

Units: ug/L

Criteria: $\pm 30\%$

Analyte	Result	Target	% Rec.
Perchlorate	1.27	1.00	127

Limit of Detection Verification

LODV: 576091

Analyzed: 11/29/2017 08:47

Units: ug/L

Criteria: $\pm 50\%$

LODV: 576098

Analyzed: 11/29/2017 13:34

Units: ug/L

Criteria: $\pm 50\%$

LODV: 576100

Analyzed: 11/29/2017 18:03

Units: ug/L

Criteria: $\pm 50\%$

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	1.05	1.00	105	0.936	1.00	93.6	1.15	1.00	115



Quality Control Sample Batch Report

00898500

Analysis Information

Workorder: 1732412

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850

Basis: DoD QSM

Batch: NA

Batch: ELMS/2002 (HBN: 203769)

Prepared By: NA

Analyzed By: Thomas Bosch

Comments

Sample 1732092002 was re-analyzed and reported at a 1 in 1,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/03/2017 11:14	/S/ Stephen Brose 12/04/2017 12:03

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable



W

1732412

18698/#2

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Contract Chain of Custody

COC ID: 8058

1732412

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Sonia West
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Sonia.West@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: HS17110803
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS17110803-02	C-07-111417	Groundwater	14 Nov 2017 10:10
	SUB_Perch-6850			01 Dec 2017
2.	HS17110803-03	17WW08-111417	Groundwater	14 Nov 2017 11:00
	SUB_Perch-6850			01 Dec 2017
3.	HS17110803-04	17WW07-111417	Groundwater	14 Nov 2017 11:55
	SUB_Perch-6850			01 Dec 2017
4.	HS17110803-05	17WW13-111417	Groundwater	14 Nov 2017 12:35
	SUB_Perch-6850			01 Dec 2017
5.	HS17110803-06	130-111417	Groundwater	14 Nov 2017 13:25
	SUB_Perch-6850			01 Dec 2017
6.	HS17110803-07	17WW03-111417	Groundwater	14 Nov 2017 14:20
	SUB_Perch-6850			01 Dec 2017

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

WARRANTY AND LIMITATION OF REMEDY

**Subcontract Chain of Custody****COC ID: 8058**

Relinquished By:

J. Winkler

Date/Time:

11/16/17 18:00

Received By:

Julia Winkler

Date/Time:

11/17/17 11:30

Cooler ID(s):

9023

Temperature(s):

6°C

ALS - SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>Hansen ALS</u>		Project/Task/Site: <u>732412</u>				
Date/Time of Receipt: <u>11/17/17 1130</u>		Number of Coolers Received: _____				
Condition of Coolers: <u>Acceptable/Unacceptable</u> Cooler Custody Seals: <u>Present/Absent/NA</u> <u>Intact/Broken/NA</u>		Temperature Control: <u>Present/Not Included</u> Location Temp Taken: <u>Control/Between Samples</u> Are all temperatures within project specific guidelines? <u>Yes/No/NA</u> VOA Headspace Present? <u>Yes/No/NA</u>				
Container Custody Seals: <u>Present/Absent/NA</u> <u>Intact/Broken/NA</u> Ice Present: <u>Yes/No/NA</u> <u>Frozen/Melted/NA</u>						
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	TOC Preserved	Yes/No/NA

Cooler Received	ALS Cooler No.	Temp.	Cooler Received	ALS Cooler No.	Temp.	Cooler Received	ALS Cooler No.	Temp.
1	C17-8023	6 °C	4	C17-	°C	7	C17-	°C
2	C17-	°C	5	C17-	°C	8	C17-	°C
3	C17-	°C	6	C17-	°C	9	C17-	°C

Taken By: Julie Weirath Julie Weirath 11/17/17
Signature Printed Name Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler ☐ Cooler Conditions ☐ Missing Paperwork ☐ Missing/Incorrect Bottle Labels	☐ Missing Samples/Bottles ☐ Broken/Leaking Samples ☐ Incorrect Bottle Type ☐ Cooler Temperatures Out of Range	☐ Incorrect Preservation ☐ pH Criteria Not Met ☐ Residual Chlorine Present ☐ Head Space in Bottles	☐ Insufficient Sample Volume ☐ Chain of Custody Problems ☐ Other:
---	--	---	--

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

E-mailed to Client? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT		
PROJECT MANAGER COMMENTS:		
ALS Project Manager: _____	Returned to Sample Receipt by: _____	Date: _____
Printed Name	Signature	

CRIR.dot

Revised 1/1/15



ORIGIN ID:SGRA (281) 530-5656
 SHIPPING DEPT
 ALS LABORATORY GROUP
 10450 STANCLIFF RD
 SUITE 210
 HOUSTON, TX 77099
 UNITED STATES US

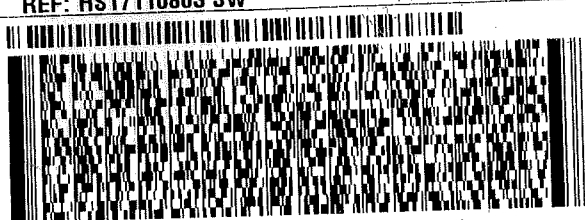
SHIP DATE: 16NOV17
 ACTWGT: 16.90 LB
 CAD: 300130/CAFE3108
 DIMS: 14x11x10 IN
 BILL SENDER

TO: **PAUL POPE**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS17110803 SW



FedEx
Express



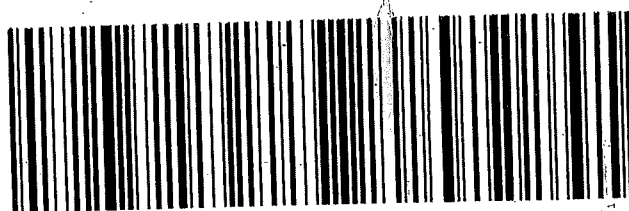
J17101610200110

TRK# 7376 9750 2540
 0201

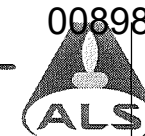
FRI - 17 NOV 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC



[illegible][illegible]



Batch Worklist

Batch: ELMS/ 2002

Created: 11/28/2017 12:26

Instrument:

HBN: 203769

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP



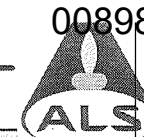
Workorder: 1732091 [ENV_LVL4]

Workorder: 1732092 [ENV_LVL4]

Workorder: 1732412 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	576090	CCV for HBN 203769 [ELMS/2002]				CCV	3		E685041C3Q	5311		12/4/2017	
2	576091	LODV for HBN 203769 [ELMS/2002]				LODV	3		E6850..D3Q	5311		12/4/2017	
3	576092	ICS for HBN 203769 [ELMS/2002]				ICS	3		E6850..D3Q	5311		12/4/2017	
4	576093	LMB for HBN 203769 [ELMS/2002]				LMB	3		E6850Q413Q	5311		12/4/2017	
5	576094	LCS for HBN 203769 [ELMS/2002]				LCS	3		E6850Q413Q	5311		12/4/2017	
6	1732091001	50WW27-111017				SAMPLE	3	1732091001-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
7	576095	50WW27-111017(1732091001MS)				MS	3		E6850Q413Q	5311		12/4/2017	
8	576096	50WW27-111017(1732091001MSD)				MSD	3		E6850Q413Q	5311		12/4/2017	
9	1732091002	50WW15-111017				SAMPLE	3	1732091002-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
10	1732091003	50WW05-111017				SAMPLE	3	1732091003-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
11	1732091004	50WW05-111017-FD				FLDDUP	3	1732091004-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
12	1732091005	50WW10-111017				SAMPLE	3	1732091005-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
13	1732091006	50WW09-111017				SAMPLE	3	1732091006-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
14	1732091007	50WW21-111017				SAMPLE	3	1732091007-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
15	1732091008	50WW24-111017				SAMPLE	3	1732091008-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
16	1732091009	50WW18-111017				SAMPLE	3	1732091009-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
17	1732091010	50WW17-111017				SAMPLE	3	1732091010-A	E6850Q41.3	5480	12/8/2017	12/4/2017	
18	576097	CCV for HBN 203769 [ELMS/2002]				CCV	3		E685041C3Q	5311		12/4/2017	
19	576098	LODV for HBN 203769 [ELMS/2002]				LODV	3		E6850..D3Q	5311		12/4/2017	
20	1732092001	50WW23-111417				SAMPLE	3	1732092001-A	E6850Q41.3	5480	12/12/2017	12/4/2017	
21	1732092002	50WW12-111417				SAMPLE	3	1732092002-A	E6850Q41.3	5480	12/12/2017	12/4/2017	
22	1732092003	50WW16-111417				SAMPLE	3	1732092003-A	E6850Q41.3	5480	12/12/2017	12/4/2017	
23	1732412001	C-07-111417				SAMPLE	3	1732412001-A	E6850Q41.3	5480	12/12/2017	12/5/2017	
24	1732412002	17WW08-111417				SAMPLE	3	1732412002-A	E6850Q41.3	5480	12/12/2017	12/5/2017	
25	1732412003	17WW07-111417				SAMPLE	3	1732412003-A	E6850Q41.3	5480	12/12/2017	12/5/2017	
26	1732412004	17WW13-111417				SAMPLE	3	1732412004-A	E6850Q41.3	5480	12/12/2017	12/5/2017	
27	1732412005	130-111417				SAMPLE	3	1732412005-A	E6850Q41.3	5480	12/12/2017	12/5/2017	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
28	1732412006	17WW03-111417				SAMPLE	3	1732412006-A	E6850Q41.3	5480	12/12/2017	12/5/2017	
29	576099	CCV for HBN 203769 [ELMS/2002]				CCV	3		E685041C3Q	5311		12/4/2017	
30	576100	LODV for HBN 203769 [ELMS/2002]				LODV	3		E6850..D3Q	5311		12/4/2017	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #()'s: 1732091 (001-10); 1732092 (001-03); 1732412 (001-06)

ELMS Batch/HBN ID: 2002 (203769)

Prep Date: 11/29/2017 Analysis Date: 11/29/2017 Analyst: T. Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2017\NOV\29NOV17P.s

Reported DL: 1.0µg/L Reported LOD: 2.0µg/L Reported LOQ: 4.0µg/L

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by **TNB**. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot DI735)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot DI735)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 38780. Dilutions of Working Standard Solution ID 32373 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 11/28/2017, sequence 28NOV17P.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 3 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
4.0	0.65
5.0	0.25
14.5	0.25
15.0	0.65
17.5	0.65

QC DATA: 5.0µL of QC Solution Horizon ID 36749 was used for LCS 576094; Target = 5.0µg/L. ASTM type II water was used for LMB 576093.

MS/MSD: MS/MSD was performed on sample 1732091001 (Client ID: 50WW27-111017). 5.0µl of Working Standard Solution Horizon ID 36735 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Sample 1732092002 was re-analyzed and reported at a 1 in 1,000 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2017\NOV\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for some of the Initial Calibration analyses (datafiles: 28NOVP01,02) along with datafiles 29NOV03/19.
- 5) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2017\CLO4-203769-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 36735		Created By: T. Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/10/2017	Expires: 05/10/2018		
MFG Lot: TNB: 05/10/17		Lab Lot: CLO4 WRK	Usable: Yes		
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36734	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	05/10/2018



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 36733		Created By: T. Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 5/10/2017	Expires: 10/4/2018
MFG Lot: 216095148		Lab Lot: CLO4 STOCK	Usable: Yes
Part ID: IC-PER-10X-1			
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

**STANDARD REPORT****Constituent****Solvent Standard - ASTM H2O**

ASTM H2O		Description - ASTM Type II Water	
Standard: 109		Created By: ALS Support (Lims)	
MFG: DCL In House		Amount: 1000 L	
MFG Lot:		Create Date: 10/6/2005	
Part ID:		Expires: 11/7/2025	
		Usable: Yes	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 36734		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/10/2017		Expires: 05/10/2018	
MFG Lot: TNB: 05/10/17		Lab Lot: CLO4 INT		Usable: Yes	
Part ID:					
Pos.	Analyte	Name			Concentration
1	14797-73-0	Perchlorate			10 ug/mL
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36733	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	10/04/2018



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 36750		Created By: T. Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/11/2017	Expires: 05/11/2018		
MFG Lot: TNB: 05/11/17		Lab Lot: CLO4 QC WRK 100.ug/L	Usable: Yes		
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36749	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/11/2018



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 36749		Created By: T. Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/11/2017	Expires: 05/11/2018		
MFG Lot: TNB: 05/11/2017		Lab Lot: CLO4 QC INT 10.ug/mL	Usable: Yes		
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109		Created By: ALS Support (Lims)	
MFG: DCL In House		Amount: 1000 L	
MFG Lot:		Create Date: 10/6/2005	
Part ID:		Expires: 11/7/2025	
		Usable: Yes	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748		Created By: T. Bosch	Amount: 100 mL
MFG: Ultra Scientific		Create Date: 5/11/2017	Expires: 3/31/2020
MFG Lot: CP-0860		Lab Lot: CLO4 QC STOCK	Usable: Yes
Part ID: ICC-013			
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 38780		Created By: Thomas Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 10/09/2017 01:10PM	Expires: 10/09/2018		
MFG Lot: TNB: 10/09/17		Verified By: Thomas Bosch	Usable: Yes		
Pipette ID: Not Provided		Verify Date:	Lab Lot: CLO4ISTDWRK		
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
23118	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.1 mL	02/27/2024

**STANDARD REPORT****Constituent****Stock Standard - CLO4ISTDSTK**

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 23118			Amount: 1 mL
MFG: Cambridge Isotope			Expires: 02/27/2024
MFG Lot: SDDG-013			Usable: Yes
Part ID: OLM-7310-S			Lab Lot: CLO4ISTDSTK
Created By: Thomas Bosch			
Create Date: 04/04/2014 03:04PM			
Verified By: Thomas Bosch			
Verify Date: 02/05/2009 12:02AM			
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.





Certificate of Analysis



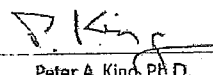
ISO Guide 34 Reference Material

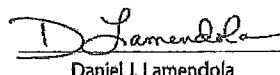
Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®, Inc.

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)

SRM: Ind. Std.

Lot: 216095148

Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Oct 4, 2016

Expiration: Oct 4, 2018

Sample Size: 100 mL

Components: 1

Storage Condition: Ambient ($>5^\circ\text{C}$)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO Guide 34 Scope of Accreditation: Yes



Signal Word: Warning

Component		SRM #	Prepared Concentration ($\mu\text{g/mL}$)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.2\%$. See reverse side for details.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a $0.2\ \mu\text{m}$ filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be $\pm 0.5\%$ of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:

ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O₄, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$
Labeled CAS Number: NA
Unlabeled CAS Number: 7601-89-0
MW*: 130.4
Chemical Formula: NaClO₄
Storage: Store at room temperature away from light and moisture.
Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* For isotopically labeled compounds, MW listed is for the fully enriched product.

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.M

['#'] ==> Run has not been reprocessed with Batch Review Method

['*'] ==> Run has been saved with batch file]

#	*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount	
--		-----	-----	---	-----	----	-----	-----	-----	
*		576090	CCV@25	Vial 71	1	Control	1	1.09561e6	11.895	24.21964
*		576091	LODV@1.	Vial 72	1	Control	2	4.52636e4	12.020	1.04682
*		576092	ICS@1.	Vial 73	1	Control	3	3.01866e4	11.983	1.26773
*		576093	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*		576094	LCS@5.	Vial 75	1	Control	5	1.67044e5	12.159	5.04313
*		1732091001	Vial 76	1	Sample	6	0.00000	0.000	0.00000	
*		1732091002	Vial 77	1	Sample	7	0.00000	0.000	0.00000	
*		1732091003	Vial 78	1	Sample	8	0.00000	0.000	0.00000	
*		1732091004	Vial 79	1	Sample	9	0.00000	0.000	0.00000	
*		1732091005	Vial 80	1	Sample	10	0.00000	0.000	0.00000	
*		1732091006	Vial 81	1	Sample	11	0.00000	0.000	0.00000	
*		1732091007	Vial 82	1	Sample	12	0.00000	0.000	0.00000	
*		1732091008	Vial 83	1	Sample	13	0.00000	0.000	0.00000	
*		1732091009	Vial 84	1	Sample	14	0.00000	0.000	0.00000	
*		1732091010	Vial 85	1	Sample	15	0.00000	0.000	0.00000	
*		576097	CCV@25	Vial 71	1	Control	16	9.03454e5	12.094	22.43960
*		576098	LODV@1.	Vial 72	1	Control	17	3.78661e4	12.223	9.36275e-1
*		1732092001	Vial 86	1	Sample	18	0.00000	0.000	0.00000	
*		1732092002	Vial 87	1	Sample	19	5.55201e8	8.782	4376.11130	
*		1732092003	Vial 88	1	Sample	20	0.00000	0.000	0.00000	
*		1732412001	Vial 89	1	Sample	21	1.38593e5	12.015	4.38318	
*		1732412002	Vial 90	1	Sample	22	0.00000	0.000	0.00000	
*		1732412003	Vial 91	1	Sample	23	0.00000	0.000	0.00000	
*		1732412004	Vial 92	1	Sample	24	0.00000	0.000	0.00000	
*		1732412005	Vial 93	1	Sample	25	7.90446e4	11.822	2.49899	
*		1732412006	Vial 94	1	Sample	26	0.00000	0.000	0.00000	
*		1732092002	1K	Vial 97	1	Sample	27	8.04721e5	12.411	2.07685e4
*		576095	320911S	Vial 95	1	Sample	28	1.30496e5	11.819	4.81777
*		576096	320911D	Vial 96	1	Sample	29	1.61297e5	11.833	4.71042
*		576099	CCV@25	Vial 71	1	Control	30	9.48245e5	12.343	26.16232
*		576100	LODV@1.	Vial 72	1	Control	31	4.73844e4	12.263	1.15050

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
--		-----	-----	---	-----	----	-----	-----	-----	
*		576090	CCV@25	Vial 71	1	Control	1	3.42851e5	11.914	23.98843
*		576091	LODV@1.	Vial 72	1	Control	2	1.74133e4	12.035	1.01881
*		576092	ICS@1.	Vial 73	1	Control	3	9934.82910	11.972	1.06940
*		576093	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*		576094	LCS@5.	Vial 75	1	Control	5	5.79647e4	12.180	5.23659
*		1732091001		Vial 76	1	Sample	6	0.00000	0.000	0.00000
*		1732091002		Vial 77	1	Sample	7	0.00000	0.000	0.00000
*		1732091003		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*		1732091004		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*		1732091005		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*		1732091006		Vial 81	1	Sample	11	0.00000	0.000	0.00000
*		1732091007		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*		1732091008		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*		1732091009		Vial 84	1	Sample	14	0.00000	0.000	0.00000
*		1732091010		Vial 85	1	Sample	15	0.00000	0.000	0.00000
*		576097	CCV@25	Vial 71	1	Control	16	2.98426e5	12.110	23.31381
*		576098	LODV@1.	Vial 72	1	Control	17	1.45445e4	12.254	8.84665e-1
*		1732092001		Vial 86	1	Sample	18	0.00000	0.000	0.00000
*		1732092002		Vial 87	1	Sample	19	1.99226e8	8.800	5258.03572
*		1732092003		Vial 88	1	Sample	20	0.00000	0.000	0.00000
*		1732412001		Vial 89	1	Sample	21	4.49391e4	12.041	4.21409
*		1732412002		Vial 90	1	Sample	22	0.00000	0.000	0.00000
*		1732412003		Vial 91	1	Sample	23	0.00000	0.000	0.00000
*		1732412004		Vial 92	1	Sample	24	0.00000	0.000	0.00000
*		1732412005		Vial 93	1	Sample	25	3.03860e4	11.831	2.75735
*		1732412006		Vial 94	1	Sample	26	0.00000	0.000	0.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
* 1732092002	1K	Vial 97	1	Sample	27	2.56281e5	12.425	2.08101e4
* 576095	320911S	Vial 95	1	Sample	28	4.65502e4	11.839	5.13367
* 576096	320911D	Vial 96	1	Sample	29	5.36155e4	11.841	4.66480
* 576099	CCV@25	Vial 71	1	Control	30	3.04731e5	12.357	26.61768
* 576100	LODV@1.	Vial 72	1	Control	31	1.71063e4	12.305	1.06038

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount
* 576090	CCV@25	Vial 71	1	Control	1	1.86094e5	11.914	5.00000
* 576091	LODV@1.	Vial 72	1	Control	2	2.04319e5	12.035	5.00000
* 576092	ICS@1.	Vial 73	1	Control	3	1.11922e5	12.011	5.00000
* 576093	LMB	Vial 74	1	Control	4	2.20163e5	12.199	5.00000
* 576094	LCS@5.	Vial 75	1	Control	5	1.50430e5	12.185	5.00000
* 1732091001		Vial 76	1	Sample	6	1.40767e5	11.672	5.00000
* 1732091002		Vial 77	1	Sample	7	1.11879e5	11.665	5.00000
* 1732091003		Vial 78	1	Sample	8	1.45710e5	11.726	5.00000
* 1732091004		Vial 79	1	Sample	9	1.53536e5	11.744	5.00000
* 1732091005		Vial 80	1	Sample	10	1.64241e5	11.947	5.00000
* 1732091006		Vial 81	1	Sample	11	1.50094e5	11.680	5.00000
* 1732091007		Vial 82	1	Sample	12	1.58992e5	11.568	5.00000
* 1732091008		Vial 83	1	Sample	13	1.49810e5	11.799	5.00000
* 1732091009		Vial 84	1	Sample	14	1.34249e5	11.756	5.00000
* 1732091010		Vial 85	1	Sample	15	1.34276e5	11.830	5.00000
* 576097	CCV@25	Vial 71	1	Control	16	1.67049e5	12.114	5.00000
* 576098	LODV@1.	Vial 72	1	Control	17	1.91758e5	12.255	5.00000
* 1732092001		Vial 86	1	Sample	18	1.42420e5	11.750	5.00000
* 1732092002		Vial 87	1	Sample	19	2.41561e4	8.801	5.00000
* 1732092003		Vial 88	1	Sample	20	9.48656e4	12.095	5.00000
* 1732412001		Vial 89	1	Sample	21	1.44201e5	12.034	5.00000
* 1732412002		Vial 90	1	Sample	22	1.40770e5	11.853	5.00000
* 1732412003		Vial 91	1	Sample	23	1.55137e5	12.177	5.00000
* 1732412004		Vial 92	1	Sample	24	1.56769e5	11.908	5.00000
* 1732412005		Vial 93	1	Sample	25	1.46300e5	11.849	5.00000
* 1732412006		Vial 94	1	Sample	26	1.64919e5	11.684	5.00000
* 1732092002	1K	Vial 97	1	Sample	27	1.62071e5	12.431	5000.00000
* 576095	320911S	Vial 95	1	Sample	28	1.23187e5	11.840	5.00000
* 576096	320911D	Vial 96	1	Sample	29	1.55837e5	11.851	5.00000
* 576099	CCV@25	Vial 71	1	Control	30	1.47735e5	12.359	5.00000
* 576100	LODV@1.	Vial 72	1	Control	31	1.94094e5	12.290	5.00000

*** End of Report ***

Sequence Table:

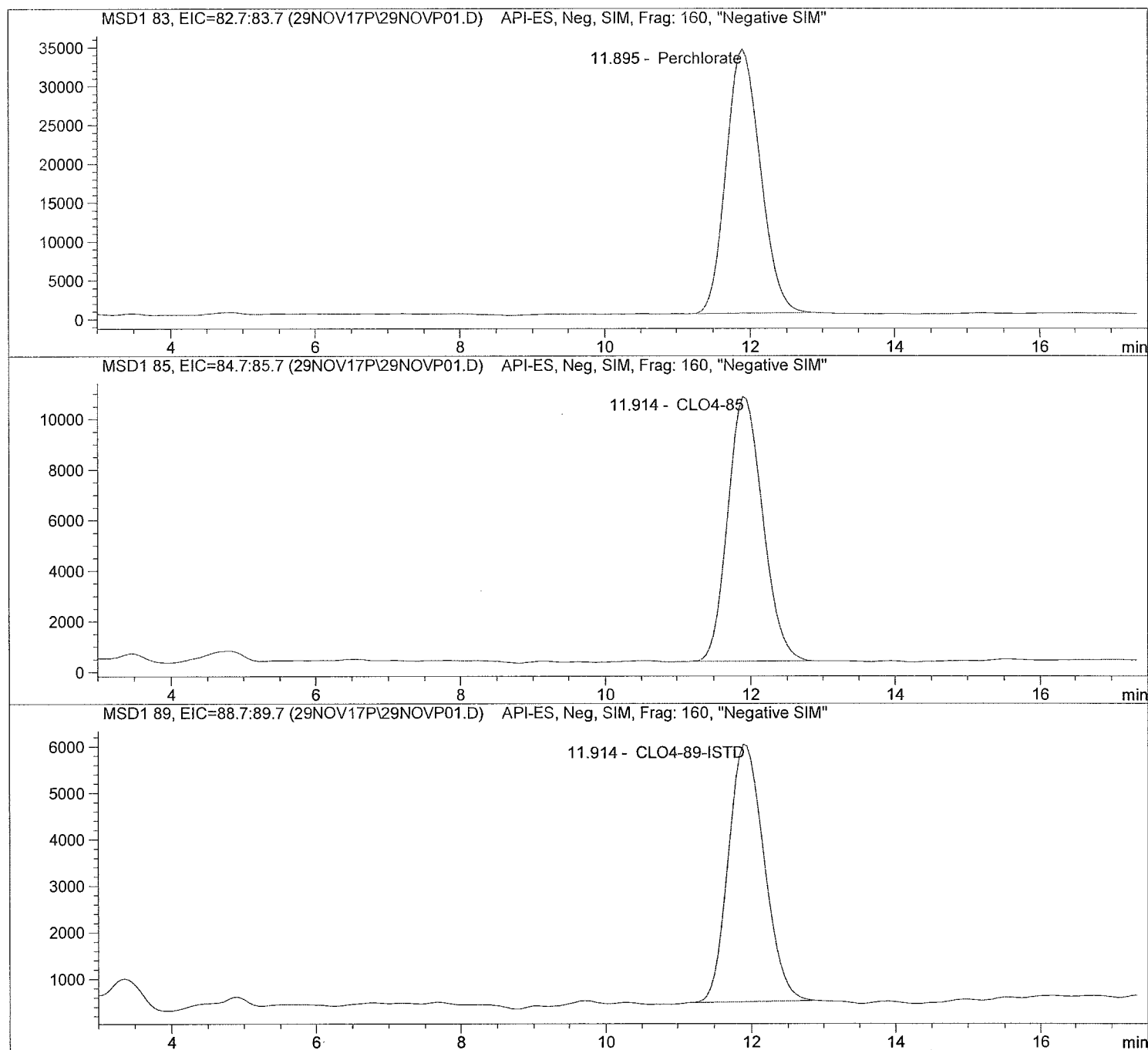
Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	576090	CCV@25	CLO4-DOD	1	Ctrl Samp	
2	Vial 72	576091	LODV@1.	CLO4-DOD	1	Ctrl Samp	
3	Vial 73	576092	ICS@1.	CLO4-DOD	1	Ctrl Samp	
4	Vial 74	576093	LMB	CLO4-DOD	1	Ctrl Samp	
5	Vial 75	576094	LCS@5.	CLO4-DOD	1	Ctrl Samp	
6	Vial 76	1732091001		CLO4-DOD	1	Sample	
7	Vial 77	1732091002		CLO4-DOD	1	Sample	
8	Vial 78	1732091003		CLO4-DOD	1	Sample	
9	Vial 79	1732091004		CLO4-DOD	1	Sample	
10	Vial 80	1732091005		CLO4-DOD	1	Sample	
11	Vial 81	1732091006		CLO4-DOD	1	Sample	
12	Vial 82	1732091007		CLO4-DOD	1	Sample	
13	Vial 83	1732091008		CLO4-DOD	1	Sample	
14	Vial 84	1732091009		CLO4-DOD	1	Sample	
15	Vial 85	1732091010		CLO4-DOD	1	Sample	
16	Vial 71	576097	CCV@25	CLO4-DOD	1	Ctrl Samp	
17	Vial 72	576098	LODV@1.	CLO4-DOD	1	Ctrl Samp	
18	Vial 86	1732092001		CLO4-DOD	1	Sample	
19	Vial 87	1732092002		CLO4-DOD	1	Sample	
20	Vial 88	1732092003		CLO4-DOD	1	Sample	
21	Vial 89	1732412001		CLO4-DOD	1	Sample	
22	Vial 90	1732412002		CLO4-DOD	1	Sample	
23	Vial 91	1732412003		CLO4-DOD	1	Sample	
24	Vial 92	1732412004		CLO4-DOD	1	Sample	
25	Vial 93	1732412005		CLO4-DOD	1	Sample	
26	Vial 94	1732412006		CLO4-DOD	1	Sample	
27	Vial 97	1732092002	1K	CLO4-DOD	1	Sample	
28	Vial 95	576095	320911S	CLO4-DOD	1	Sample	
29	Vial 96	576096	320911D	CLO4-DOD	1	Sample	
30	Vial 71	576099	CCV@25	CLO4-DOD	1	Ctrl Samp	
31	Vial 72	576100	LODV@1.	CLO4-DOD	1	Ctrl Samp	

Injection Date: 11/29/2017 08:26:28 Seq Line: 1
Sample Name: 576090 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP01.D

Sample Name: 576090 CCV@25

```
=====
Injection Date: 11/29/2017 08:26:28      Seq Line: 1
Sample Name: 576090 CCV@25              Location: Vial 71
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.895	PBA	1095606.8	24.2196	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.914	PBA	342851.1	23.9884	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.914	BBA	186093.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

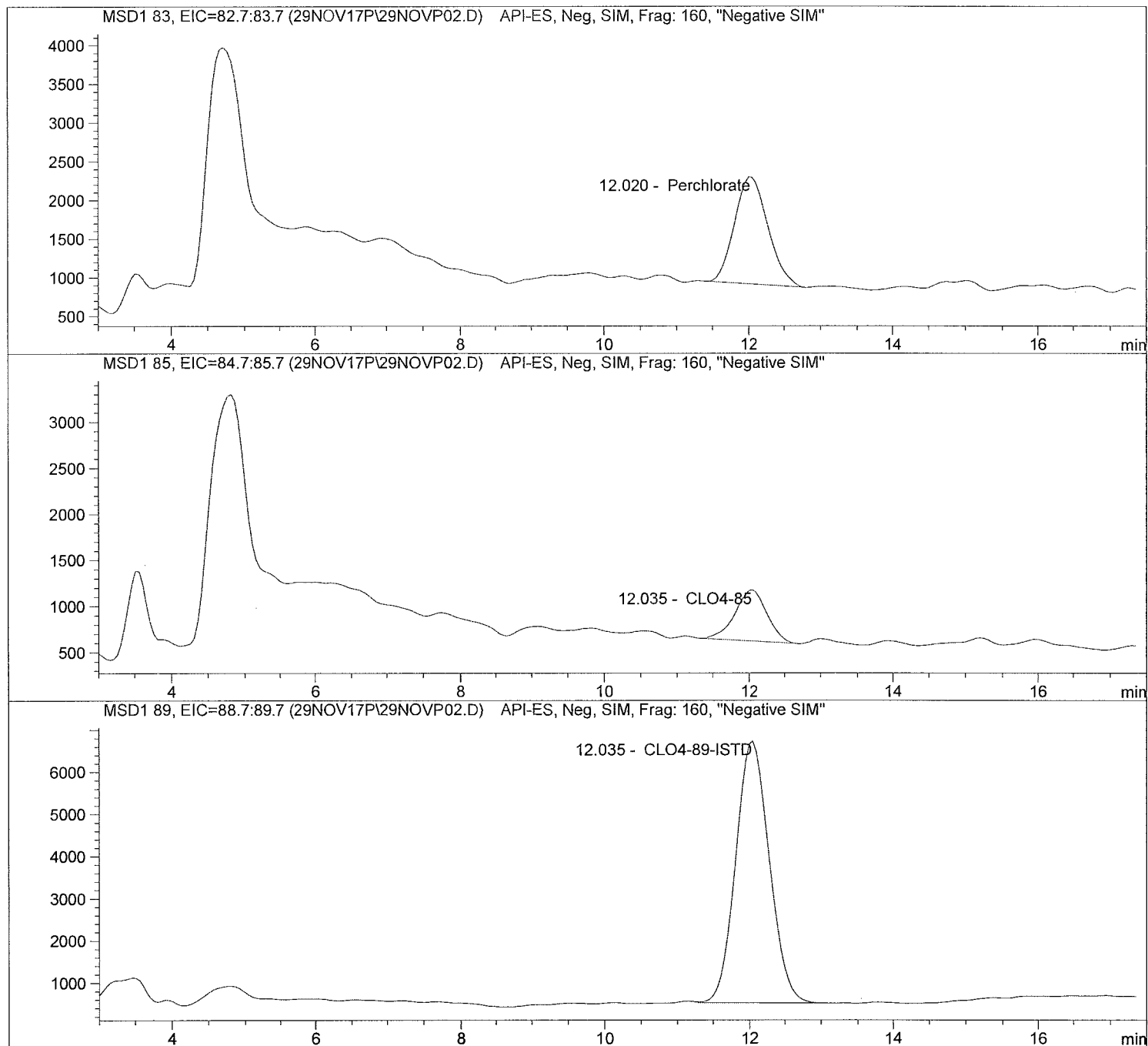
Injection Date:	11/29/2017 08:47:05	Seq Line:	2
Sample Name:	576091 LODV@1.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP02.D

Sample Name: 576091 LODV@1.

```
=====
Injection Date: 11/29/2017 08:47:05      Seq Line: 2
Sample Name: 576091 LODV@1.              Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.020	PBA	45263.6	1.0468	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.035	PBA	17413.3	1.0188	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

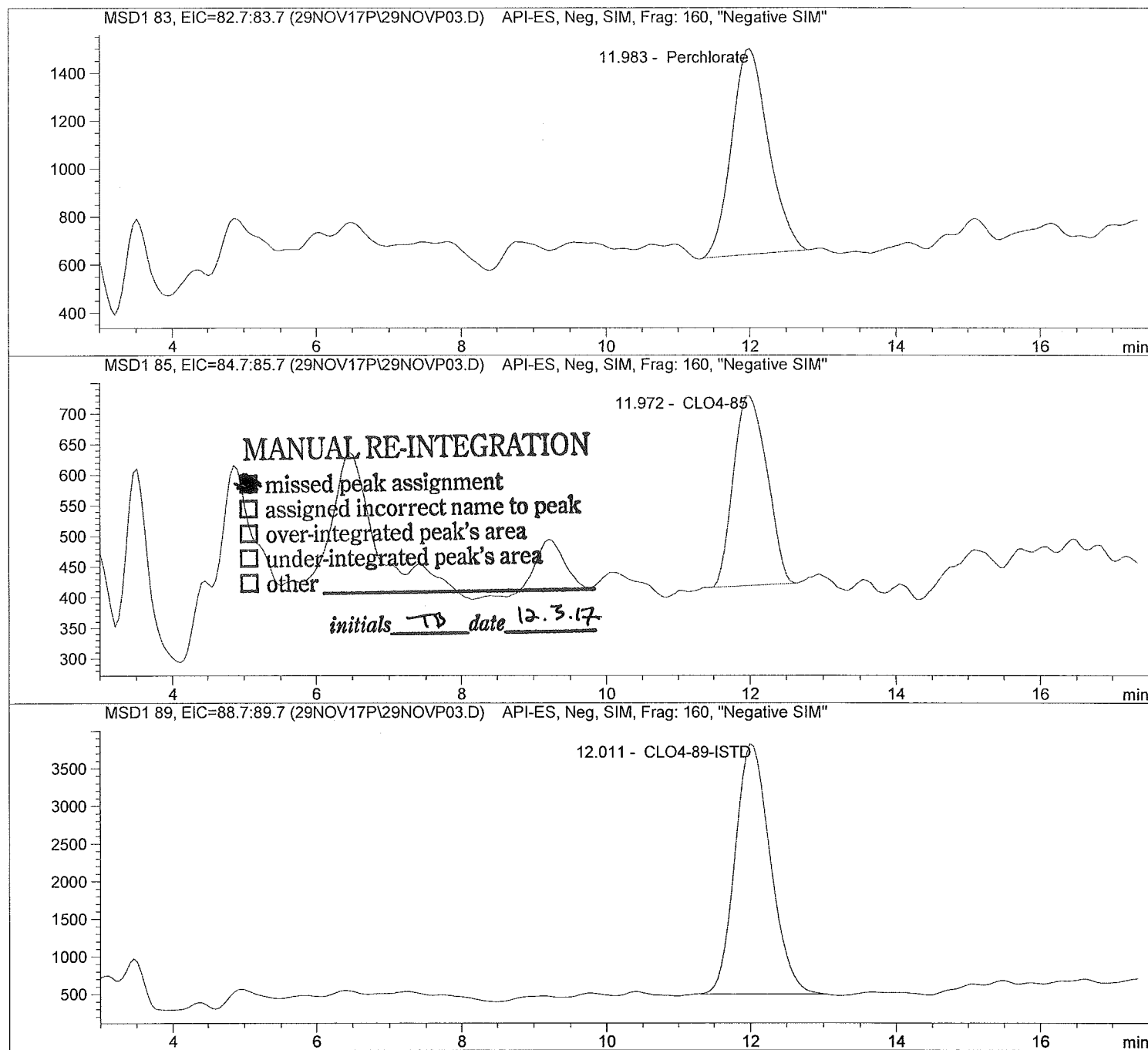
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.035	BBA	204318.6	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Injection Date: 11/29/2017 09:06:18 Seq Line: 3
Sample Name: 576092 ICS@1. Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP03.D

Sample Name: 576092 ICS01.

```

=====
Injection Date: 11/29/2017 09:06:18      Seq Line: 3
Sample Name: 576092 ICS01.              Location: Vial 73
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====

```

```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.983	PBA	30186.6	1.2677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.972	MM	9934.8	1.0694	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.011	BBA	111922.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

=====

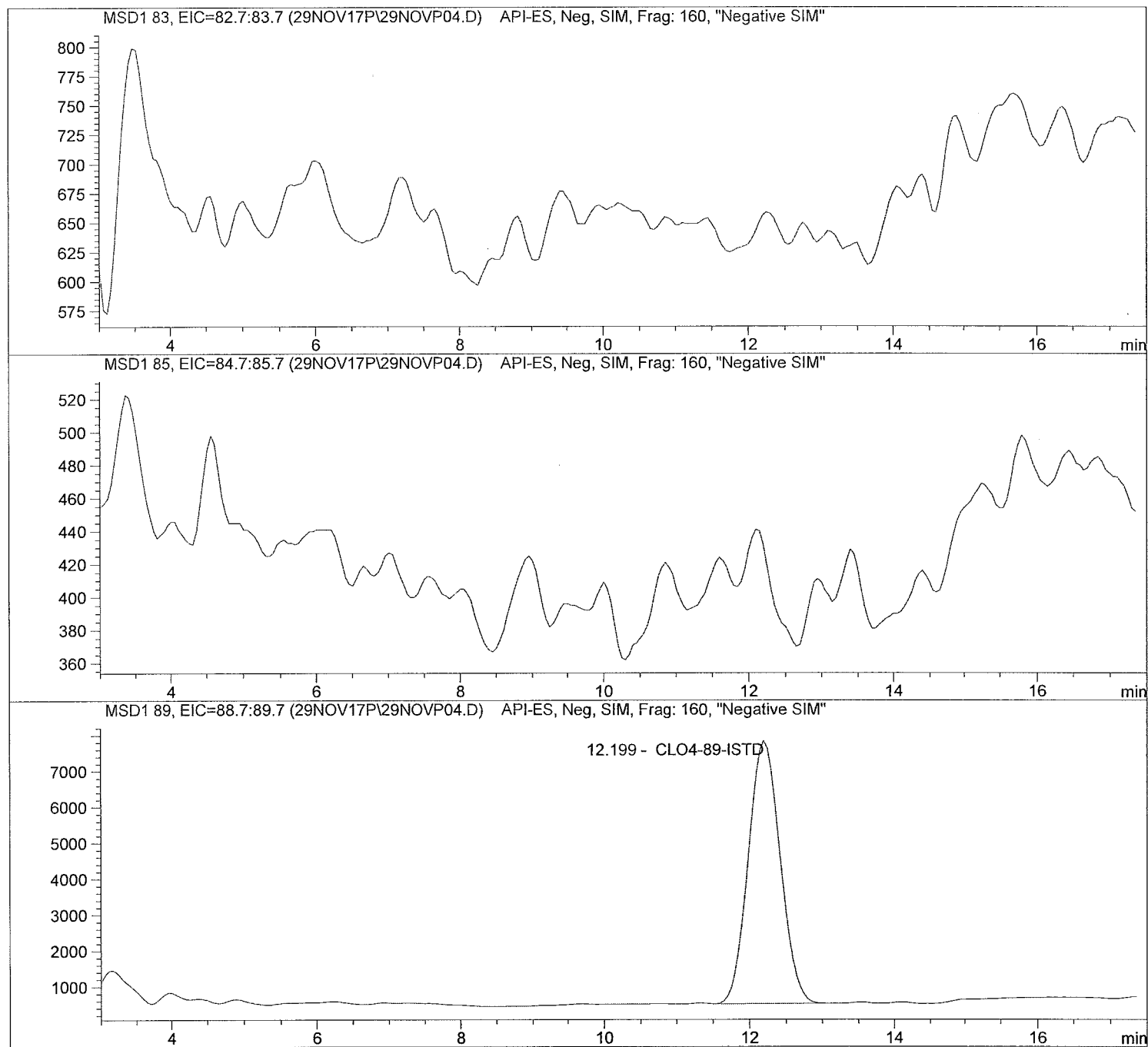
Injection Date:	11/29/2017 09:25:30	Seq Line:	4
Sample Name:	576093 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP04.D

Sample Name: 576093 LMB

```
=====
Injection Date: 11/29/2017 09:25:30      Seq Line: 4
Sample Name: 576093 LMB                  Location: Vial 74
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

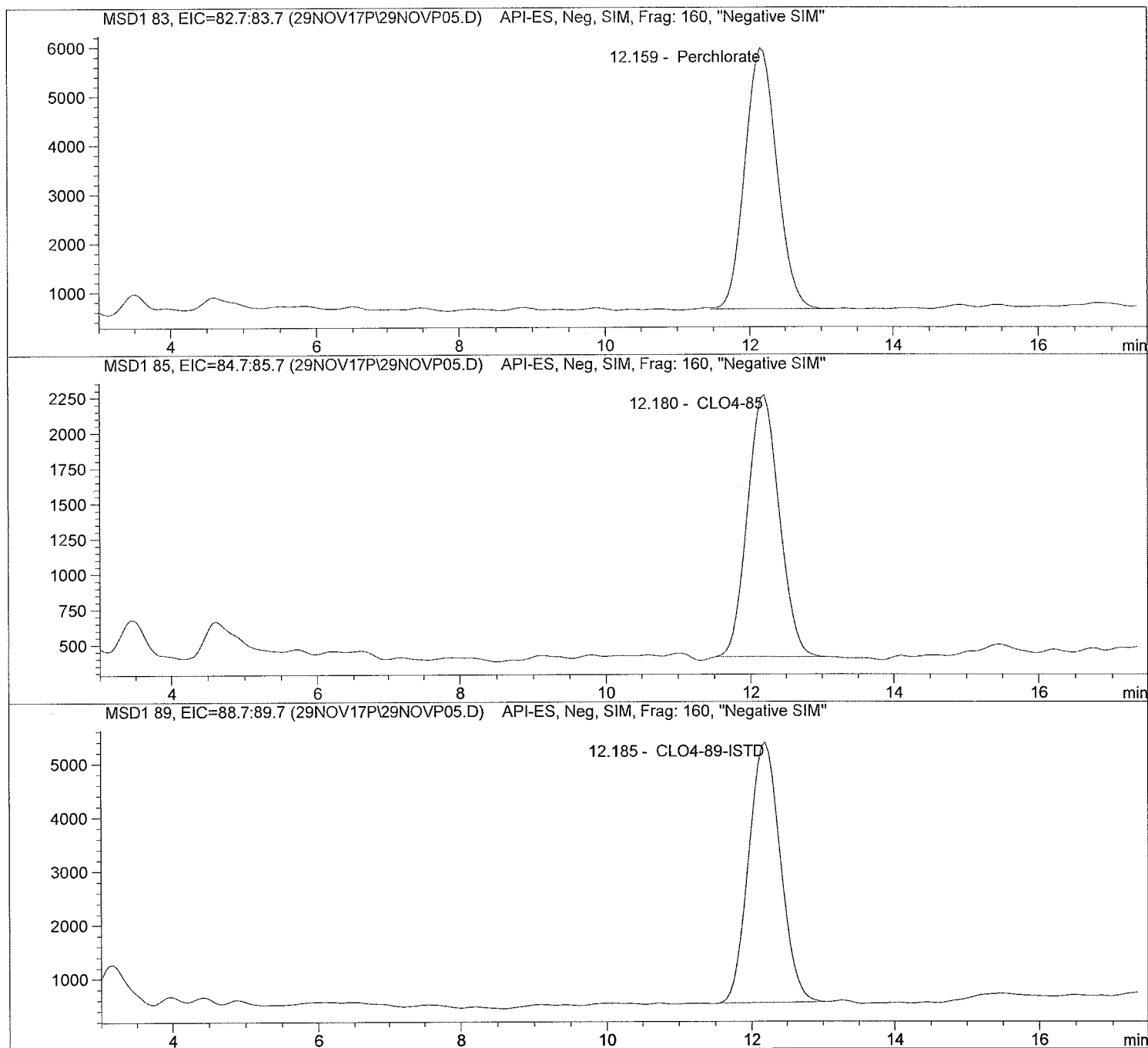
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.199	PBA	220162.6	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Injection Date:	11/29/2017 09:44:41	Seq Line:	5
Sample Name:	576094 LCS05.	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP05.D

Sample Name: 576094 LCS05.

```
=====
Injection Date: 11/29/2017 09:44:41      Seq Line: 5
Sample Name: 576094 LCS05.              Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.159	BBA	167044.1	5.0431	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.180	PBA	57964.7	5.2366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.185	PBA	150429.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

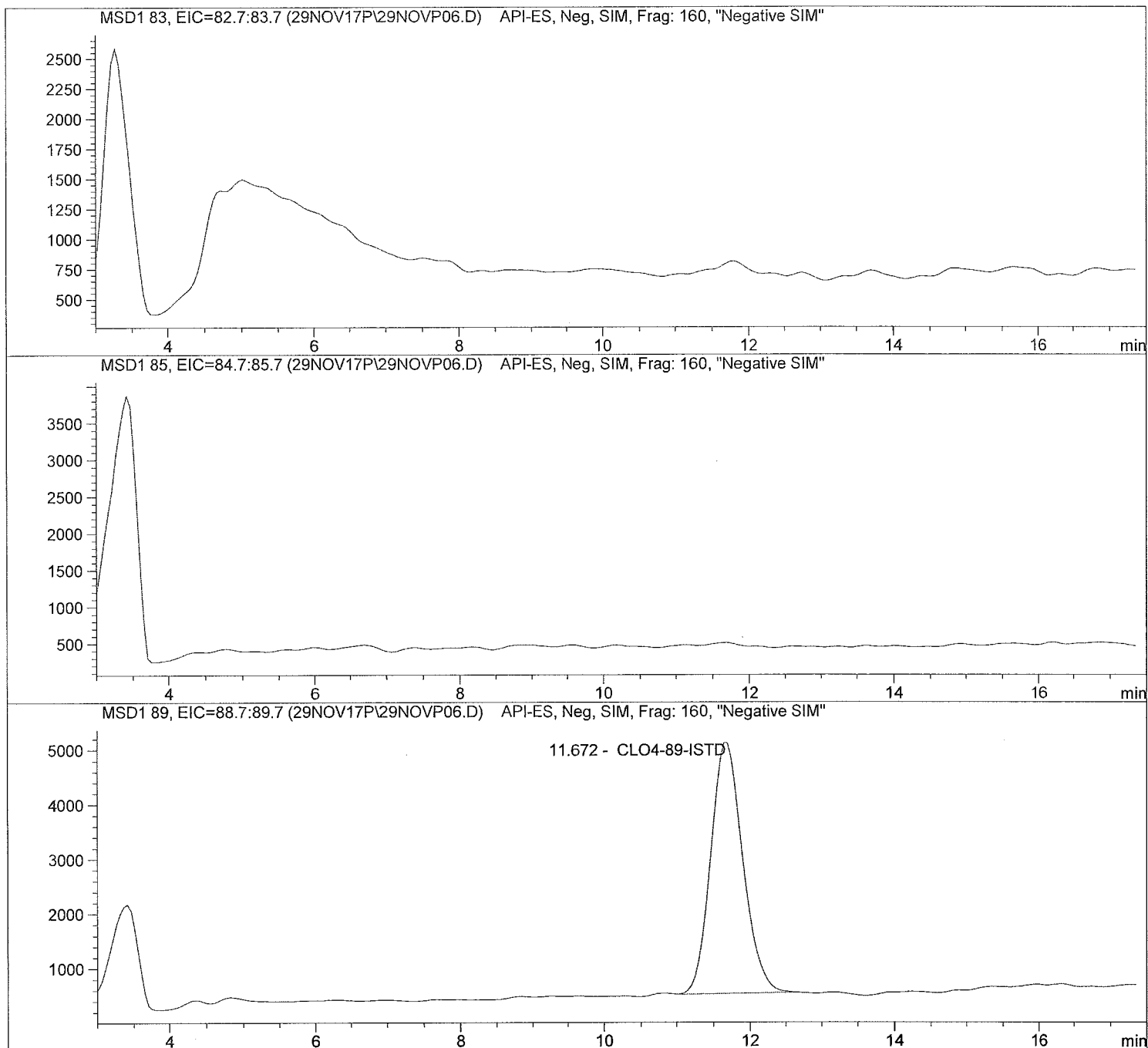
Injection Date:	11/29/2017 10:03:52	Seq Line:	6
Sample Name:	1732091001	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP06.D

Sample Name: 1732091001

```
=====
Injection Date: 11/29/2017 10:03:52      Seq Line: 6
Sample Name: 1732091001                  Location: Vial 76
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.672	BBA	140766.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

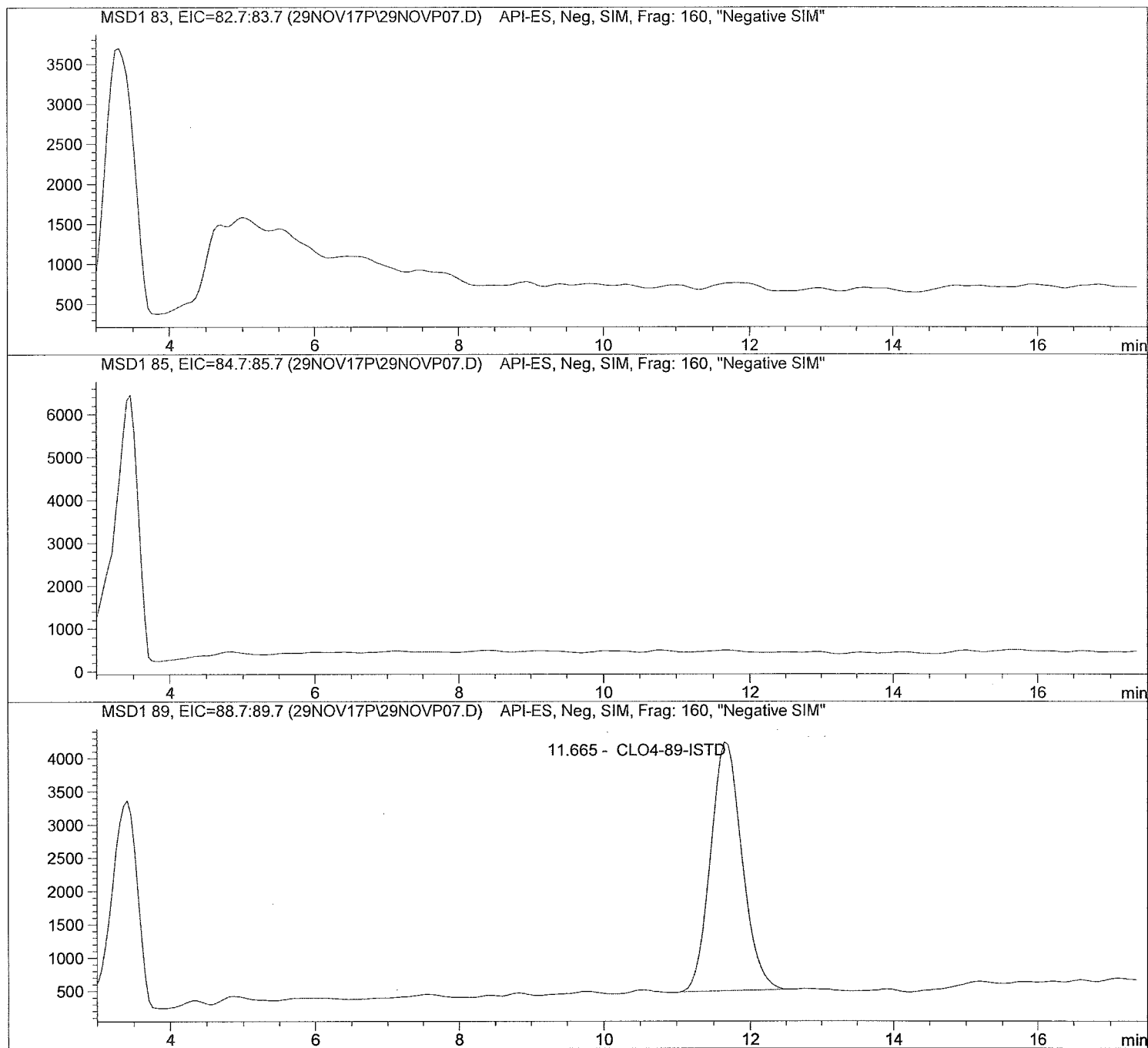
Injection Date:	11/29/2017 10:23:02	Seq Line:	7
Sample Name:	1732091002	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP07.D

Sample Name: 1732091002

```

=====
Injection Date: 11/29/2017 10:23:02      Seq Line: 7
Sample Name: 1732091002                  Location: Vial 77
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====

```

```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.665	PBA	111879.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

=====

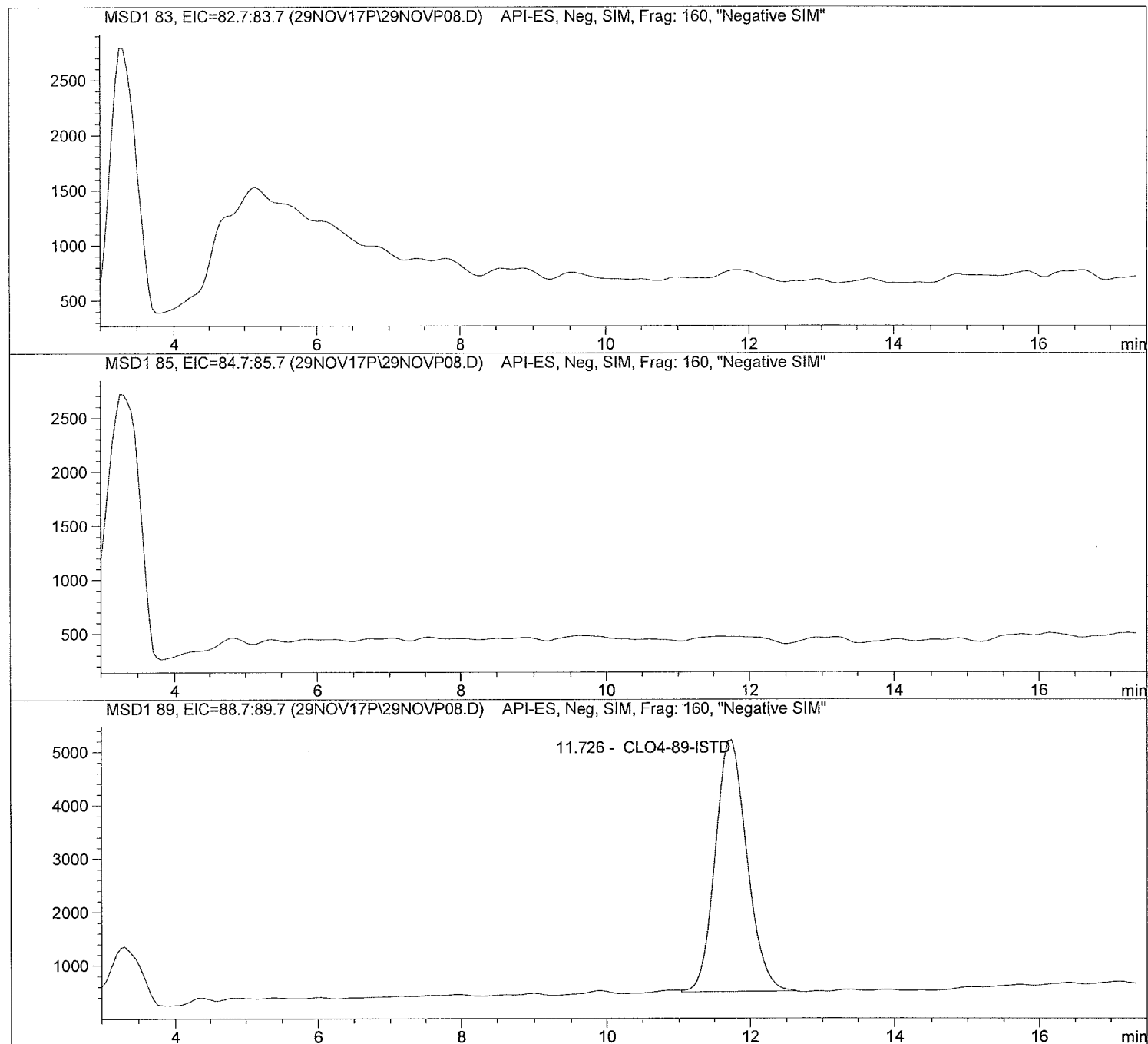
Injection Date:	11/29/2017 10:42:11	Seq Line:	8
Sample Name:	1732091003	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP08.D Sample Name: 1732091003

```
=====
Injection Date: 11/29/2017 10:42:11      Seq Line:      8
Sample Name:    1732091003                Location:      Vial 78
Acq Operator:   TNB                       Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.726	BBA	145710.3	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

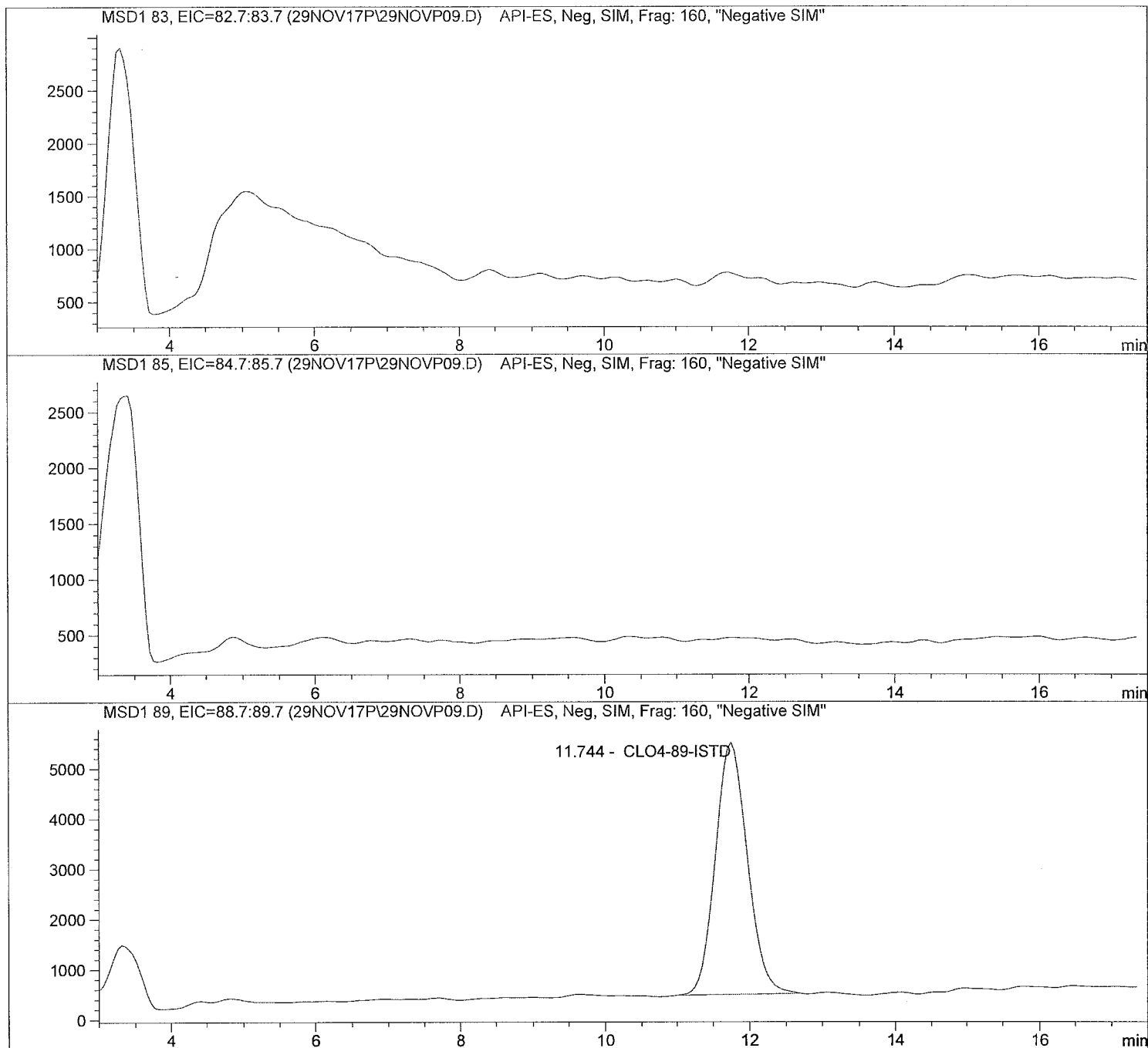
Injection Date:	11/29/2017 11:01:20	Seq Line:	9
Sample Name:	1732091004	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP09.D

Sample Name: 1732091004

```
=====
Injection Date: 11/29/2017 11:01:20      Seq Line: 9
Sample Name: 1732091004                  Location: Vial 79
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.744	BBA	153536.3	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

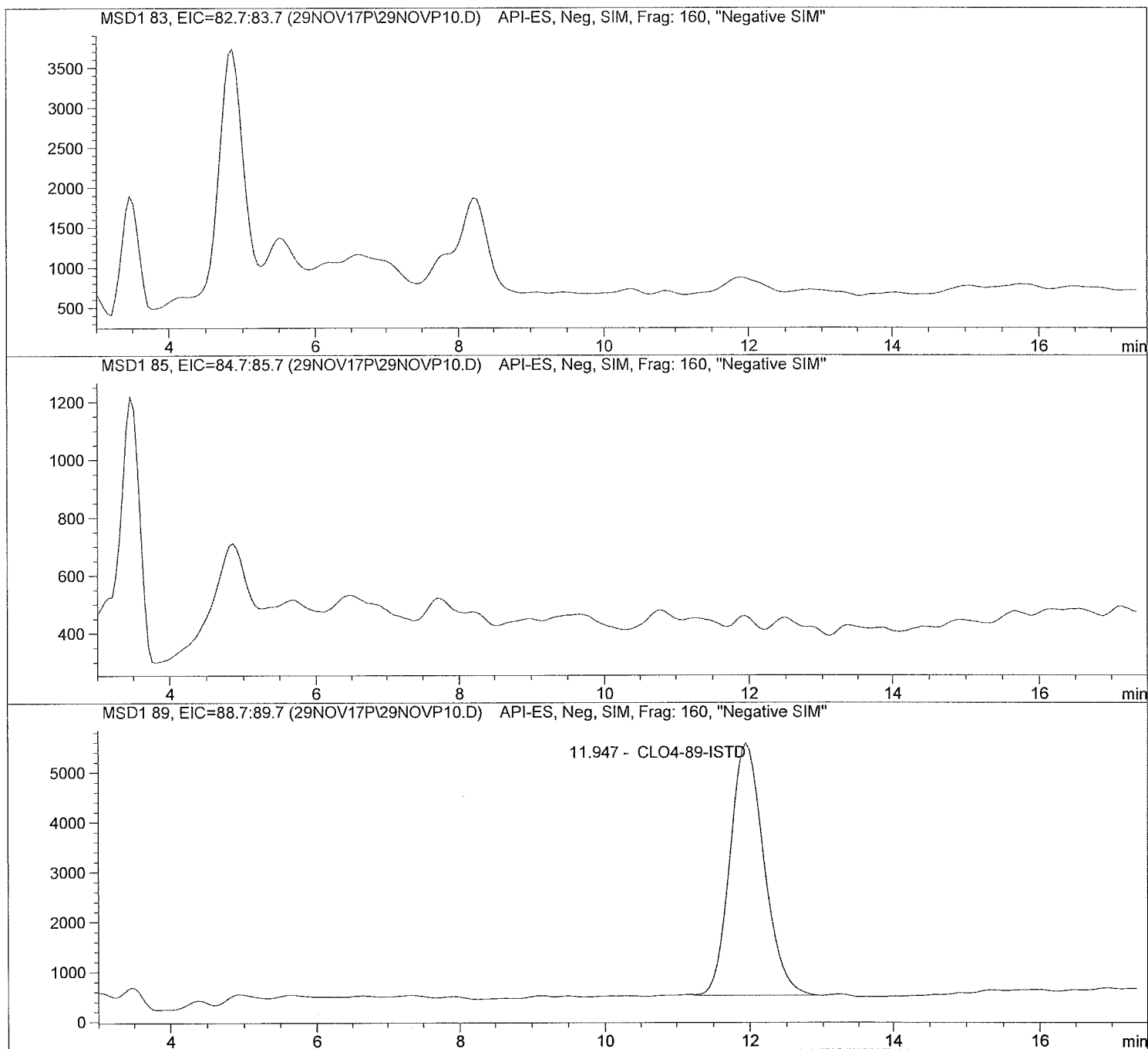
Injection Date:	11/29/2017 11:20:31	Seq Line:	10
Sample Name:	1732091005	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP10.D

Sample Name: 1732091005

```
=====
Injection Date: 11/29/2017 11:20:31      Seq Line: 10
Sample Name: 1732091005                  Location: Vial 80
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

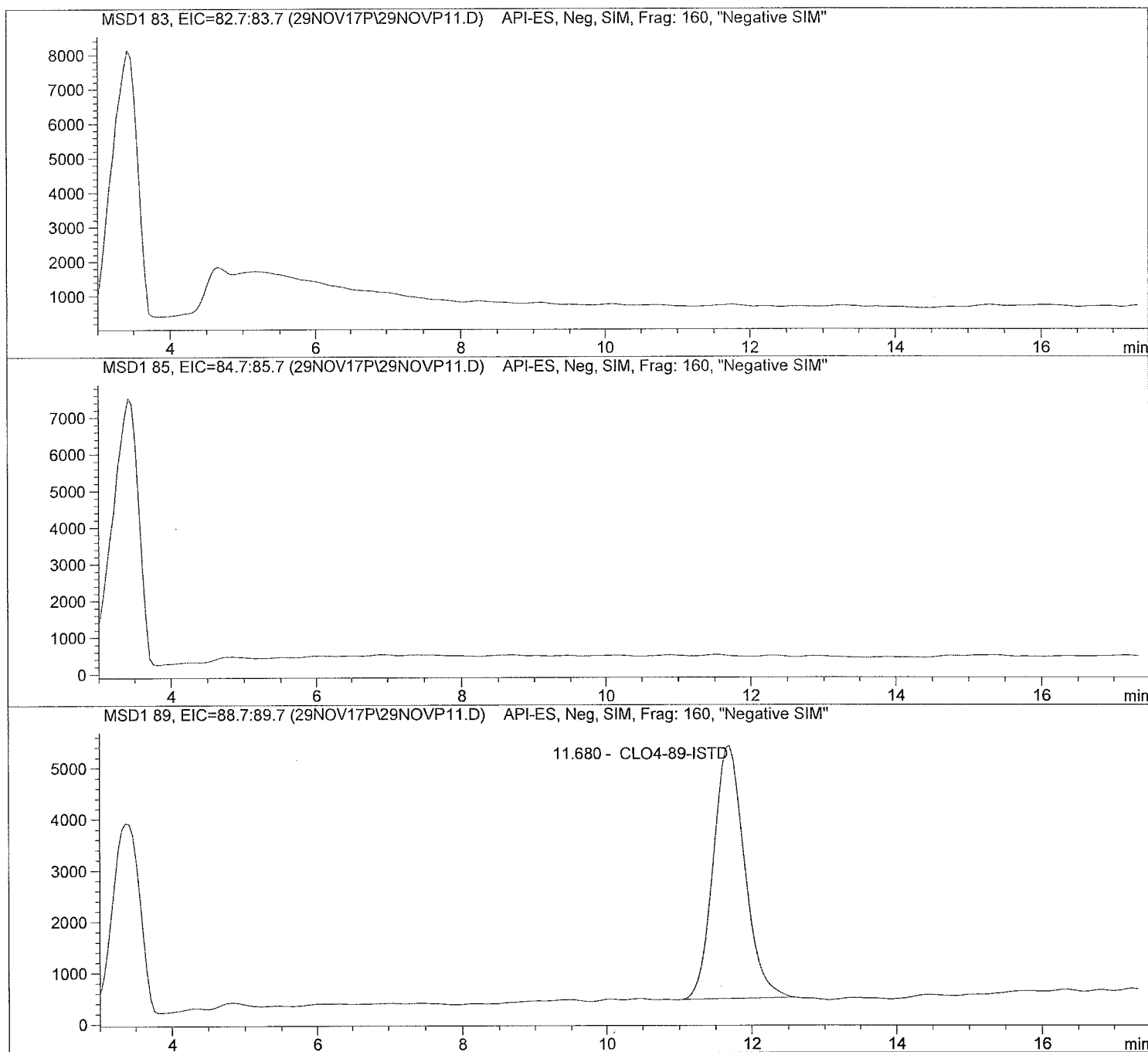
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.947	BBA	164241.4	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

```
=====
Injection Date: 11/29/2017 11:39:43      Seq Line: 11
Sample Name: 1732091006                  Location: Vial 81
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP11.D

Sample Name: 1732091006

```
=====
Injection Date: 11/29/2017 11:39:43      Seq Line: 11
Sample Name: 1732091006                  Location: Vial 81
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.680	PBA	150093.5	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

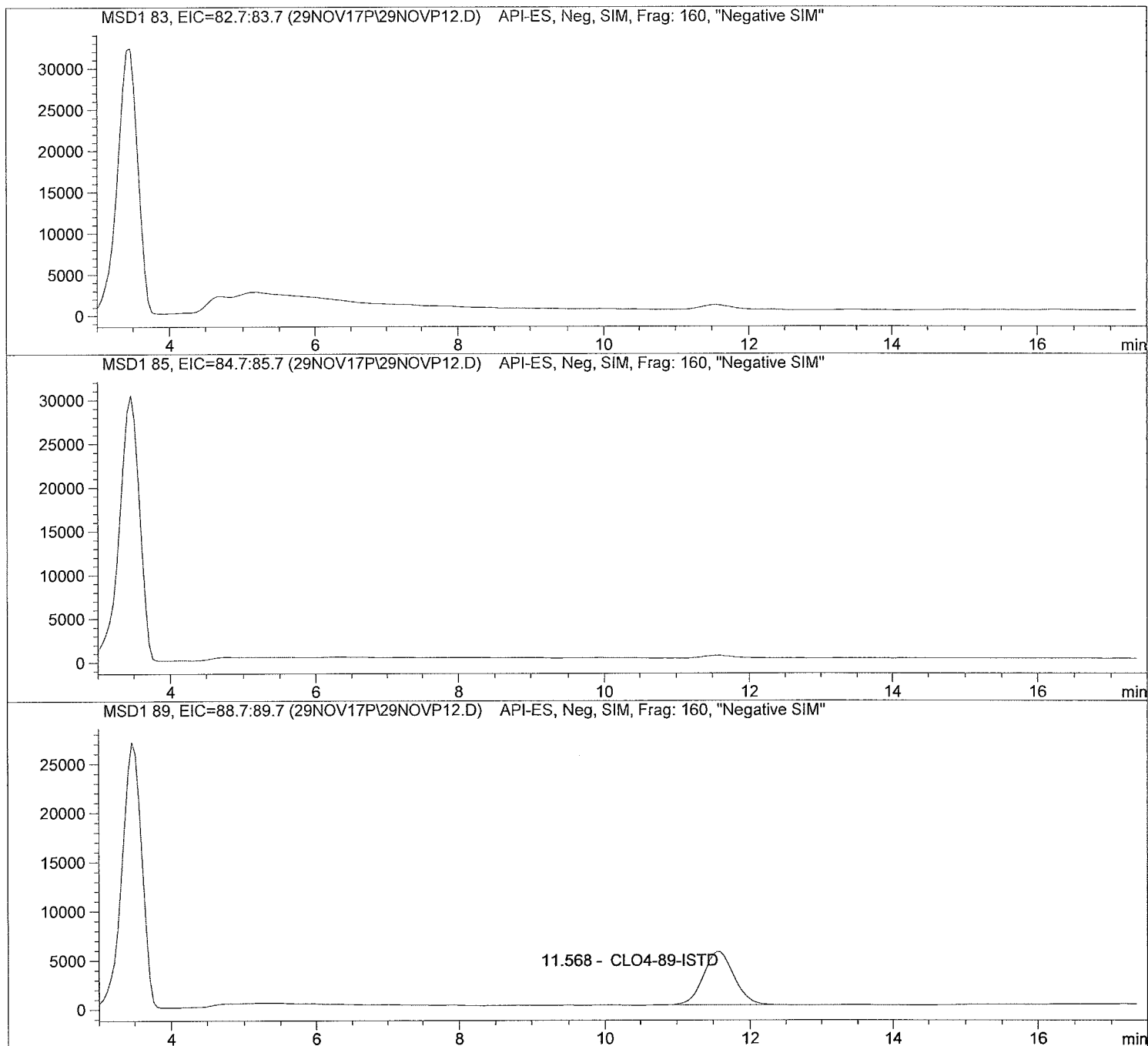
Injection Date:	11/29/2017 11:58:51	Seq Line:	12
Sample Name:	1732091007	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP12.D

Sample Name: 1732091007

```

=====
Injection Date: 11/29/2017 11:58:51      Seq Line:      12
Sample Name:    1732091007              Location:      Vial 82
Acq Operator:   TNB                     Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.568	BBA	158992.2	5.0000	CLO4-89-ISTD

```

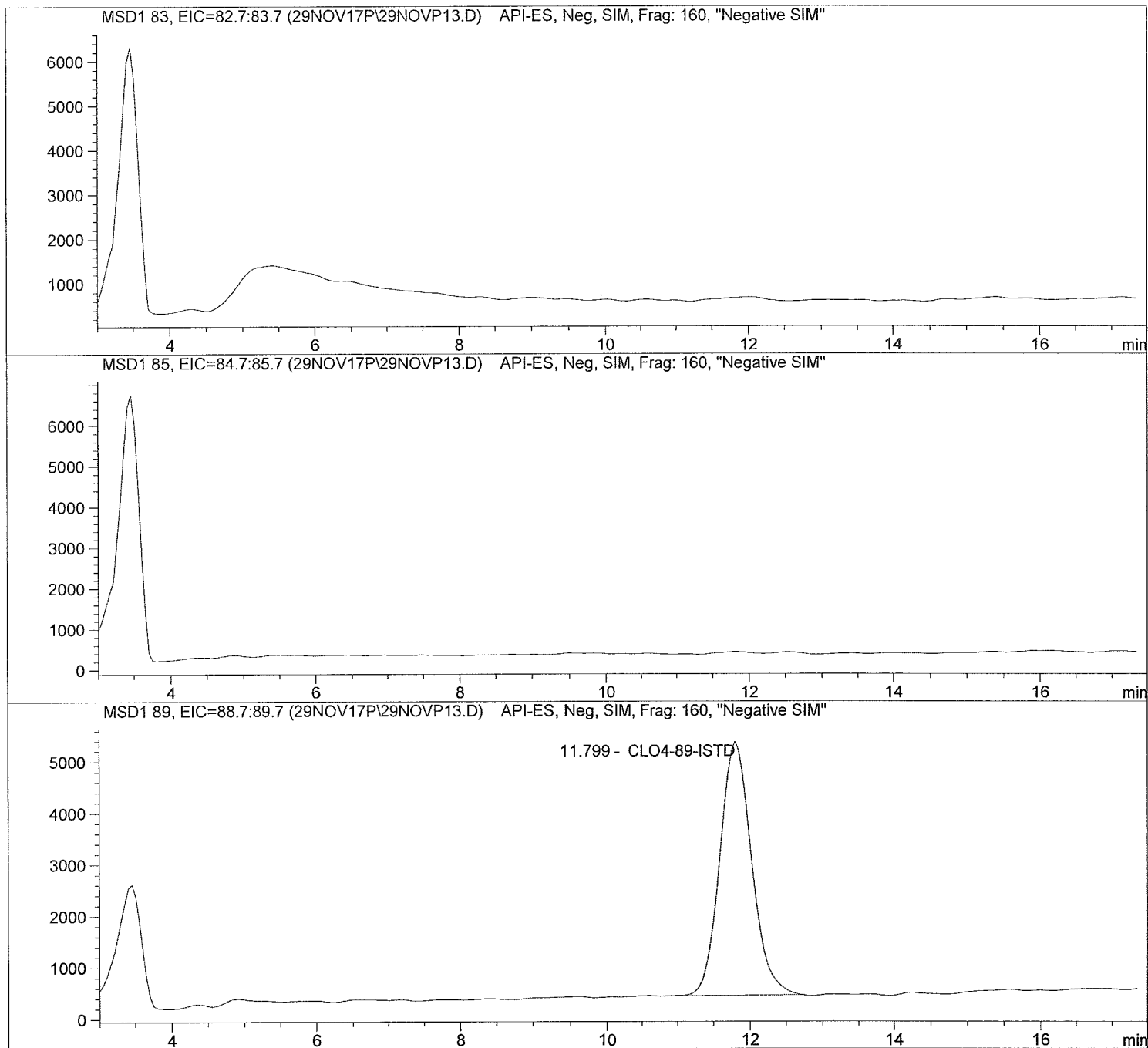
=====
*** End of Report ***

```

Injection Date:	11/29/2017 12:17:58	Seq Line:	13
Sample Name:	1732091008	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP13.D

Sample Name: 1732091008

```
=====
Injection Date: 11/29/2017 12:17:58      Seq Line: 13
Sample Name: 1732091008                  Location: Vial 83
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.799	BBA	149810.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

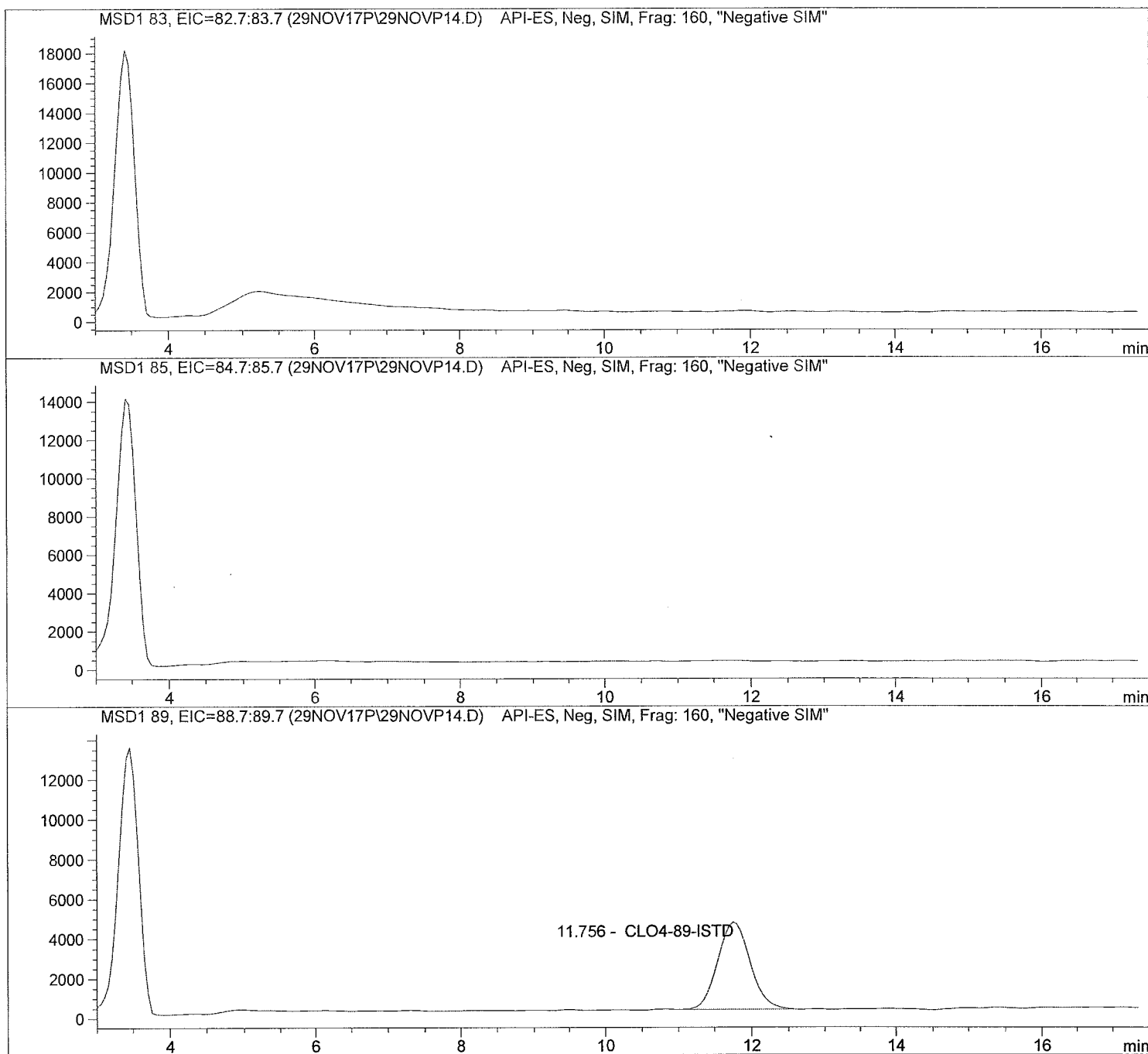
Injection Date:	11/29/2017 12:37:08	Seq Line:	14
Sample Name:	1732091009	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP14.D

Sample Name: 1732091009

```

=====
Injection Date: 11/29/2017 12:37:08      Seq Line: 14
Sample Name: 1732091009                  Location: Vial 84
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====

```

```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.756	BBA	134248.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

=====

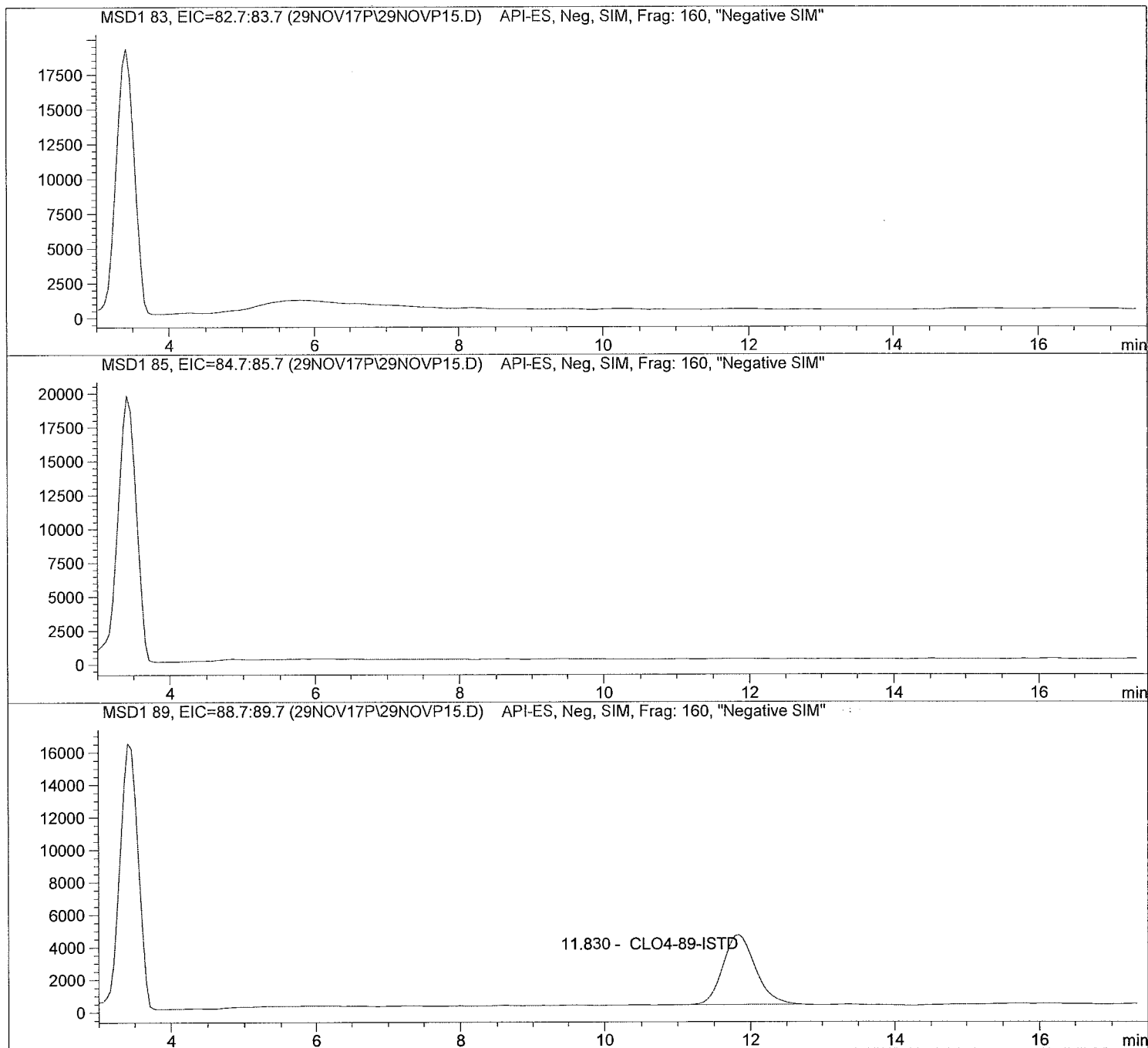
Injection Date:	11/29/2017 12:56:18	Seq Line:	15
Sample Name:	1732091010	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP15.D

Sample Name: 1732091010

```
=====
Injection Date: 11/29/2017 12:56:18      Seq Line: 15
Sample Name: 1732091010                  Location: Vial 85
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.830	BBA	134275.5	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

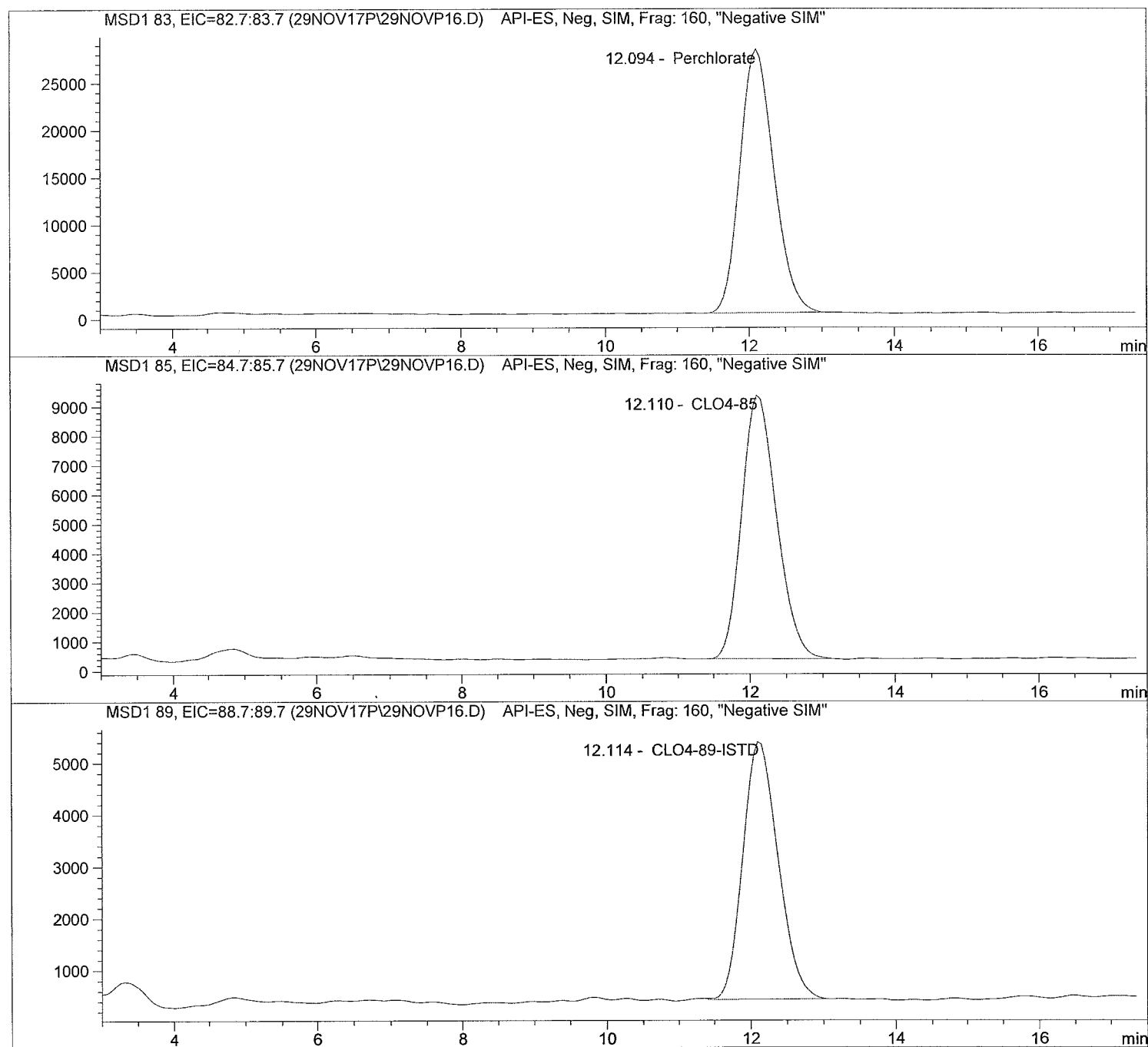
Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP16.D

Sample Name: 576097 CCV@25

Injection Date:	11/29/2017 13:15:32	Seq Line:	16
Sample Name:	576097 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP16.D

Sample Name: 576097 CCV@25

```
=====
Injection Date: 11/29/2017 13:15:32      Seq Line: 16
Sample Name: 576097 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017, 08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.094	PBA	903453.8	22.4396	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.110	PBA	298425.6	23.3138	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.114	BBA	167048.6	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

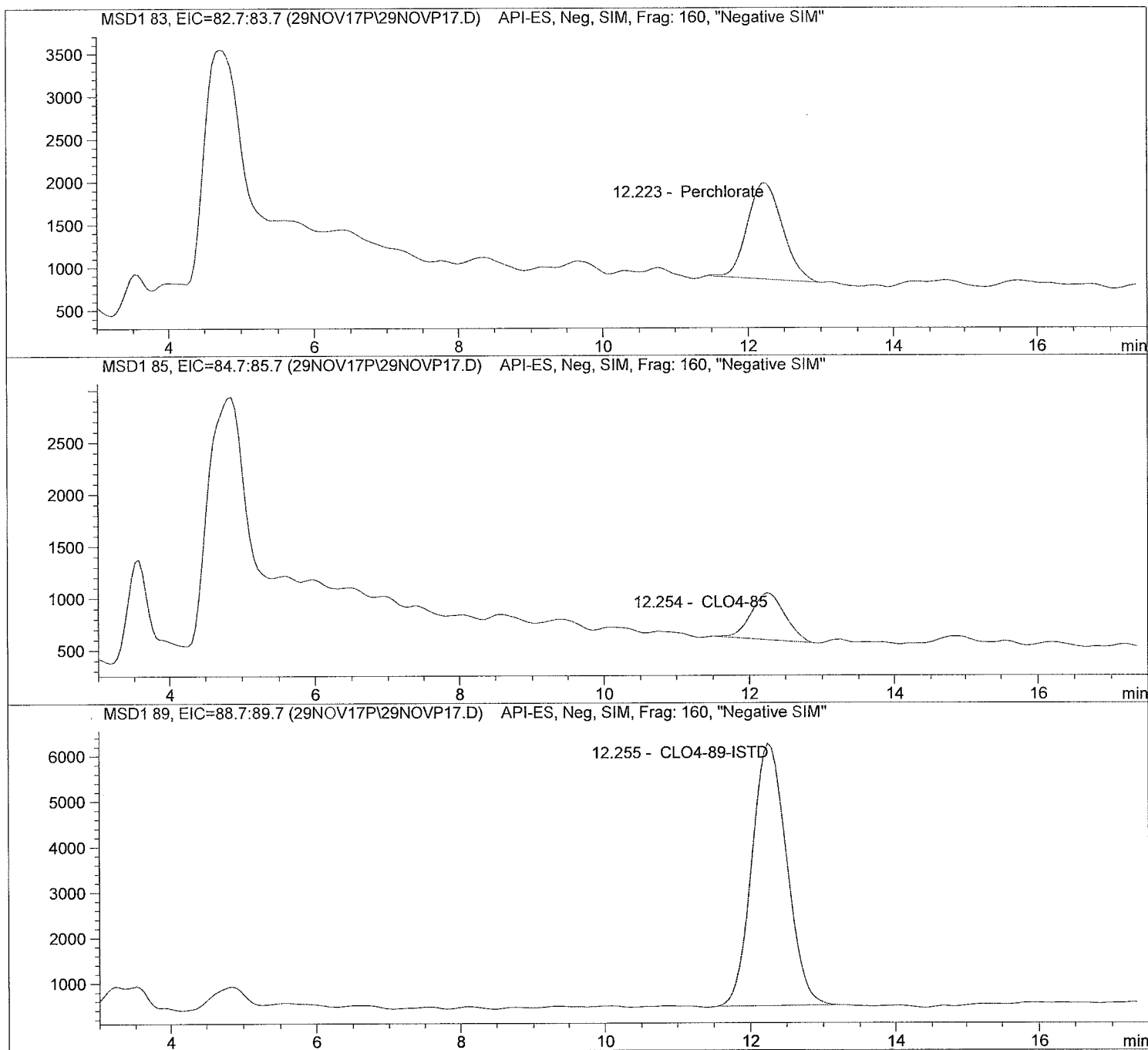
Injection Date:	11/29/2017 13:34:41	Seq Line:	17
Sample Name:	576098 LODV@1.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP17.D

Sample Name: 576098 LODV@1.

```
=====
Injection Date: 11/29/2017 13:34:41      Seq Line: 17
Sample Name: 576098 LODV@1.              Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.223	BBA	37866.1	0.9363	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.254	PBA	14544.5	0.8847	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.255	PBA	191758.3	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

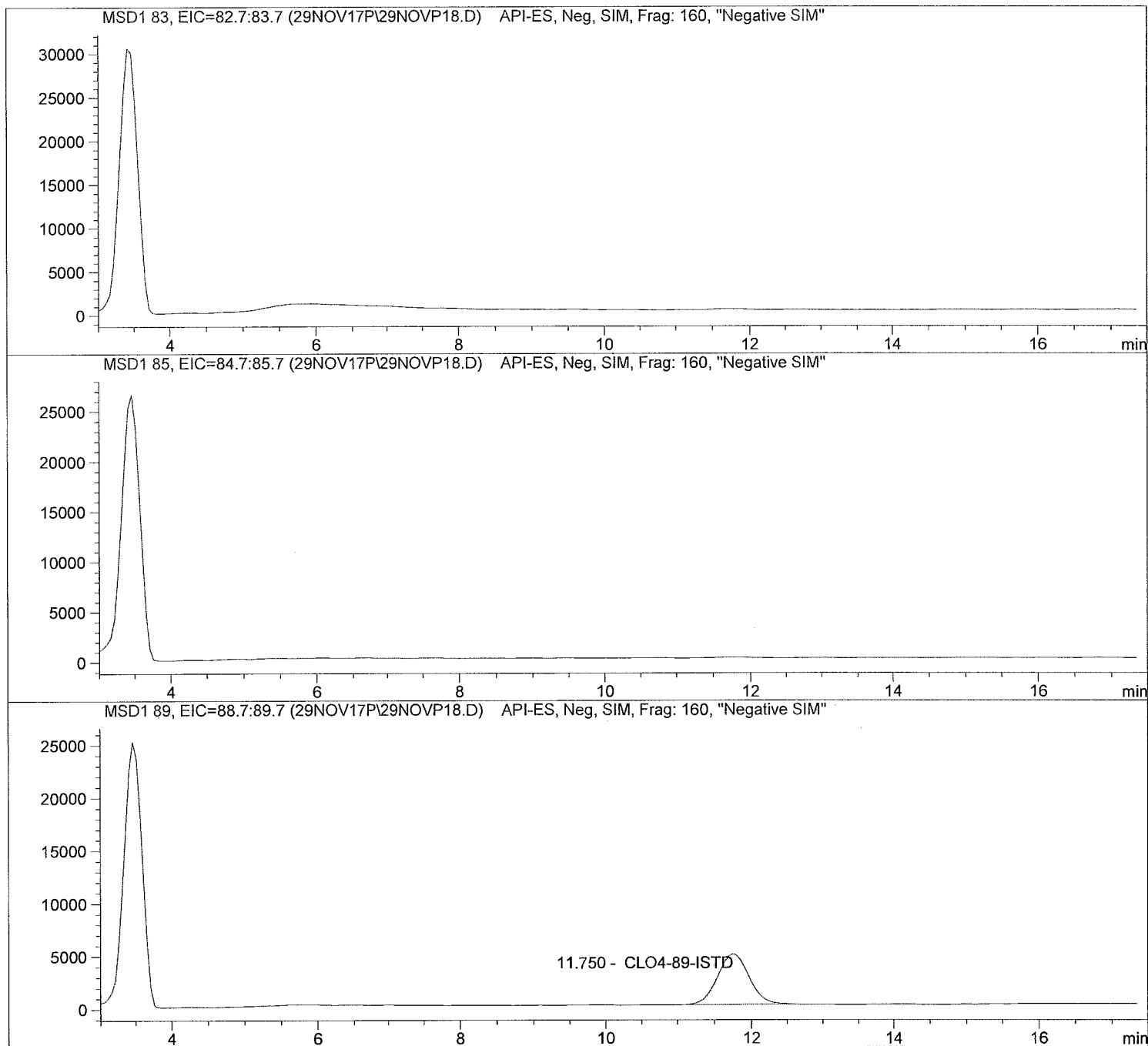
Injection Date:	11/29/2017 13:53:50	Seq Line:	18
Sample Name:	1732092001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====




```
=====
Injection Date: 11/29/2017 13:53:50      Seq Line: 18
Sample Name: 1732092001                  Location: Vial 86
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.750	PBA	142419.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

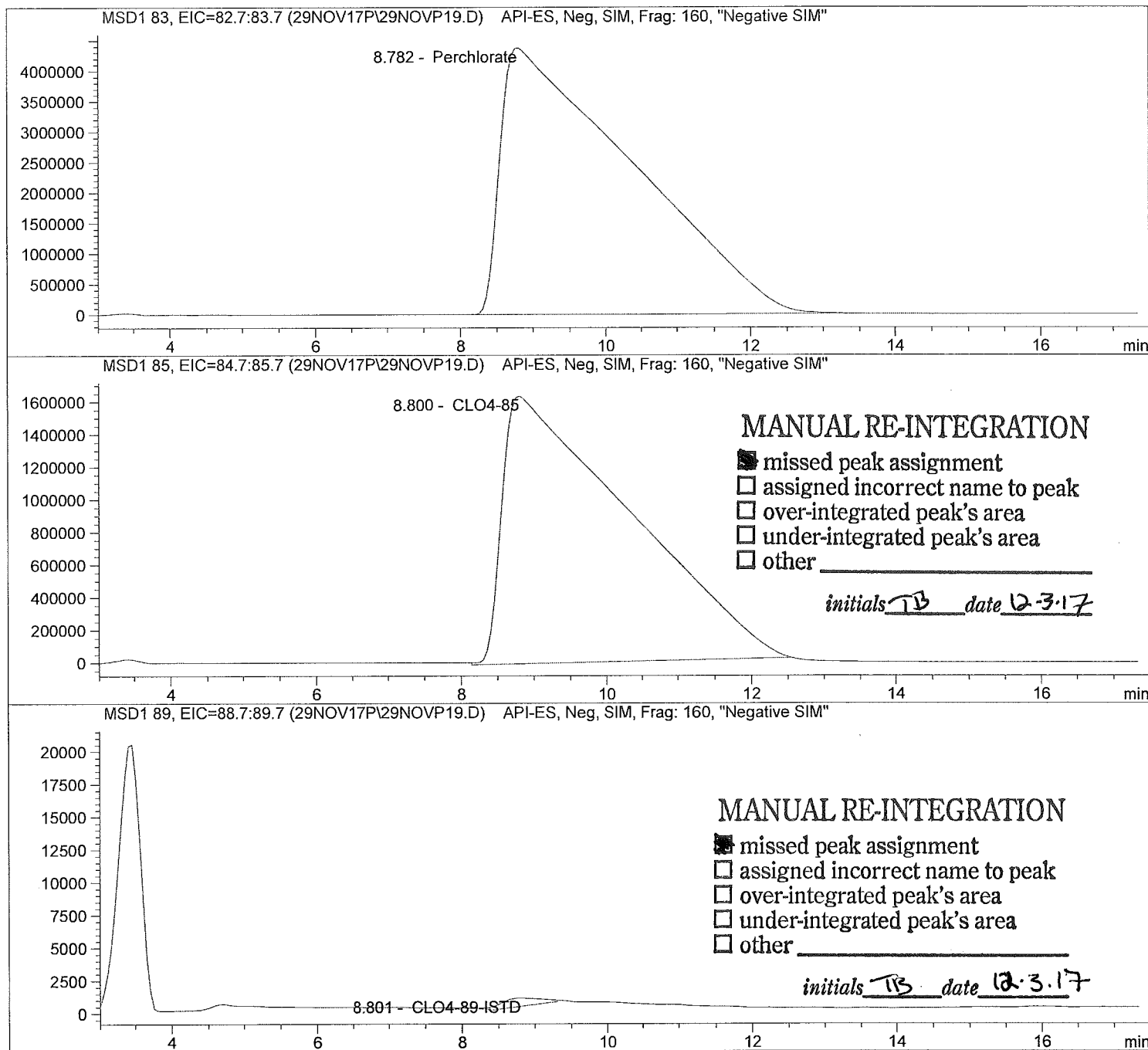
Injection Date:	11/29/2017 14:13:01	Seq Line:	19
Sample Name:	1732092002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP19.D

Sample Name: 1732092002

```
=====
Injection Date: 11/29/2017 14:13:01      Seq Line: 19
Sample Name: 1732092002                  Location: Vial 87
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.782	PBA	555201408.0	4376.1113	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.800	MM	199226384.0	5258.0357	CLO4-85
9.528	Rsho	0.0	0.0000	
10.202	Rsho	0.0	0.0000	
10.388	Rsho	0.0	0.0000	
10.770	Rsho	0.0	0.0000	
11.141	Rsho	0.0	0.0000	

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.801	MM	24156.1	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

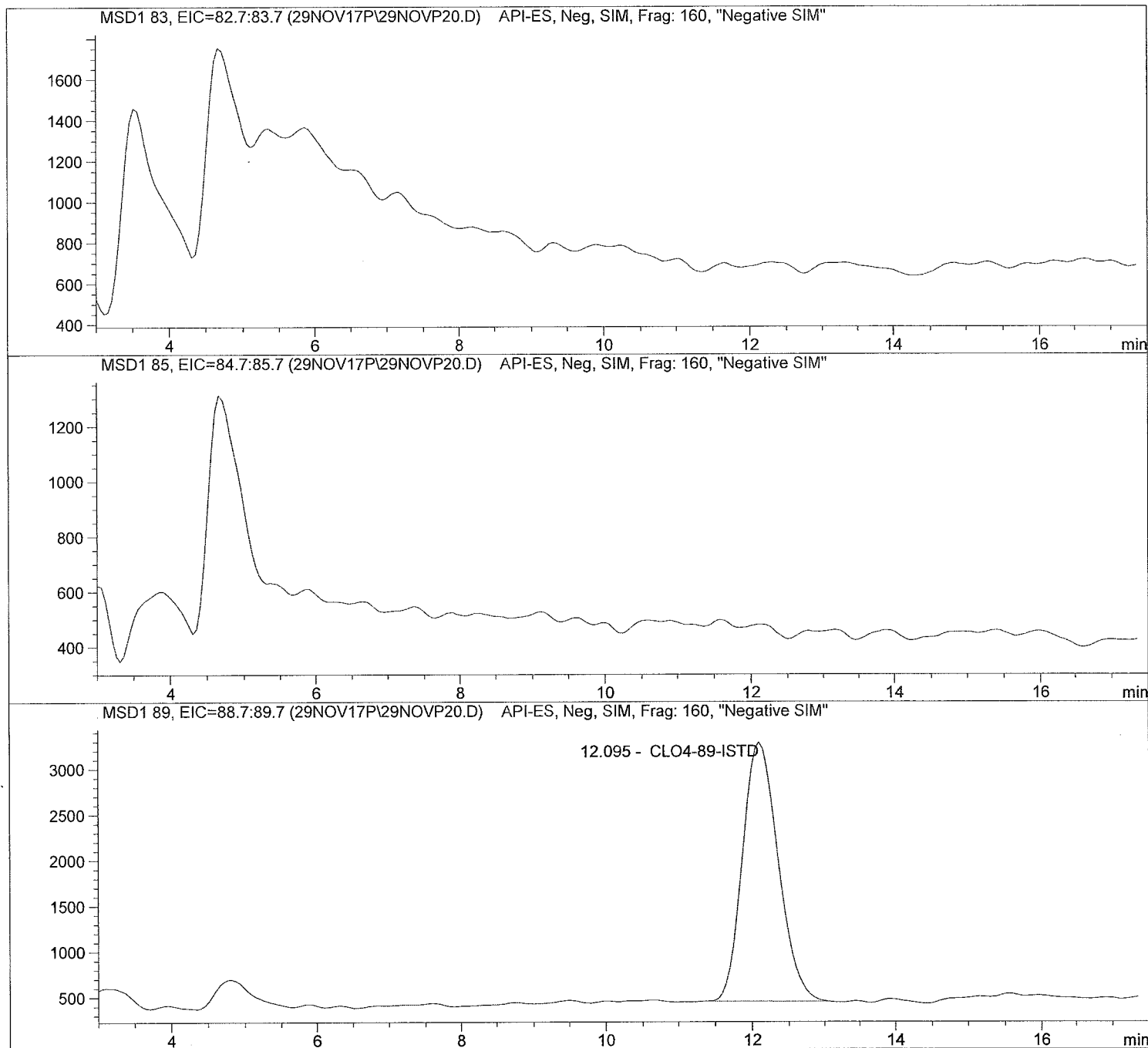
Injection Date:	11/29/2017 14:32:08	Seq Line:	20
Sample Name:	1732092003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP20.D

Sample Name: 1732092003

```
=====
Injection Date: 11/29/2017 14:32:08      Seq Line: 20
Sample Name: 1732092003                  Location: Vial 88
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.095	BBA	94865.6	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

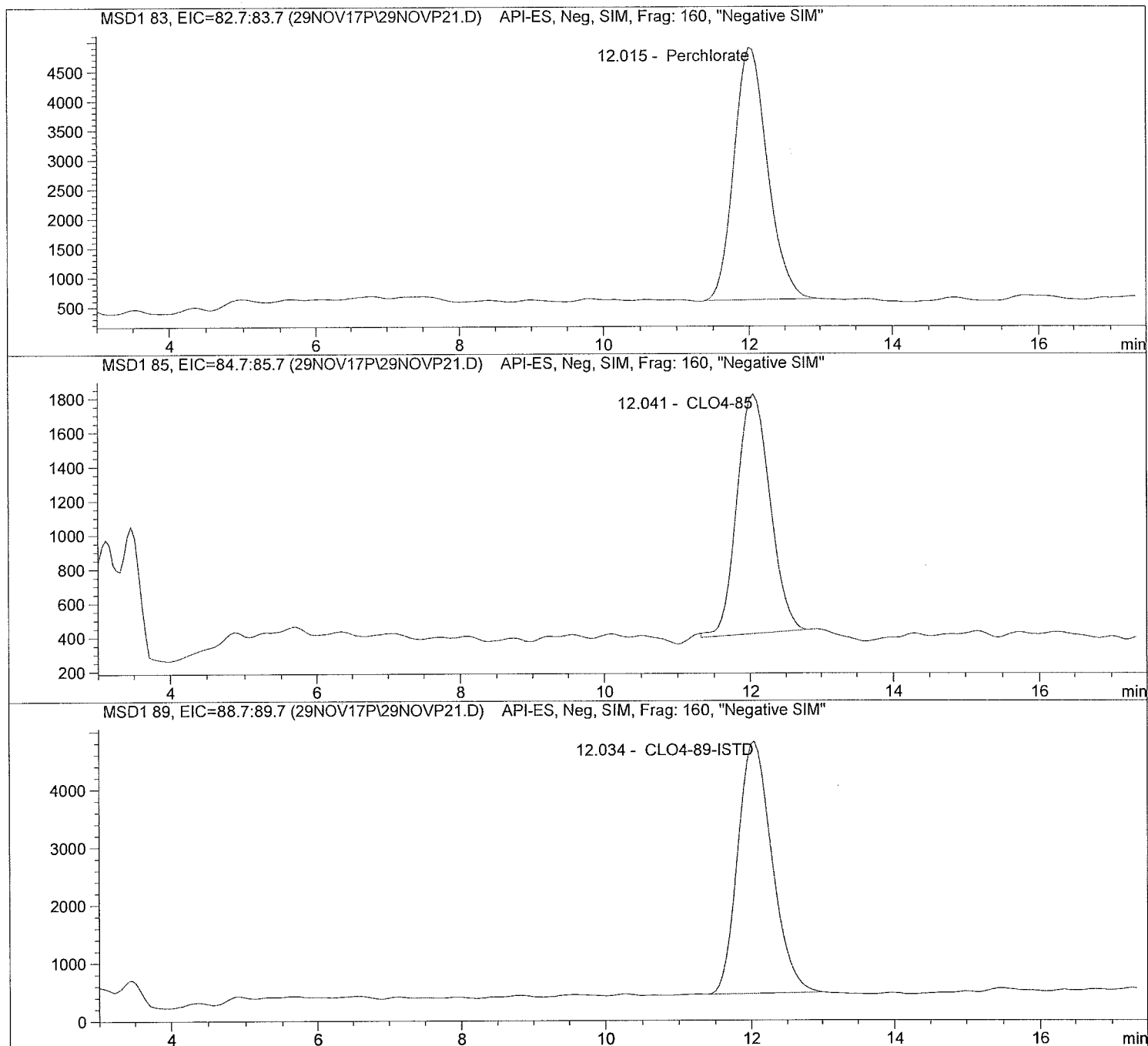
=====

Injection Date:	11/29/2017 14:51:19	Seq Line:	21
Sample Name:	1732412001	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP21.D

Sample Name: 1732412001

```
=====
Injection Date: 11/29/2017 14:51:19      Seq Line: 21
Sample Name: 1732412001                  Location: Vial 89
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.015	PBA	138593.5	4.3832	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.041	BBA	44939.1	4.2141	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.034	PBA	144200.5	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

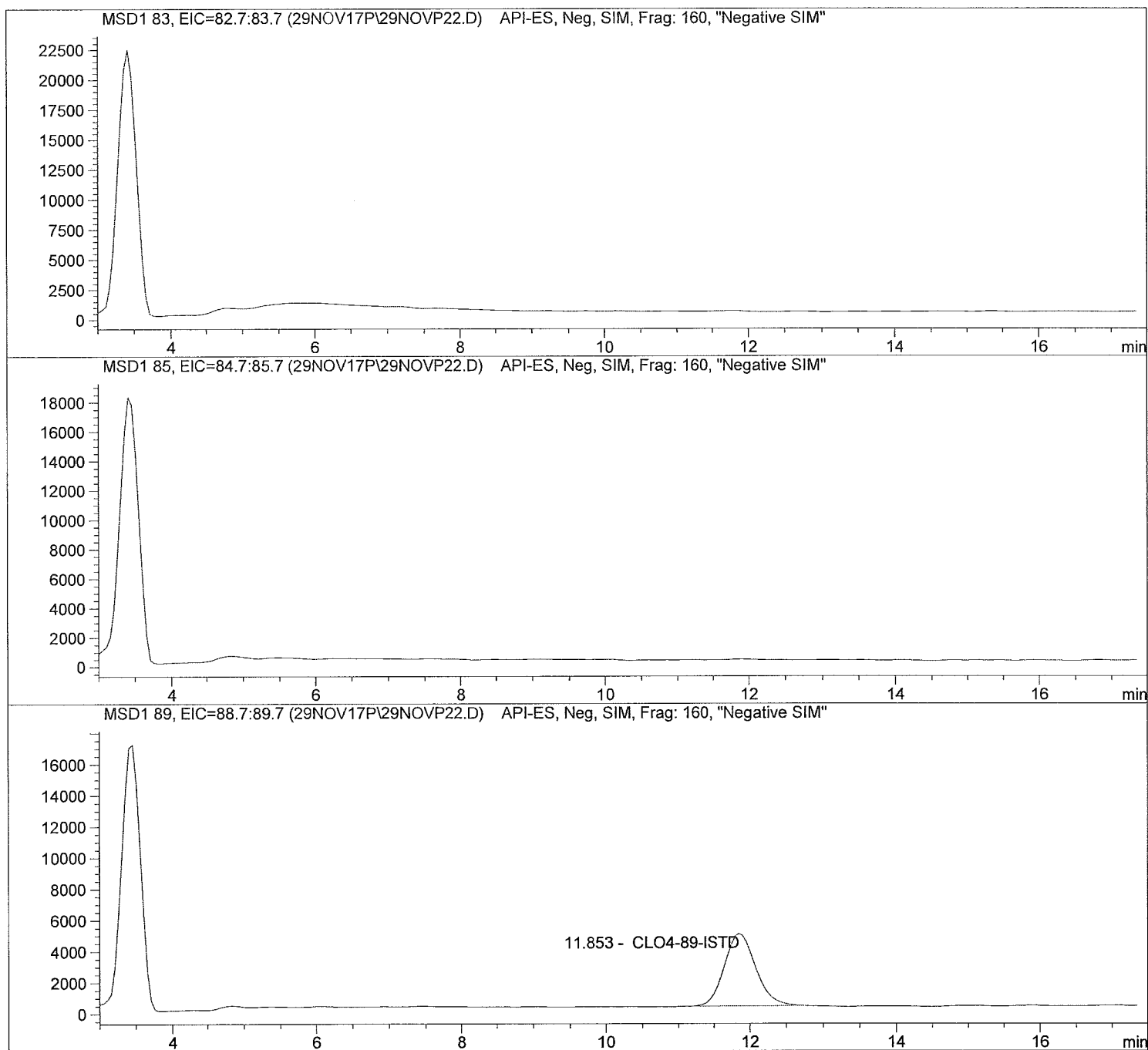
Injection Date:	11/29/2017 15:10:31	Seq Line:	22
Sample Name:	1732412002	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP22.D

Sample Name: 1732412002

```

=====
Injection Date: 11/29/2017 15:10:31      Seq Line:      22
Sample Name:    1732412002              Location:      Vial 90
Acq Operator:   TNB                     Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.853	BBA	140770.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

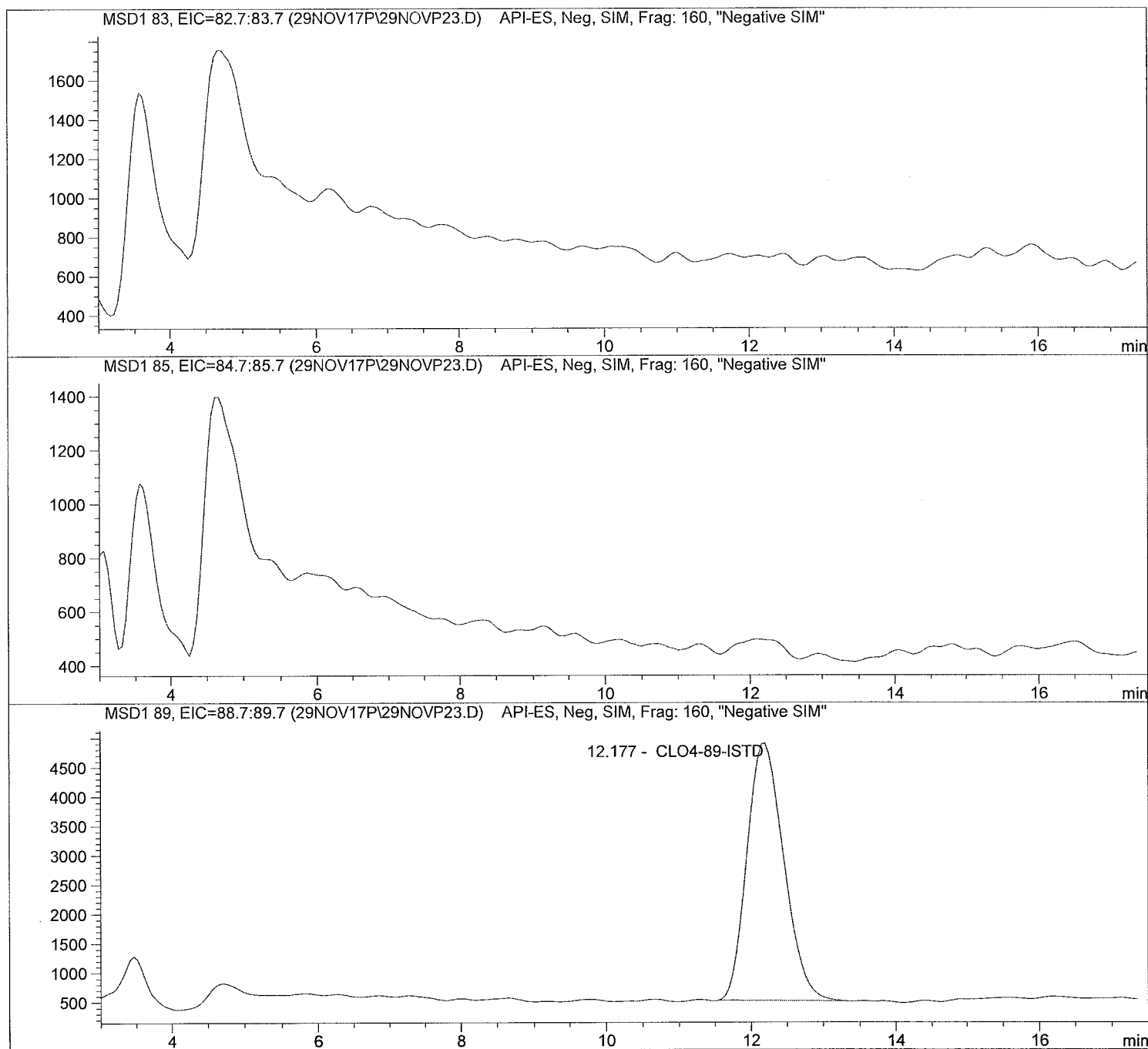
=====

Injection Date:	11/29/2017 15:29:42	Seq Line:	23
Sample Name:	1732412003	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP23.D

Sample Name: 1732412003

```

=====
Injection Date: 11/29/2017 15:29:42      Seq Line:      23
Sample Name:    1732412003              Location:      Vial 91
Acq Operator:   TNB                     Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.177	BBA	155137.1	5.0000	CLO4-89-ISTD

```

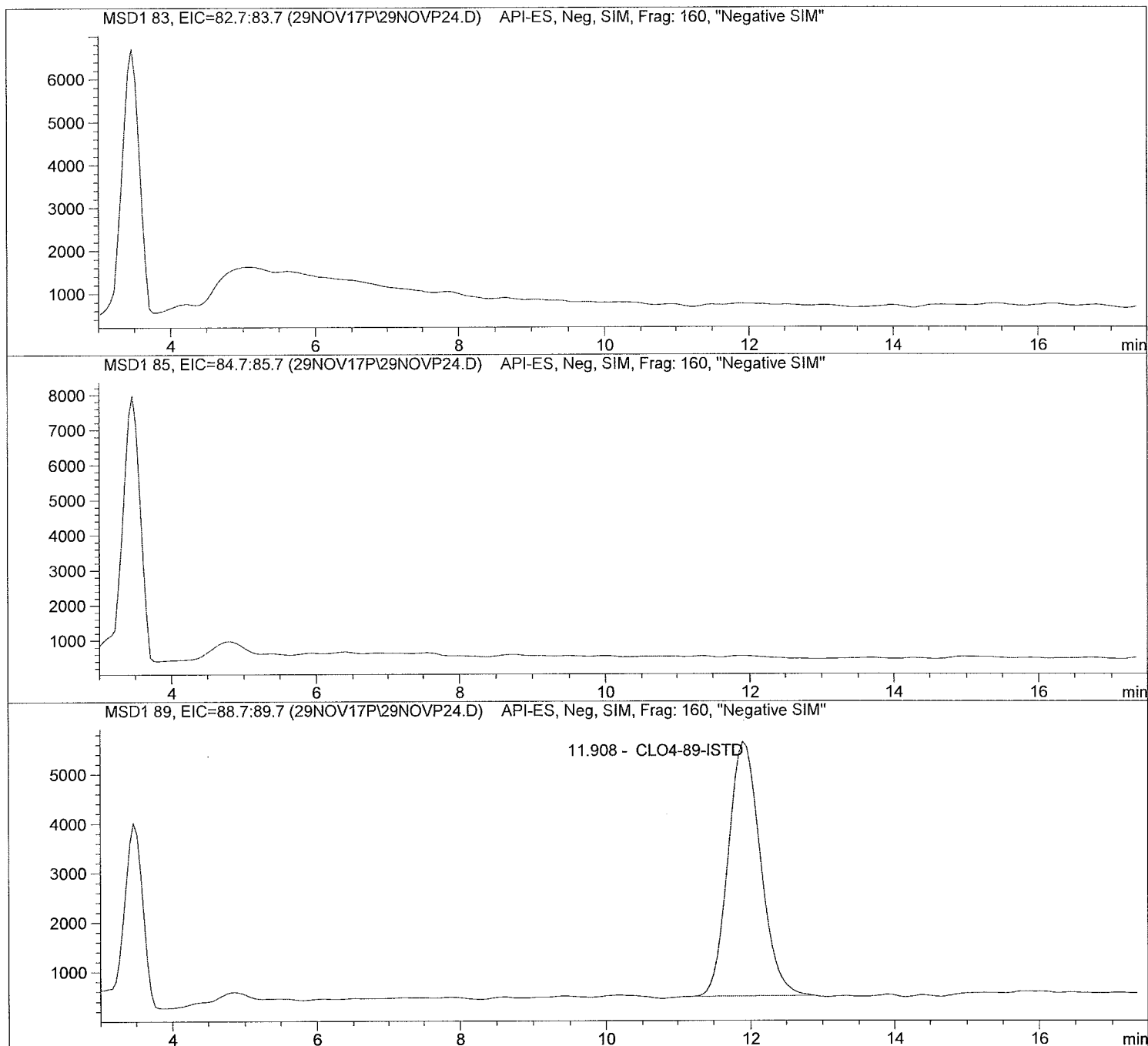
=====
*** End of Report ***

```

```
=====
Injection Date: 11/29/2017 15:48:50      Seq Line:      24
Sample Name:    1732412004              Location:      Vial 92
Acq Operator:   TNB                     Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   11/29/2017 08:03:05
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP24.D

Sample Name: 1732412004

```
=====
Injection Date: 11/29/2017 15:48:50      Seq Line: 24
Sample Name: 1732412004                  Location: Vial 92
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.908	BBA	156768.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

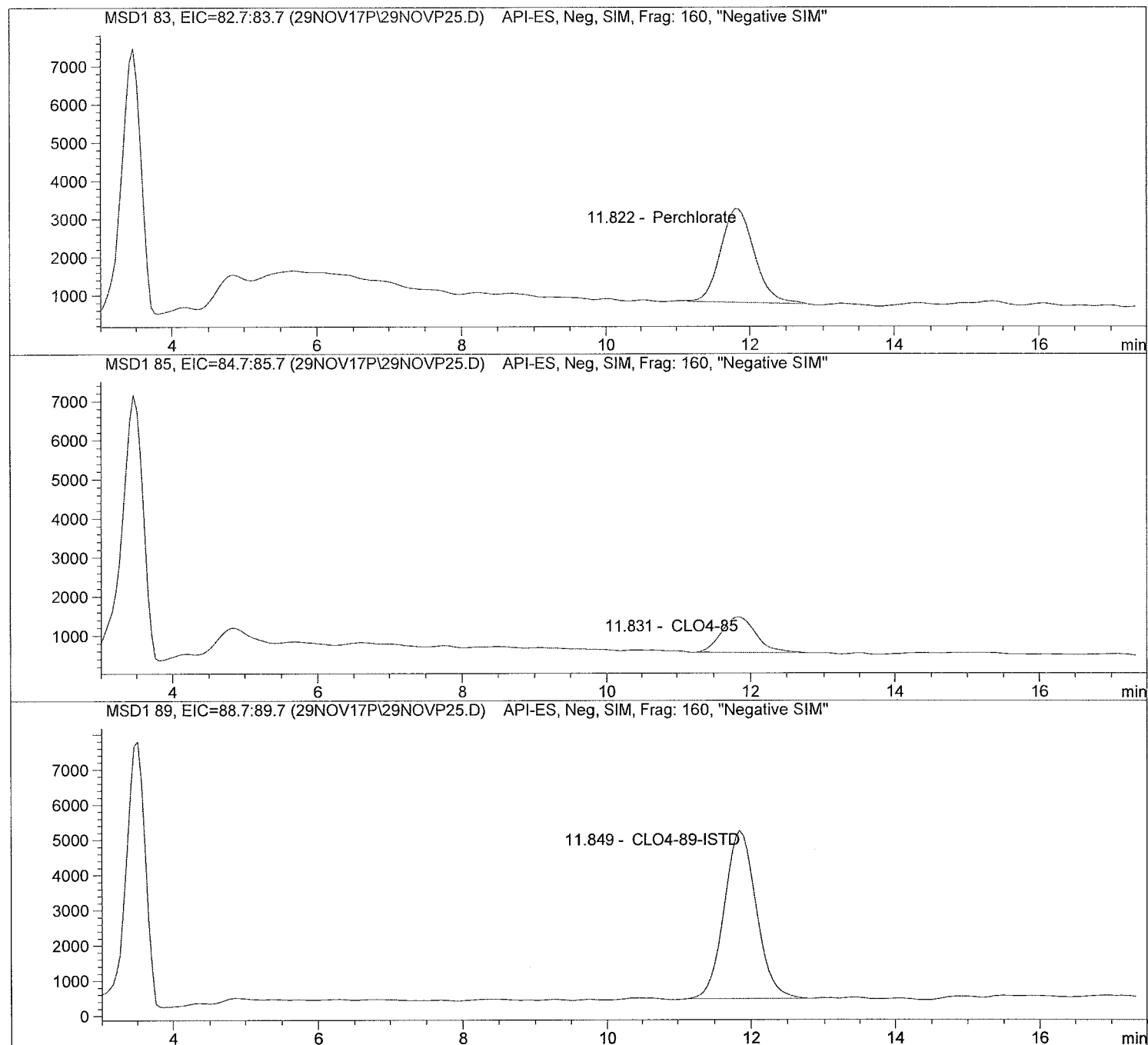
Injection Date:	11/29/2017 16:07:59	Seq Line:	25
Sample Name:	1732412005	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP25.D

Sample Name: 1732412005

```
=====
Injection Date: 11/29/2017 16:07:59      Seq Line: 25
Sample Name: 1732412005                  Location: Vial 93
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.822	BBA	79044.6	2.4990	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.831	PBA	30386.0	2.7574	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.849	PBA	146299.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

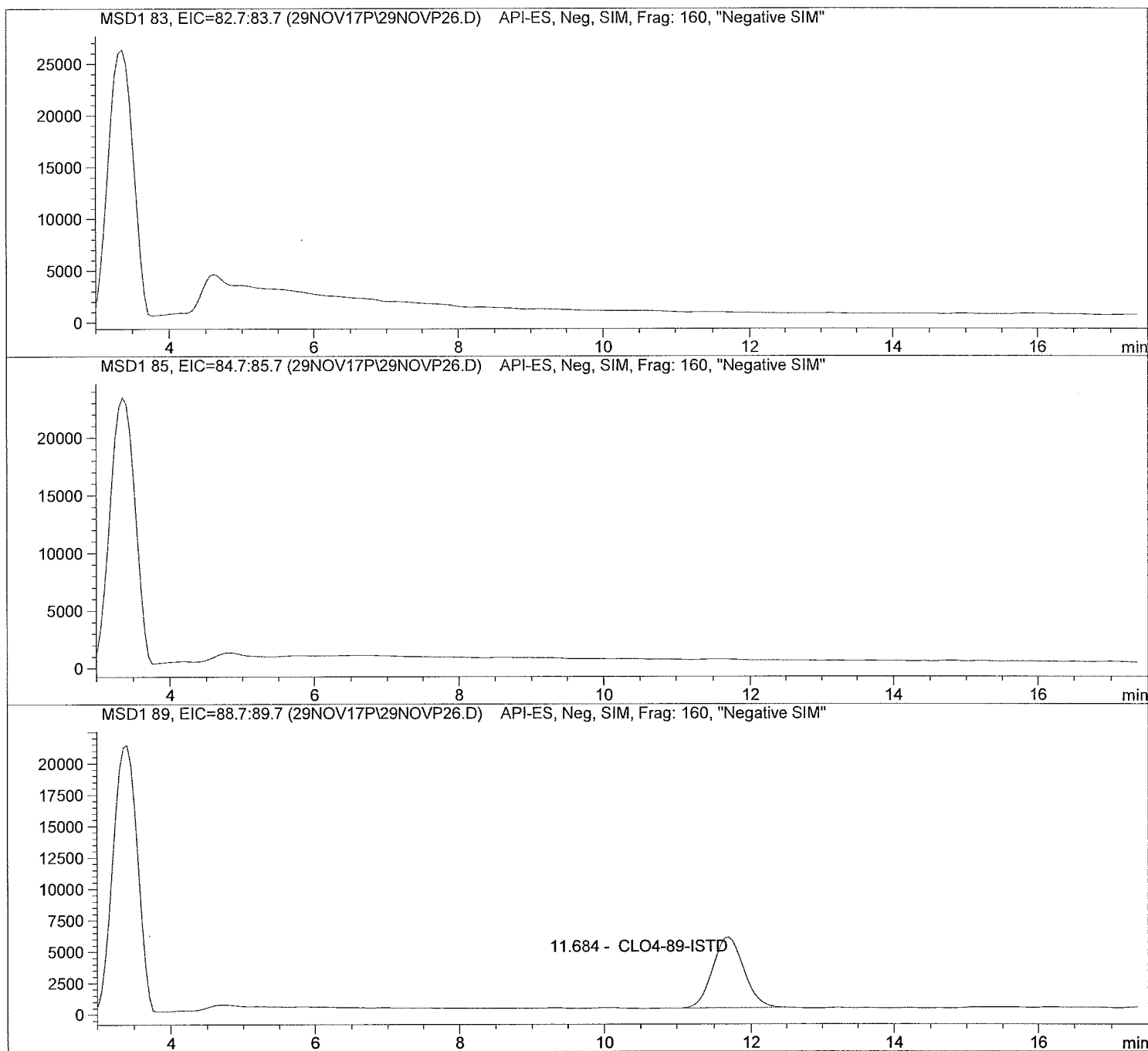
Injection Date:	11/29/2017 16:28:06	Seq Line:	26
Sample Name:	1732412006	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP26.D

Sample Name: 1732412006

```

=====
Injection Date: 11/29/2017 16:28:06      Seq Line:      26
Sample Name:    1732412006              Location:      Vial 94
Acq Operator:   TNB                     Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   11/29/2017 08:03:05

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.684	PBA	164919.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

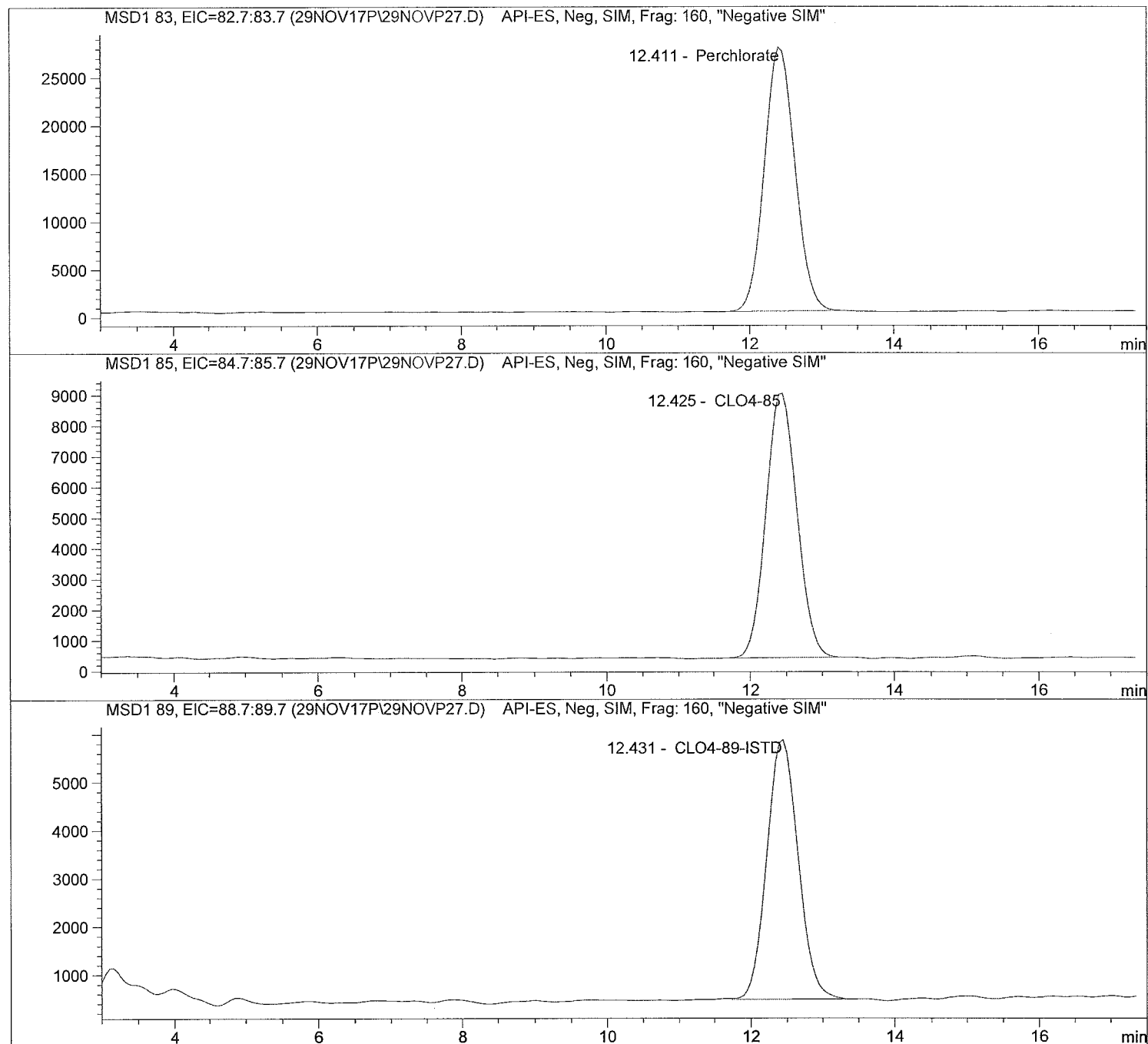
=====

Injection Date:	11/29/2017 16:47:15	Seq Line:	27
Sample Name:	1732092002 1K	Location:	Vial 97
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP27.D

Sample Name: 1732092002 1K

```
=====
Injection Date: 11/29/2017 16:47:15      Seq Line: 27
Sample Name: 1732092002 1K              Location: Vial 97
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1000.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.411	PBA	804721.5	20768.4797	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.425	BBA	256280.8	20810.0709	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.431	BBA	162071.5	5000.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

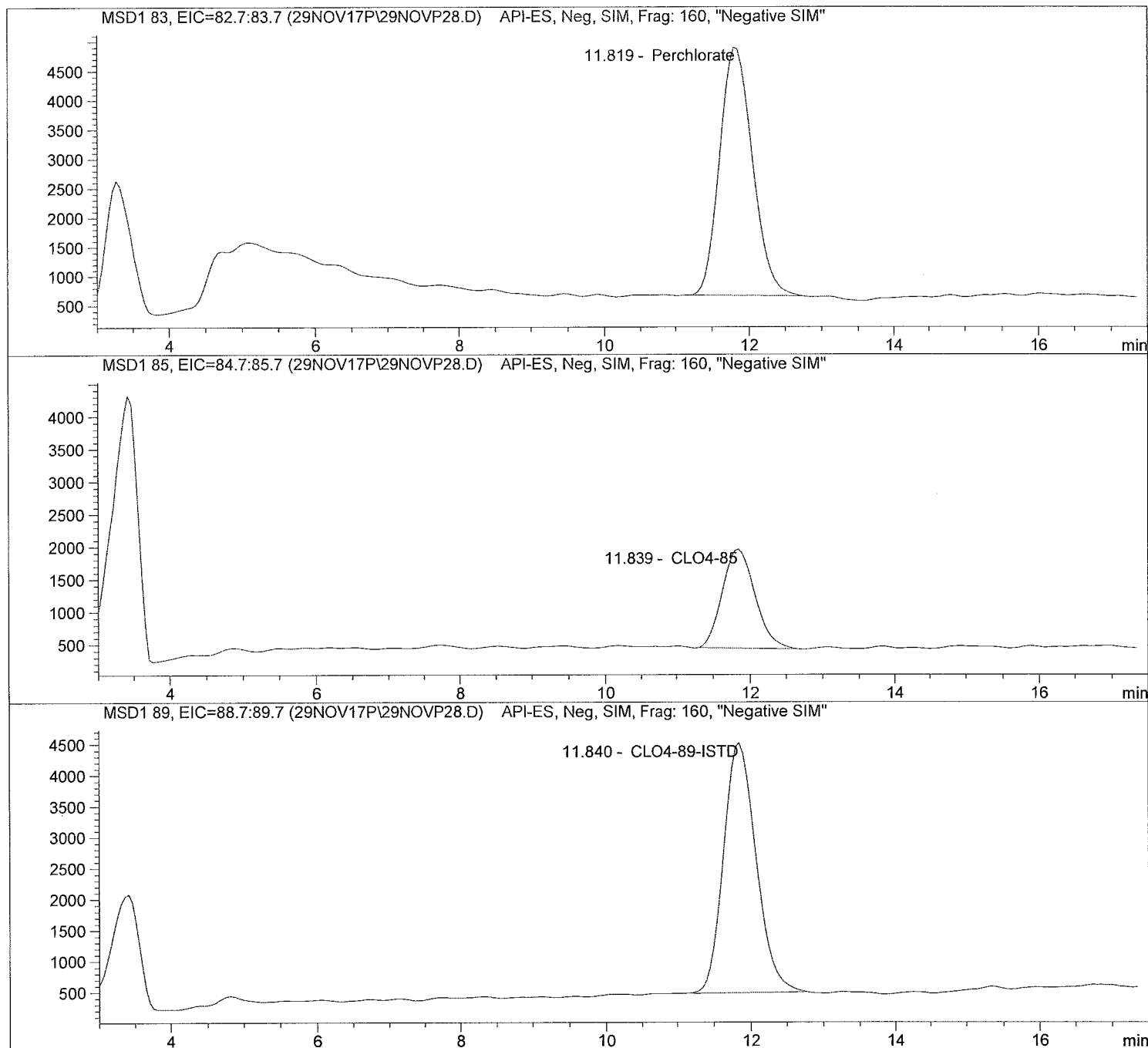
Injection Date:	11/29/2017 17:06:24	Seq Line:	28
Sample Name:	576095 320911S	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP28.D

Sample Name: 576095 320911S

```
=====
Injection Date: 11/29/2017 17:06:24      Seq Line: 28
Sample Name: 576095 320911S              Location: Vial 95
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.819	BBA	130496.4	4.8178	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.839	PBA	46550.2	5.1337	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.840	BBA	123186.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Injection Date: 11/29/2017 17:25:33

Seq Line: 29

Sample Name: 576096 320911D

Location: Vial 96

Acq Operator: TNB

Inj. No.: 1

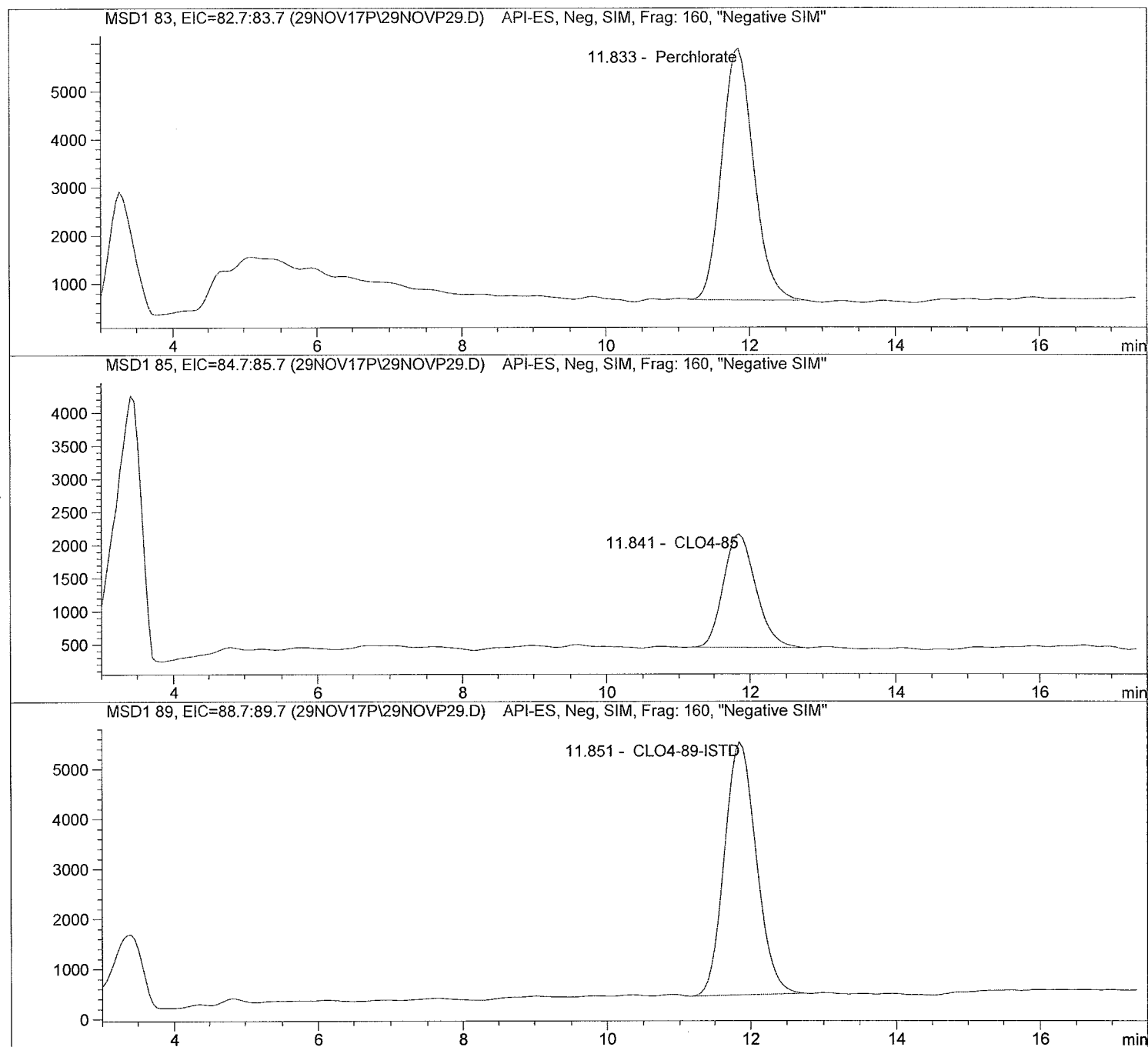
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP29.D

Sample Name: 576096 320911D

```
=====
Injection Date: 11/29/2017 17:25:33      Seq Line: 29
Sample Name: 576096 320911D             Location: Vial 96
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.833	BBA	161296.6	4.7104	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.841	BBA	53615.5	4.6648	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.851	PBA	155836.8	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

=====

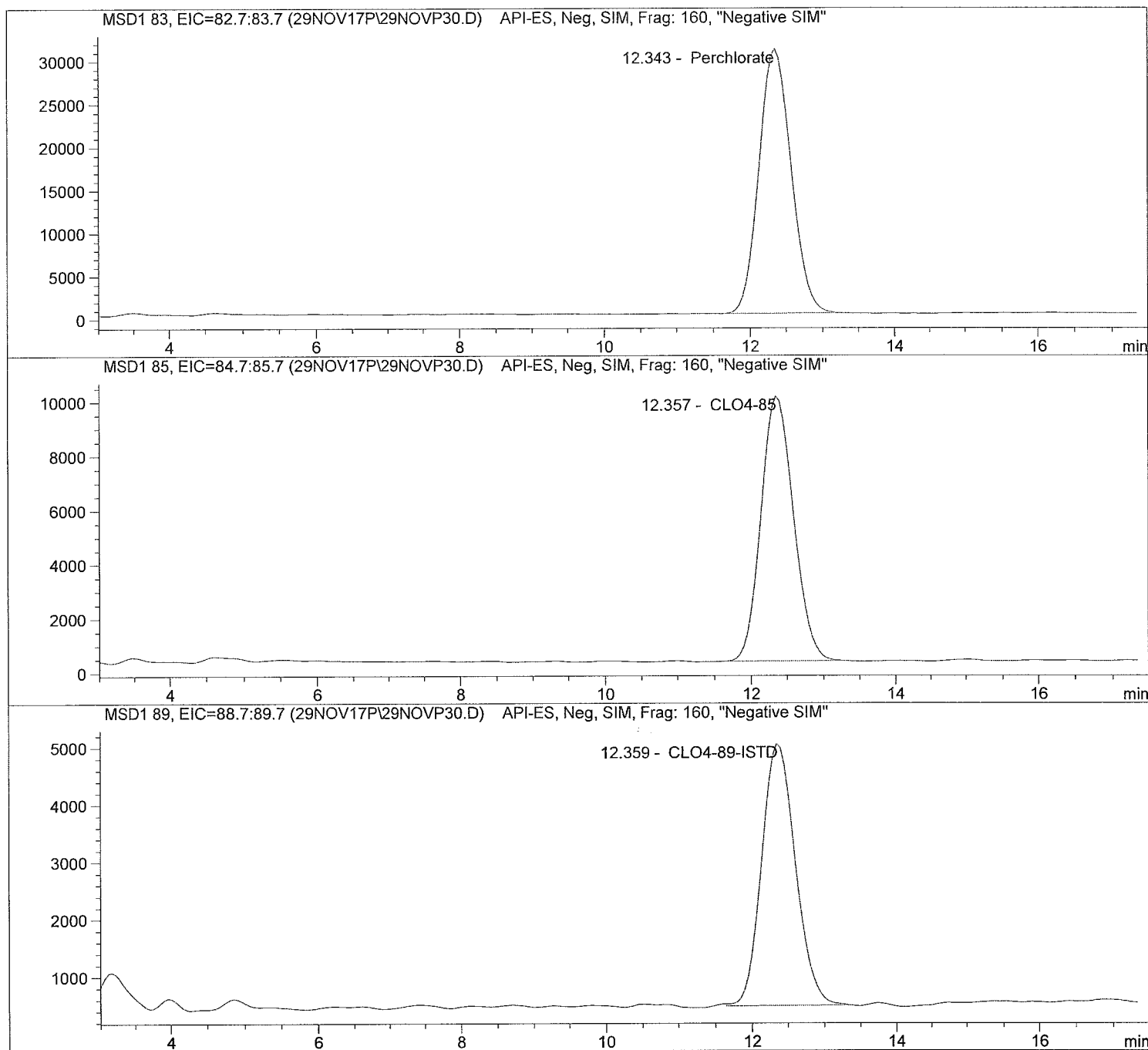
Injection Date:	11/29/2017 17:44:41	Seq Line:	30
Sample Name:	576099 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====




```
=====
Injection Date: 11/29/2017 17:44:41      Seq Line: 30
Sample Name: 576099 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====

Sample Information

=====

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.343	PBA	948245.2	26.1623	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.357	BBA	304730.7	26.6177	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.359	BBA	147735.5	5.0000	CLO4-89-ISTD

=====

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP31.D

Sample Name: 576100 LODV@1.

Injection Date: 11/29/2017 18:03:49

Seq Line: 31

Sample Name: 576100 LODV@1.

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

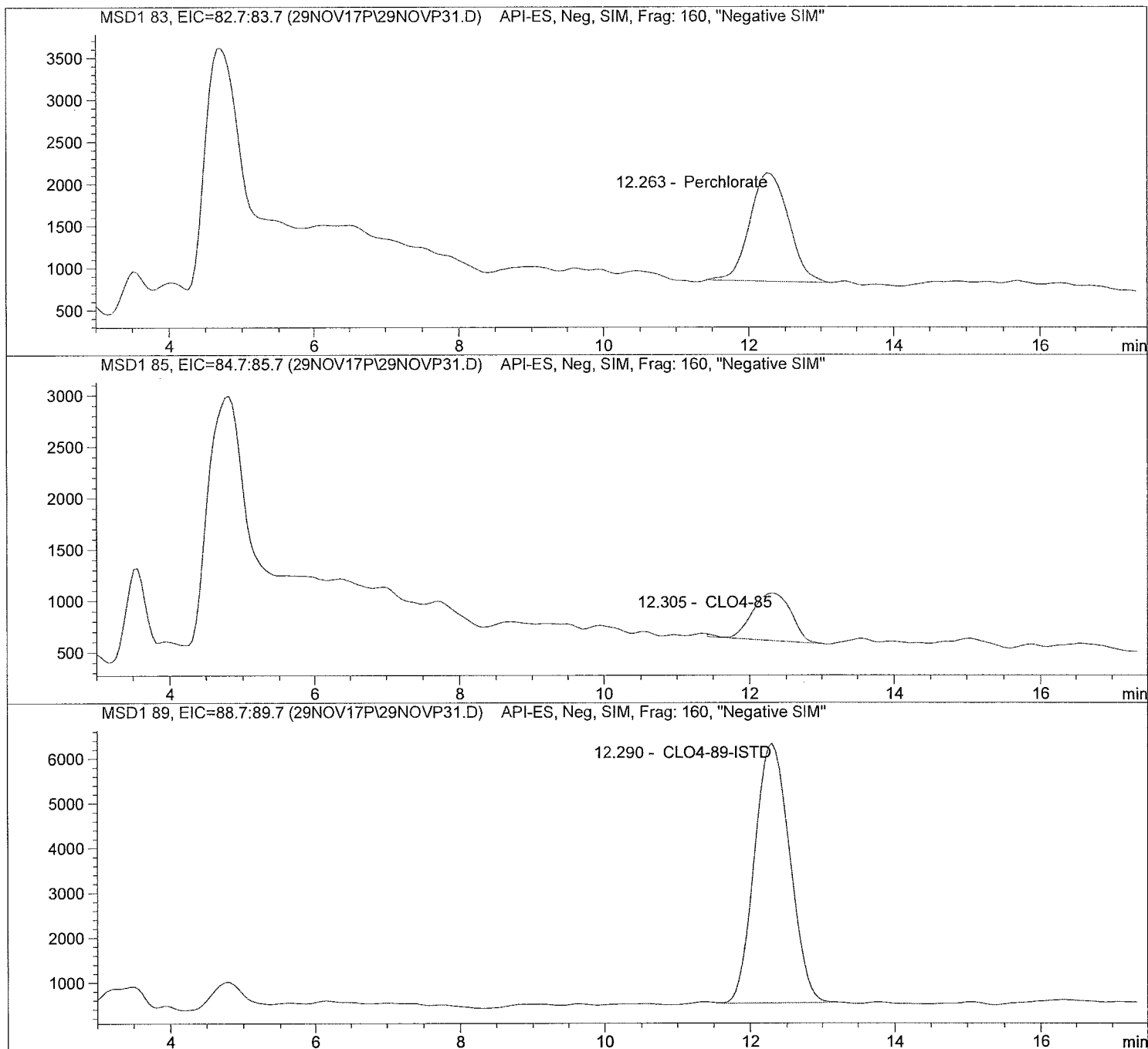
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\29NOV17P\29NOVP31.D Sample Name: 576100 LODV@1.

```
=====
Injection Date: 11/29/2017 18:03:49      Seq Line: 31
Sample Name: 576100 LODV@1.             Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.263	BBA	47384.4	1.1505	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.305	BBA	17106.3	1.0604	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.290	BBA	194093.8	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

 Calibration Table

Perchlorate

Calib. Data Modified : 11/29/2017 8:02:06 AM

Calculate : Internal Standard

Based on : Peak Area

Rel. Reference Window : 20.000 %

Abs. Reference Window : 0.000 min

Rel. Non-ref. Window : 20.000 %

Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs

Uncalibrated Peaks : not reported

Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)

Origin : Ignored (some peaks differ, see below)

Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:

Average Response : Average all calibrations

Average Retention Time: Floating Average New 75%

Calibration Report Options :

Printout of recalibrations within a sequence:

Calibration Table after Recalibration

Normal Report after Recalibration

If the sequence is done with bracketing:

Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name

#

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7

Signal 2: MSD1 85, EIC=84.7:85.7

Signal 3: MSD1 89, EIC=88.7:89.7

RetTime Lvl Amount Area Amt/Area Ref Grp Name

[min] Sig

RetTime [min]	Lvl	Sig	Amount	Area	Amt/Area	Ref	Grp	Name
12.090	1	1	1.00000	4.10942e4	2.43343e-5	1		Perchlorate
		2	2.00000	7.74077e4	2.58372e-5			
		3	5.00000	1.92985e5	2.59088e-5			
		4	10.00000	3.91583e5	2.55374e-5			
		5	25.00000	1.09763e6	2.27764e-5			
		6	50.00000	2.29834e6	2.17549e-5			
		7	75.00000	3.73021e6	2.01061e-5			
12.106	2	1	1.00000	1.56787e4	6.37808e-5	1		CLO4-85
		2	2.00000	2.80487e4	7.13046e-5			
		3	5.00000	6.51323e4	7.67668e-5			
		4	10.00000	1.31325e5	7.61471e-5			
		5	25.00000	3.46913e5	7.20642e-5			
		6	50.00000	6.96156e5	7.18230e-5			
		7	75.00000	1.13077e6	6.63264e-5			
12.107	3	1	5.00000	1.88880e5	2.64718e-5	+I1		CLO4-89-ISTD
		2	5.00000	1.81109e5	2.76076e-5			
		3	5.00000	1.75128e5	2.85505e-5			
		4	5.00000	1.80962e5	2.76301e-5			
		5	5.00000	1.75597e5	2.84743e-5			
		6	5.00000	1.69148e5	2.95599e-5			
		7	5.00000	1.64867e5	3.03275e-5			

ethod C:\HPCHEM\1\METHODS\CLO4-DPR.M

More compound-specific settings:

Compound: Perchlorate

Time Window : From 8.390 min To 13.052 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 8.366 min To 13.046 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

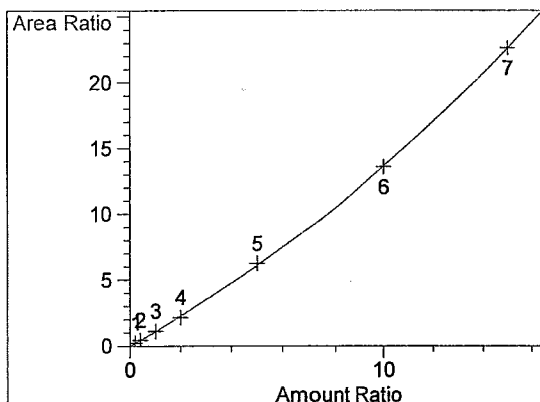
Compound: CLO4-89-ISTD

Time Window : From 8.457 min To 13.107 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Peak Sum Table

No Entries in table

Calibration Curves



Perchlorate at exp. RT: 12.090
 MSD1 83, EIC=82.7:83.7

Correlation: 0.99991

Residual Std. Dev.: 0.08487

Formula: $y = ax^2 + bx + c$

a: 2.87739e-2

b: 1.07712

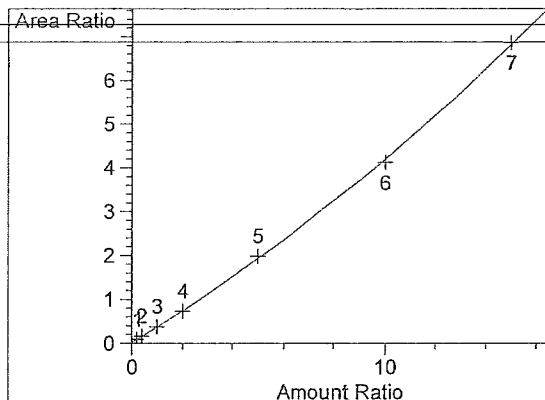
c: -5.23718e-3

x: Amount Ratio

y: Area Ratio

Calibration Level Weights:

Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 12.106

MSD1 85, EIC=84.7:85.7

Correlation: 0.99988

Residual Std. Dev.: 0.04548

Formula: $y = ax^2 + bx + c$

a: 7.12800e-3

b: 3.46840e-1

c: 1.42573e-2

x: Amount Ratio

y: Area Ratio

Calibration Level Weights:

Level 1 : 1

Level 2 : 0.5

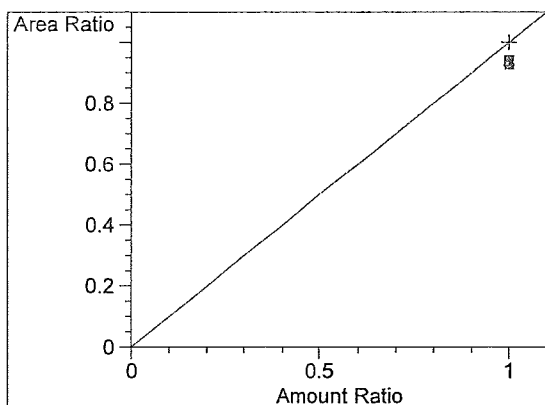
Level 3 : 0.2

Level 4 : 0.1

Level 5 : 0.04

Level 6 : 0.02

Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 12.107

MSD1 89, EIC=88.7:89.7

Correlation: 1.00000

Residual Std. Dev.: 0.00000

Formula: $y = mx + b$

m: 1.00000

b: 0.00000

x: Amount Ratio

y: Area Ratio

Calibration Level Weights:

Level 1 : 1

Level 2 : 1

Level 3 : 1

Level 4 : 1

Level 5 : 1

Level 6 : 1

Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\28NOV17P\28NOV17P.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.M

['#' ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#*	Sample Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount	
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	4.10942e4	12.029	1.02861
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	7.74077e4	12.054	1.98725
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	1.92985e5	12.090	5.00575
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	3.91583e5	12.084	9.57892
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	1.09763e6	12.065	25.55231
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	2.29834e6	12.065	49.83164
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	3.73021e6	12.090	74.99992
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	3.83615e5	12.163	9.59533

#*	Sample Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	1.56787e4	12.053	9.87106e-1
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	2.80487e4	12.066	2.01046
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	6.51323e4	12.106	5.05104
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	1.31325e5	12.101	9.85678
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	3.46913e5	12.084	25.58435
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	6.96156e5	12.080	49.18282
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	1.13077e6	12.106	75.33907
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	1.31460e5	12.177	10.08554

#*	Sample Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	1.88880e5	12.050	5.00000
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	1.81109e5	12.078	5.00000
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	1.75128e5	12.110	5.00000
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	1.80962e5	12.109	5.00000
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	1.75597e5	12.084	5.00000
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	1.69148e5	12.086	5.00000
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	1.64867e5	12.107	5.00000
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	1.76961e5	12.181	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	==	=====	=====	=====
1	Vial 71	ICAL1@ 1.0ug/L	CLO4-DOD	1	Ctrl Samp		
2	Vial 72	ICAL2@ 2.0ug/L	CLO4-DOD	1	Ctrl Samp		
3	Vial 73	ICAL3@ 5.0ug/L	CLO4-DOD	1	Ctrl Samp		
4	Vial 74	ICAL4@ 10.ug/L	CLO4-DOD	1	Ctrl Samp		
5	Vial 75	ICAL5@ 25.ug/L	CLO4-DOD	1	Ctrl Samp		
6	Vial 76	ICAL6@ 50.ug/L	CLO4-DOD	1	Ctrl Samp		
7	Vial 77	ICAL7@ 75.ug/L	CLO4-DOD	1	Ctrl Samp		
8	Vial 78	ICAL Verf@10ug/L	CLO4-DOD	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

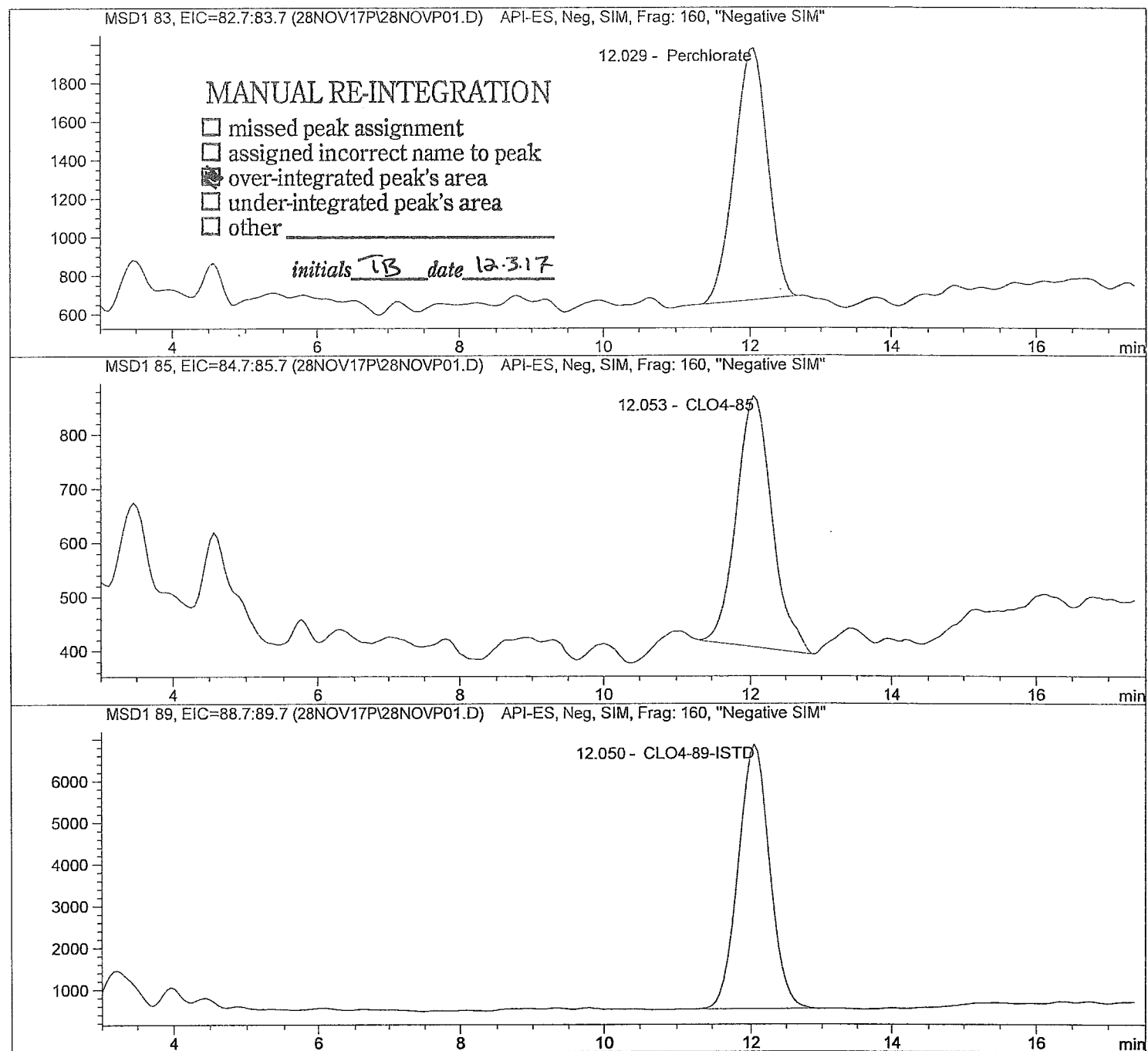
Injection Date:	11/28/2017 09:08:10	Seq Line:	1
Sample Name:	ICAL1@ 1.0ug/L	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

```

=====
Injection Date: 11/28/2017 09:08:10      Seq Line: 1
Sample Name: ICAL1@ 1.0ug/L             Location: Vial 71
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====

```

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.029	MM	41094.2	1.0286	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.053	BBA	15678.7	0.9871	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.050	BBA	188880.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP02.D

Sample Name: ICAL2@ 2.0ug/L

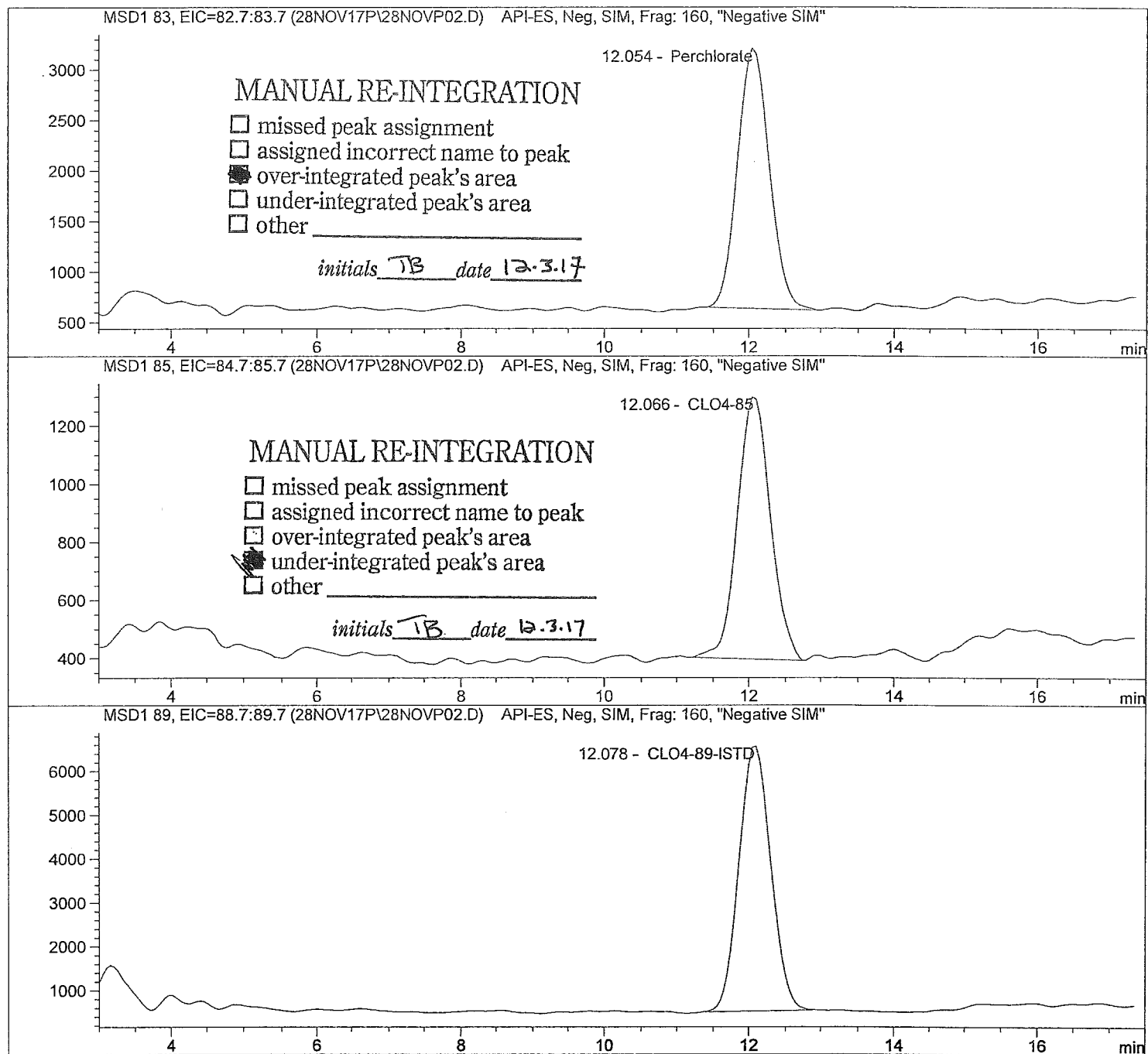
Injection Date:	11/28/2017 09:33:49	Seq Line:	2
Sample Name:	ICAL2@ 2.0ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP02.D

Sample Name: ICAL2@ 2.0ug/L

Injection Date:	11/28/2017 09:33:49	Seq Line:	2
Sample Name:	ICAL2@ 2.0ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.054	MM	77407.7	1.9872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.066	MM	28048.7	2.0105	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.078	PBA	181109.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP03.D

Sample Name: ICAL3@ 5.0ug/L

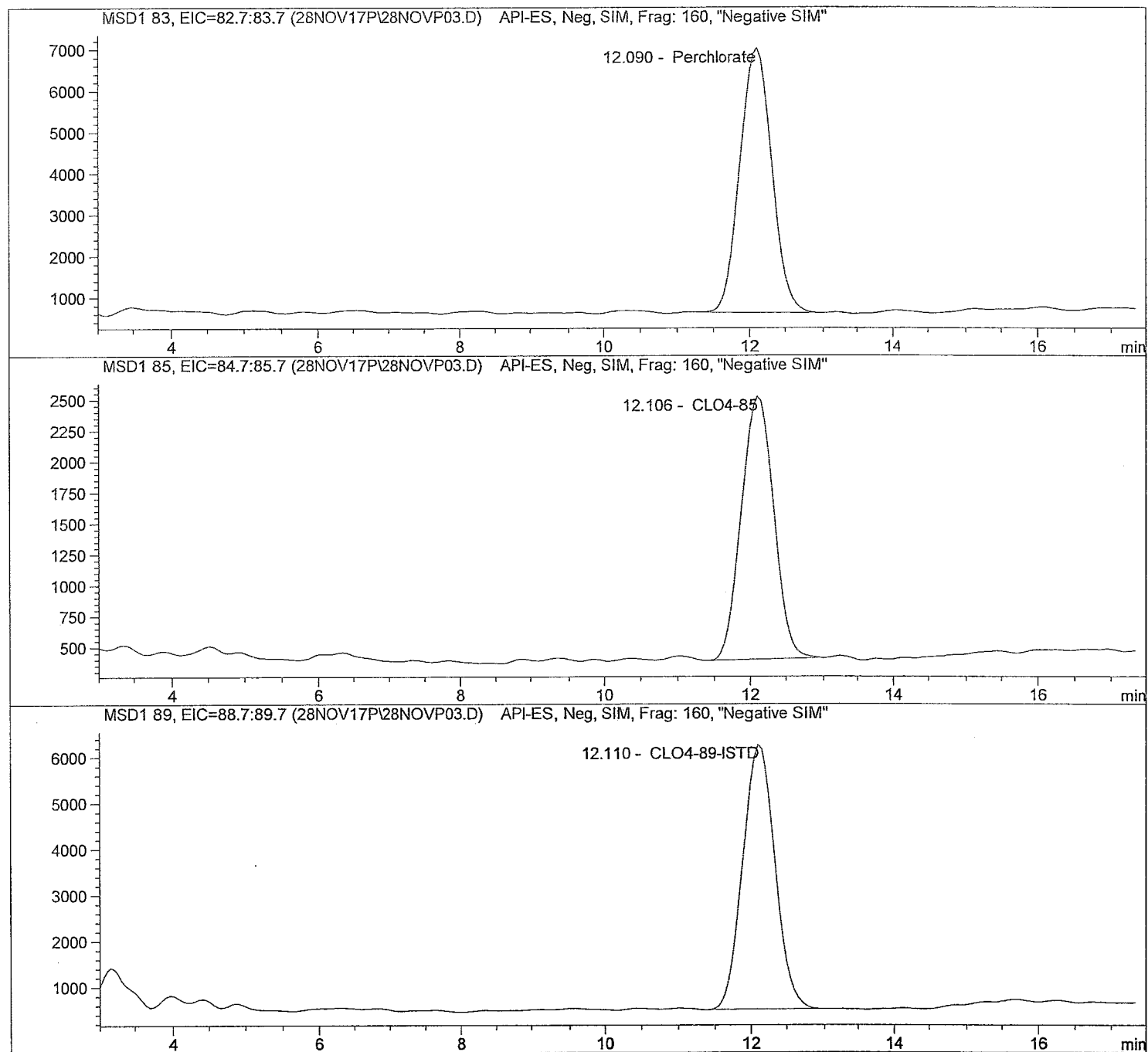
Injection Date:	11/28/2017 09:53:00	Seq Line:	3
Sample Name:	ICAL3@ 5.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP03.D

Sample Name: ICAL3@ 5.0ug/L

```
=====
Injection Date: 11/28/2017 09:53:00      Seq Line: 3
Sample Name: ICAL3@ 5.0ug/L              Location: Vial 73
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.090	BBA	192984.6	5.0058	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.106	PBA	65132.3	5.0510	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.110	PBA	175128.5	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP04.D

Sample Name: ICAL4@ 10.ug/L

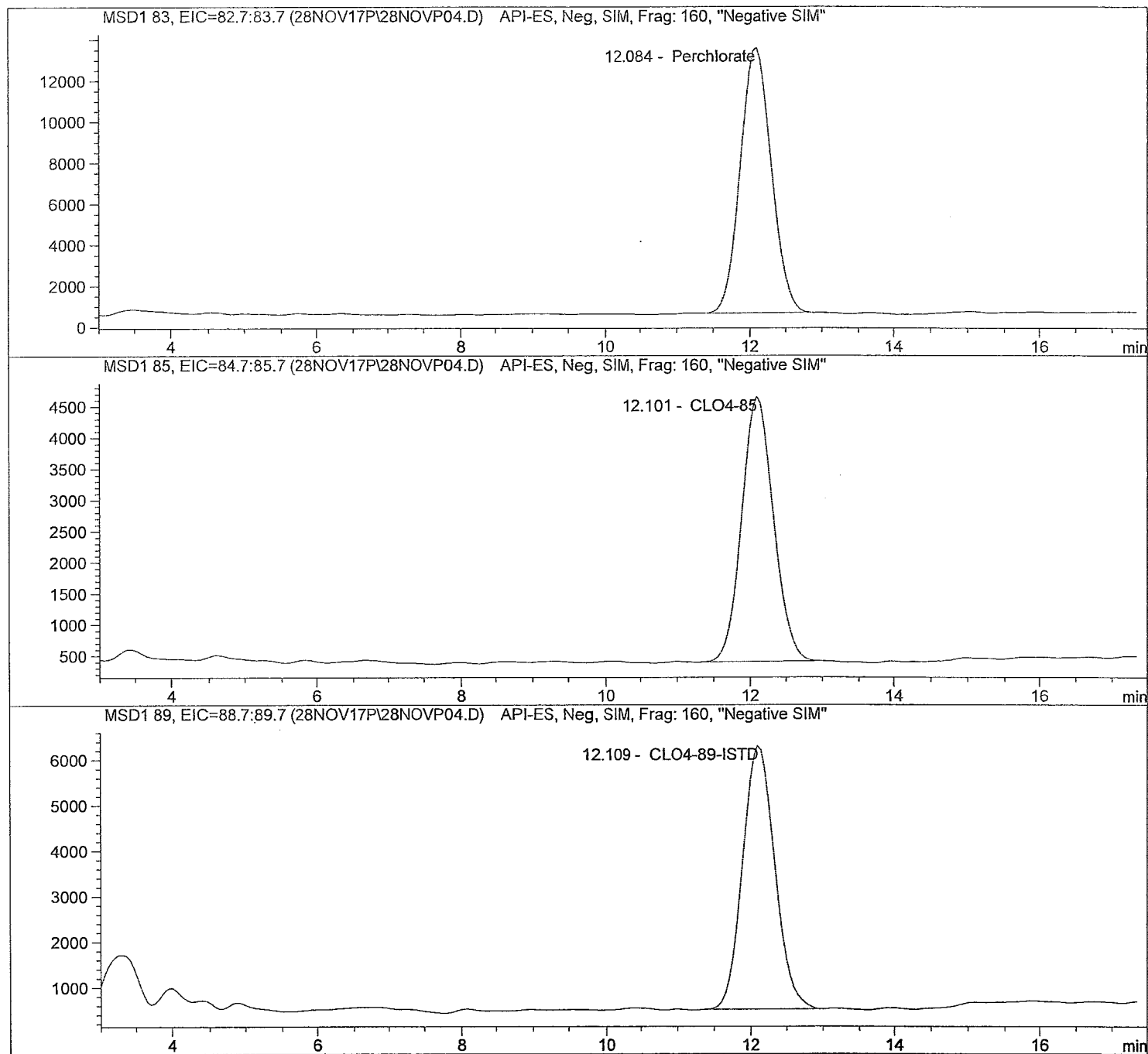
Injection Date:	11/28/2017 10:12:13	Seq Line:	4
Sample Name:	ICAL4@ 10.ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP04.D

Sample Name: ICAL4@ 10.ug/L

Injection Date:	11/28/2017 10:12:13	Seq Line:	4
Sample Name:	ICAL4@ 10.ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT	Type	Area	Amount	Compound
[min]			[ug/sample]	Name
12.084	BBA	391582.9	9.5789	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT	Type	Area	Amount	Compound
[min]			[ug/sample]	Name
12.101	PBA	131324.7	9.8568	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT	Type	Area	Amount	Compound
[min]			[ug/sample]	Name
12.109	PBA	180962.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP05.D

Sample Name: ICAL5@ 25.ug/L

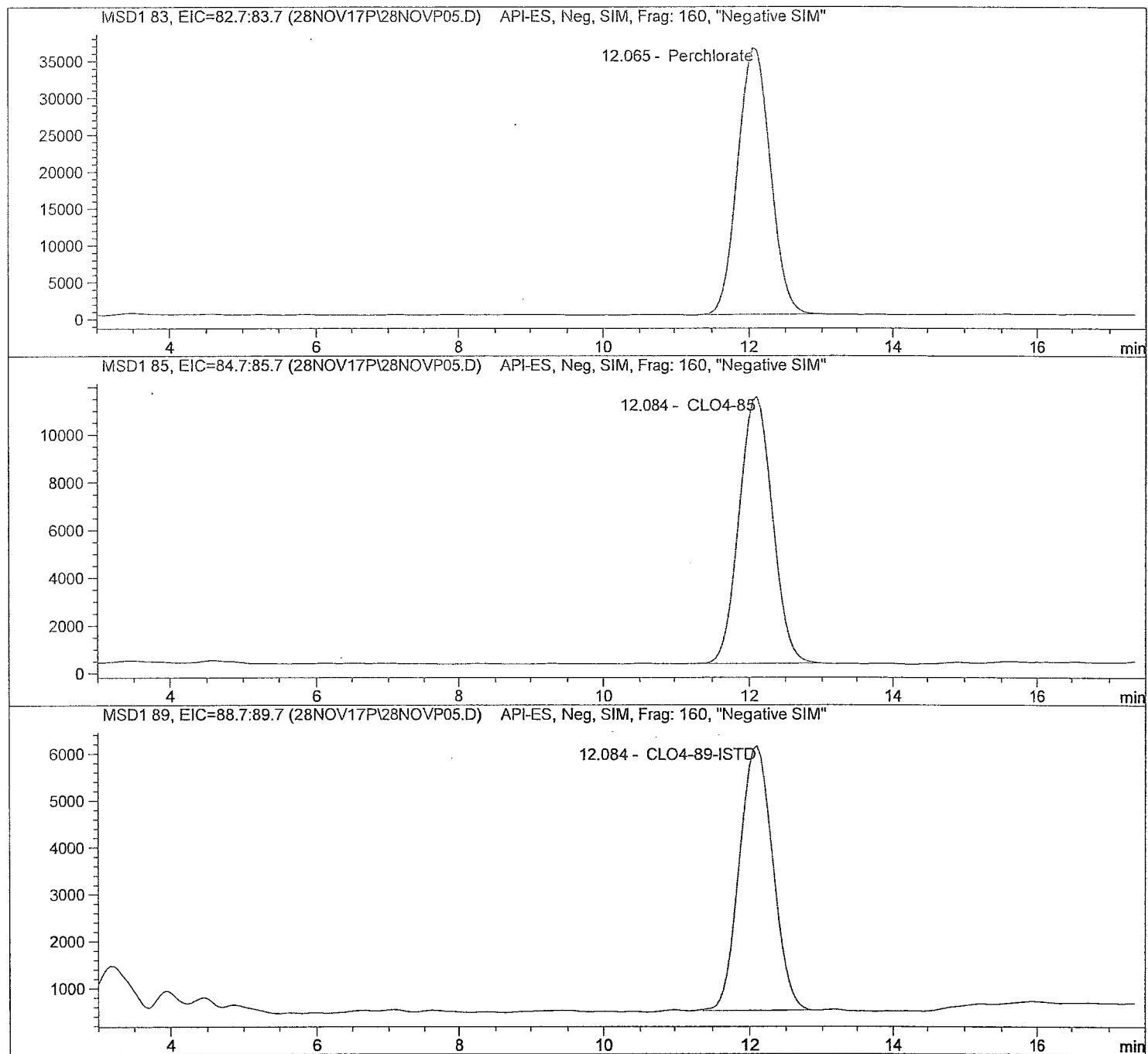
Injection Date:	11/28/2017 10:31:23	Seq Line:	5
Sample Name:	ICAL5@ 25.ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP05.D

Sample Name: ICAL5@ 25.ug/L

```
=====
Injection Date: 11/28/2017 10:31:23      Seq Line: 5
Sample Name: ICAL5@ 25.ug/L             Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
=====
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.065	PBA	1097625.1	25.5523	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.084	PBA	346912.7	25.5843	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.084	BBA	175597.1	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

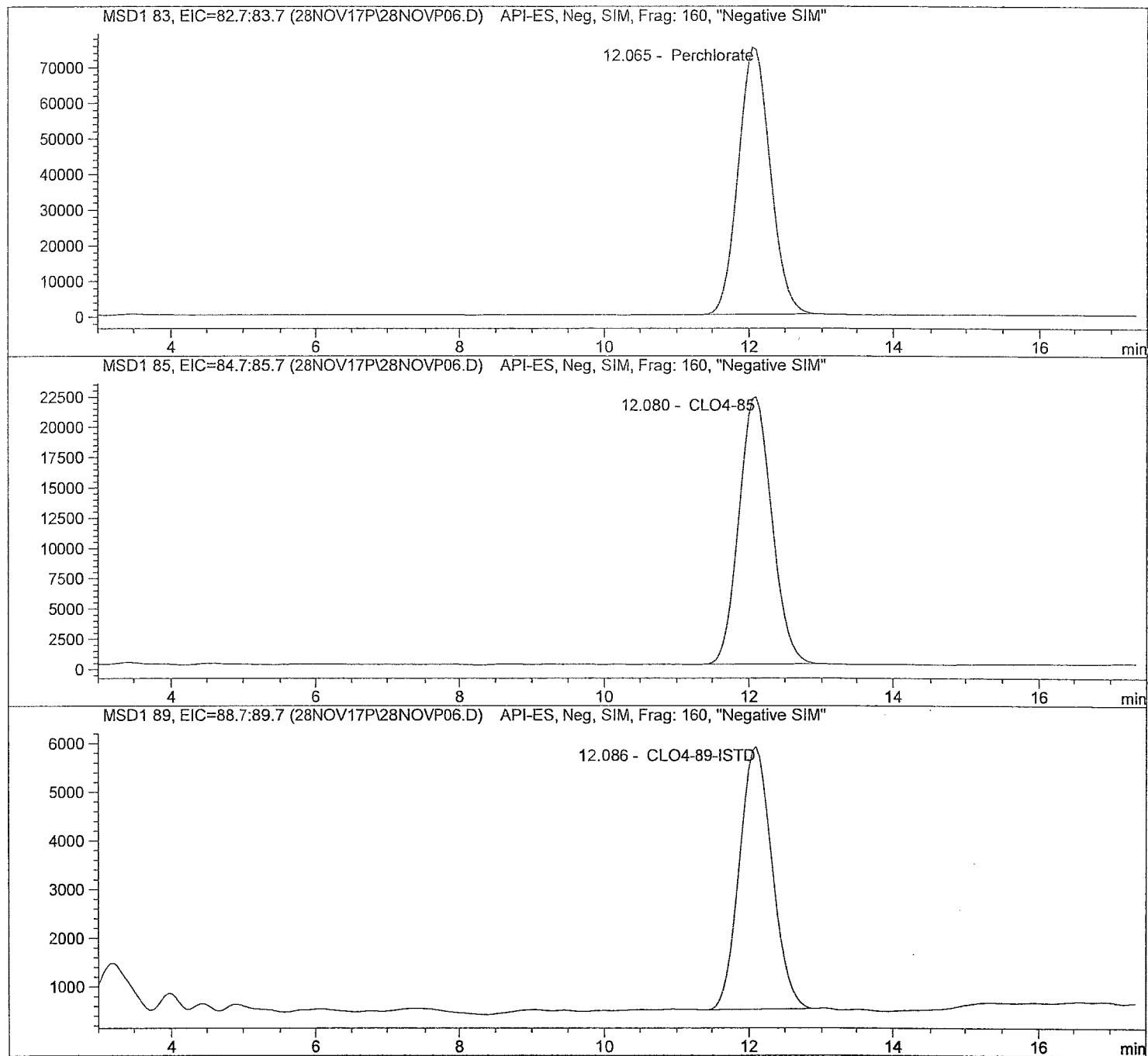
Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP06.D

Sample Name: ICAL6@ 50.ug/L

Injection Date:	11/28/2017 10:50:33	Seq Line:	6
Sample Name:	ICAL6@ 50.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP06.D

Sample Name: ICAL6@ 50.ug/L

Injection Date:	11/28/2017 10:50:33	Seq Line:	6
Sample Name:	ICAL6@ 50.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT	Type	Area	Amount	Compound
[min]			[ug/sample]	Name
12.065	BBA	2298336.2	49.8316	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT	Type	Area	Amount	Compound
[min]			[ug/sample]	Name
12.080	PBA	696155.7	49.1828	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT	Type	Area	Amount	Compound
[min]			[ug/sample]	Name
12.086	PBA	169148.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP07.D

Sample Name: ICAL7@ 75.ug/L

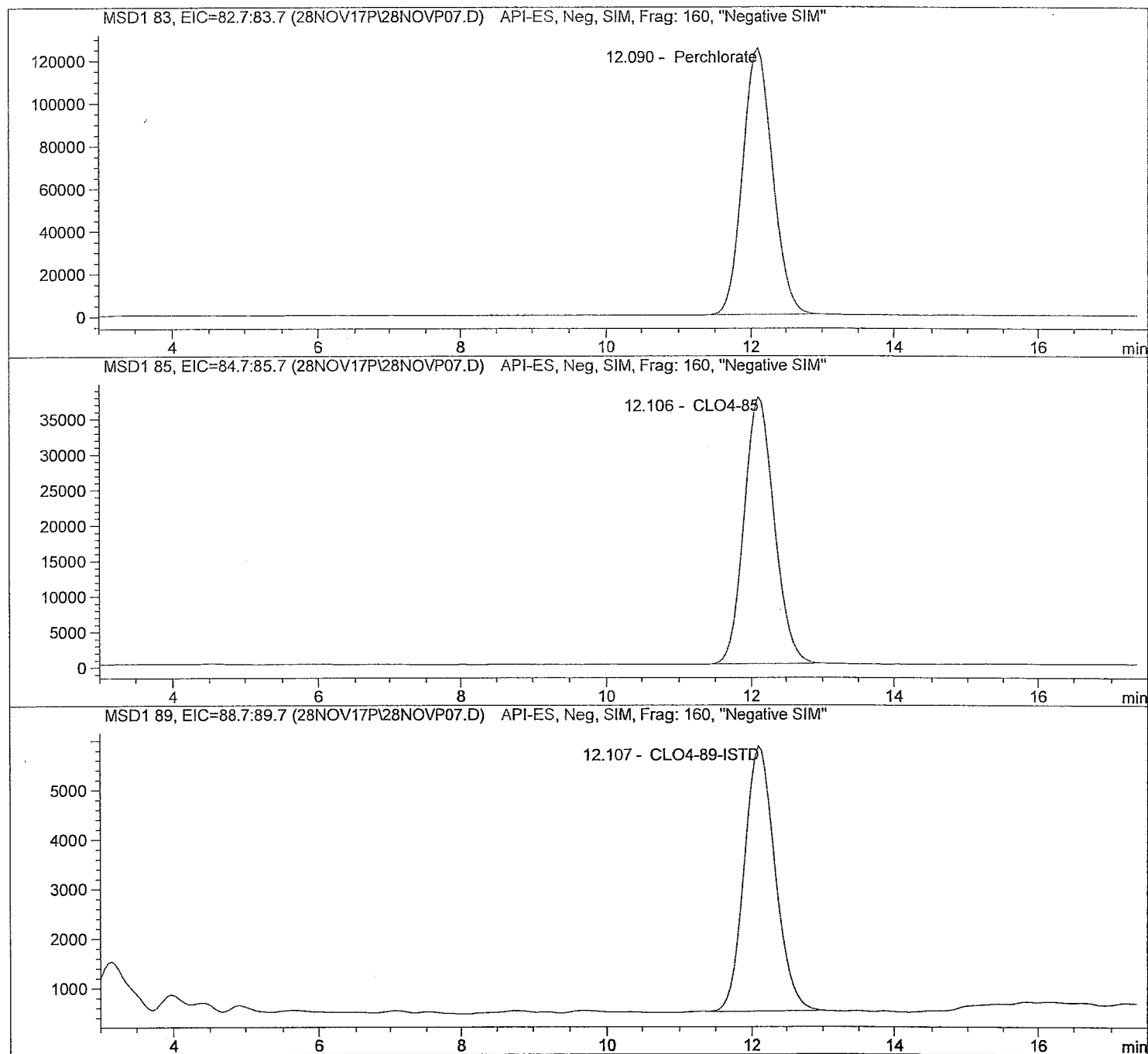
Injection Date:	11/28/2017 11:09:43	Seq Line:	7
Sample Name:	ICAL7@ 75.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP07.D

Sample Name: ICAL7@ 75.ug/L

```

=====
Injection Date: 11/28/2017 11:09:43      Seq Line: 7
Sample Name:    ICAL7@ 75.ug/L          Location: Vial 77
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====

```

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017, 08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  75.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.090	PBA	3730211.3	74.9999	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.106	PBA	1130772.0	75.3391	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.107	BBA	164866.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP08.D

Sample Name: ICAL Verf@10ug/L

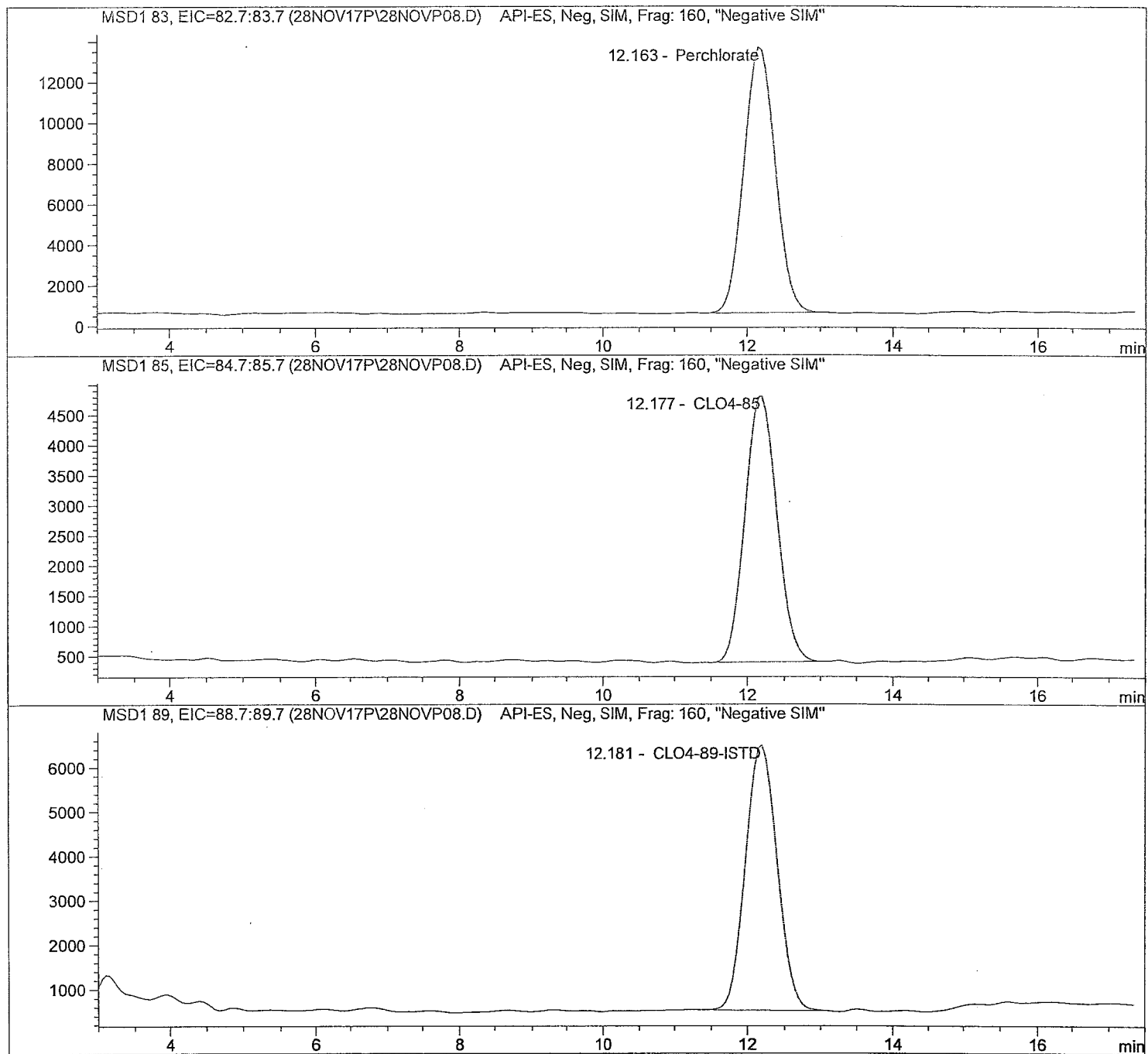
Injection Date:	11/28/2017 11:28:53	Seq Line:	8
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP08.D

Sample Name: ICAL Verf@10ug/L

```
=====
Injection Date: 11/28/2017 11:28:53      Seq Line: 8
Sample Name:    ICAL Verf@10ug/L         Location: Vial 78
Acq Operator:   TNB                      Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.163	PBA	383615.2	9.5953	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.177	PBA	131459.5	10.0855	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.181	BBA	176961.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

Injection Date: 11/28/2017 09:08:10

Seq Line: 1

Sample Name: ICAL1@ 1.0ug/L

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

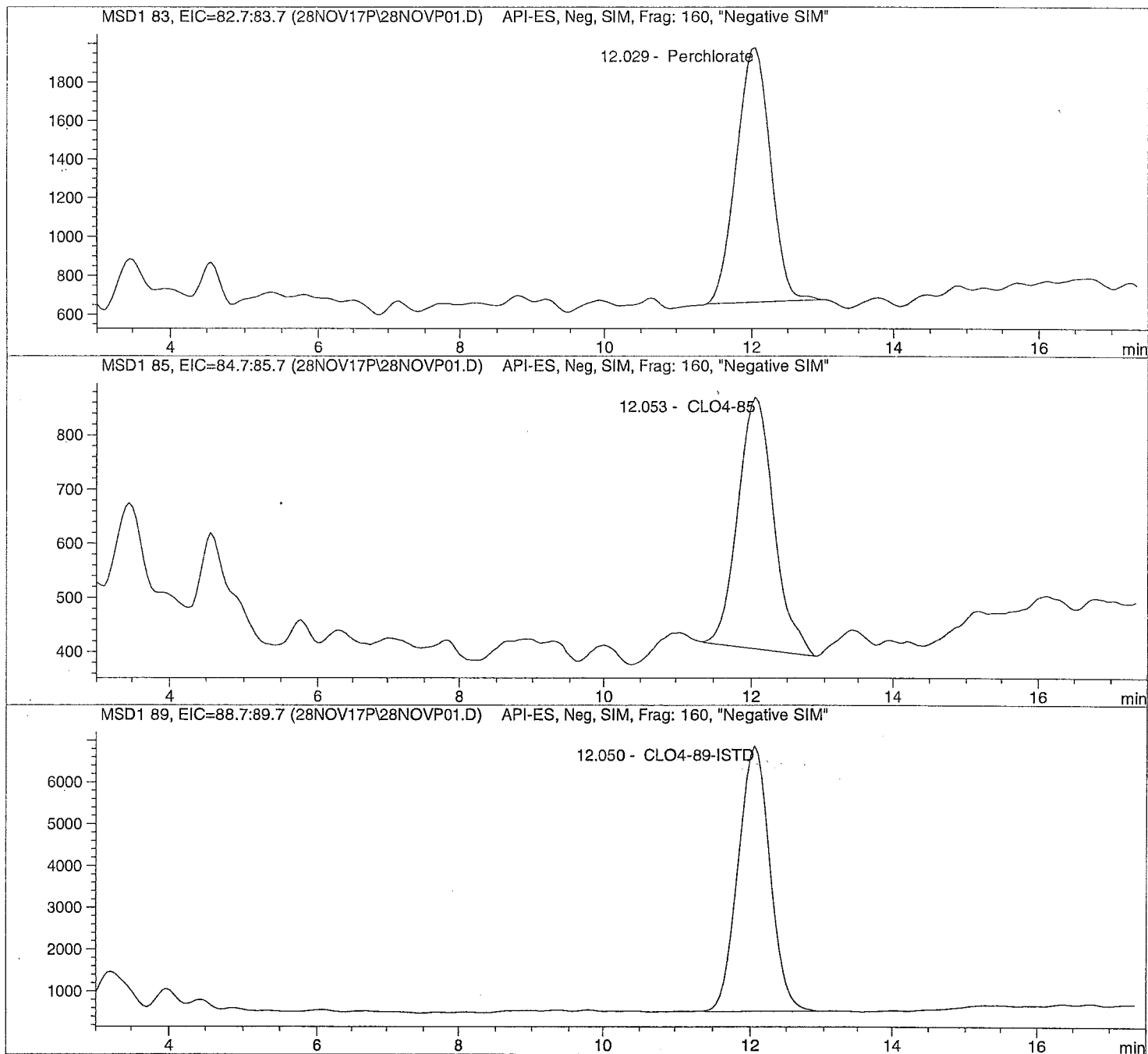
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

```

=====
Injection Date: 11/28/2017 09:08:10      Seq Line: 1
Sample Name: ICAL1@ 1.0ug/L      Location: Vial 71
Acq Operator: TNB      Inj. No.: 1
                               Inj. Vol.: 25 µl
=====

```

```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.029	BBA	42017.4	1.0510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.053	BBA	15678.7	0.9871	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.050	BBA	188880.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

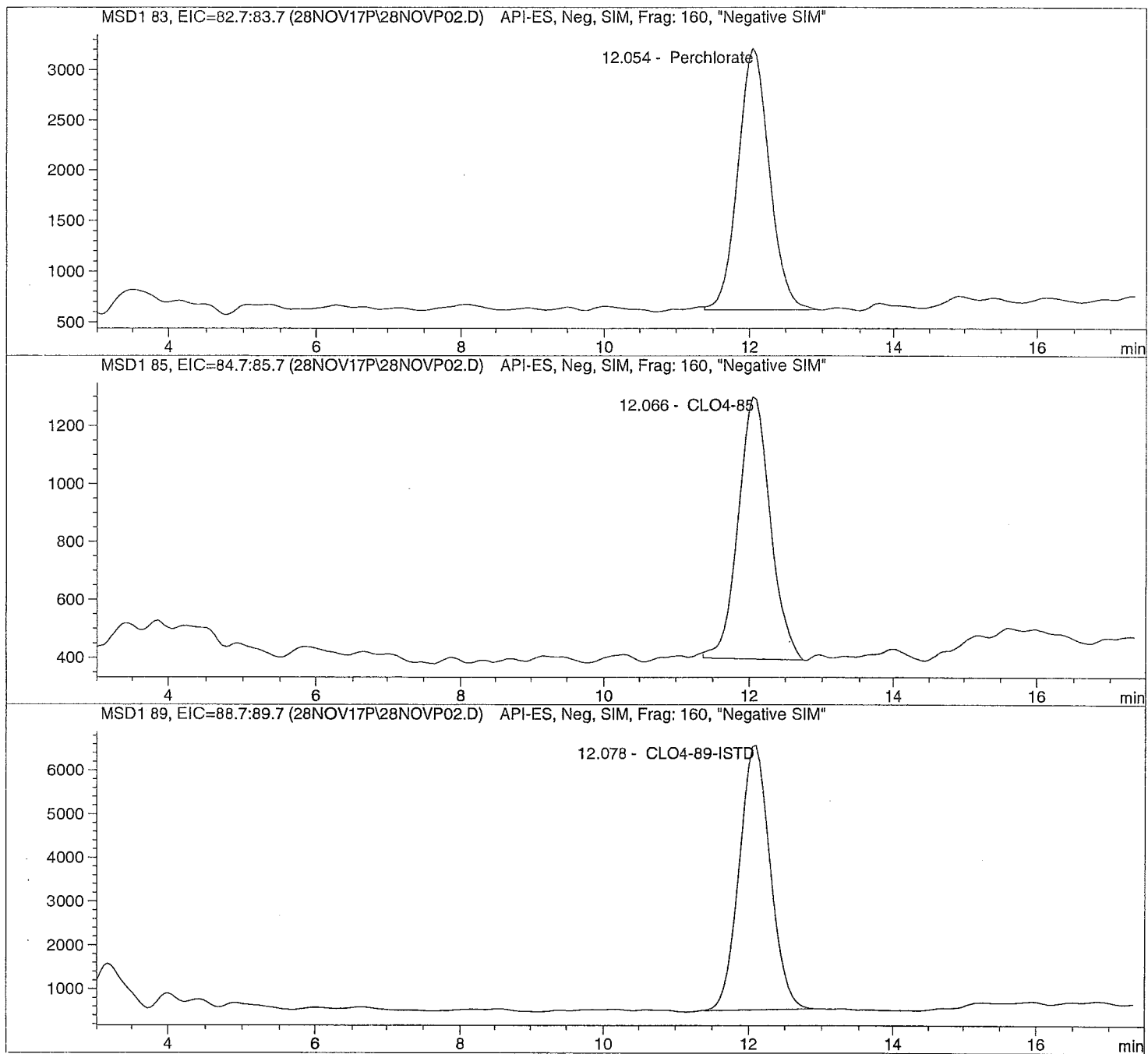
=====

Injection Date:	11/28/2017 09:33:49	Seq Line:	2
Sample Name:	ICAL2@ 2.0ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



```
=====
Injection Date: 11/28/2017 09:33:49      Seq Line: 2
Sample Name: ICAL2@ 2.0ug/L              Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

```
=====
Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017, 08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 2.000

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.054	BBA	78519.1	2.0151	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.066	BBA	28009.6	2.0074	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.078	PBA	181109.4	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Injection Date: 11/29/2017 09:06:18

Seq Line: 3

Sample Name: 576092 ICS01.

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

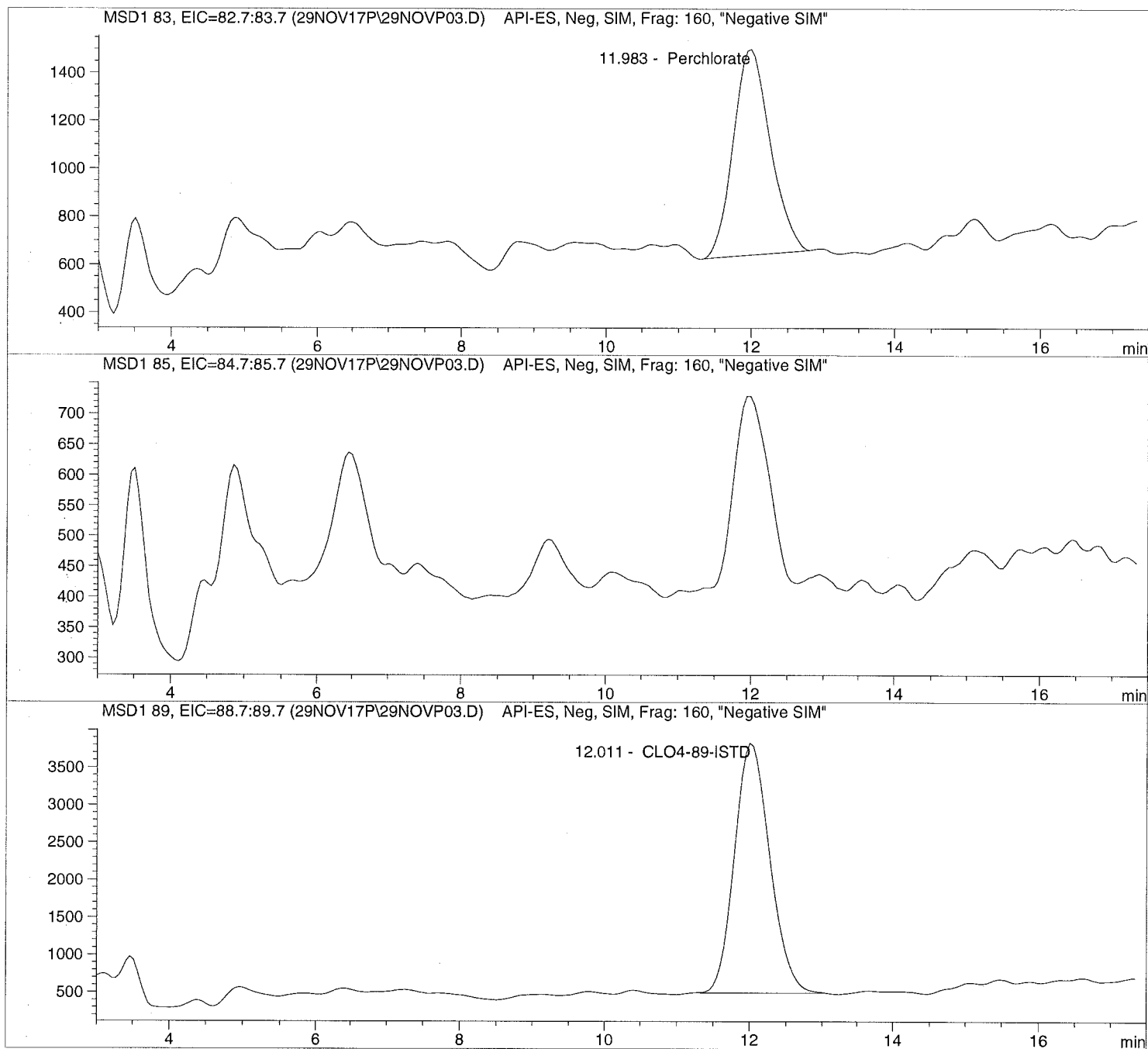
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



```
=====
Injection Date: 11/29/2017 09:06:18      Seq Line: 3
Sample Name: 576092 ICS@1.              Location: Vial 73
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

```
=====
                          Sample Information
=====
```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017, 08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
11.983	PBA	30186.6	1.2677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.011	BBA	111922.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

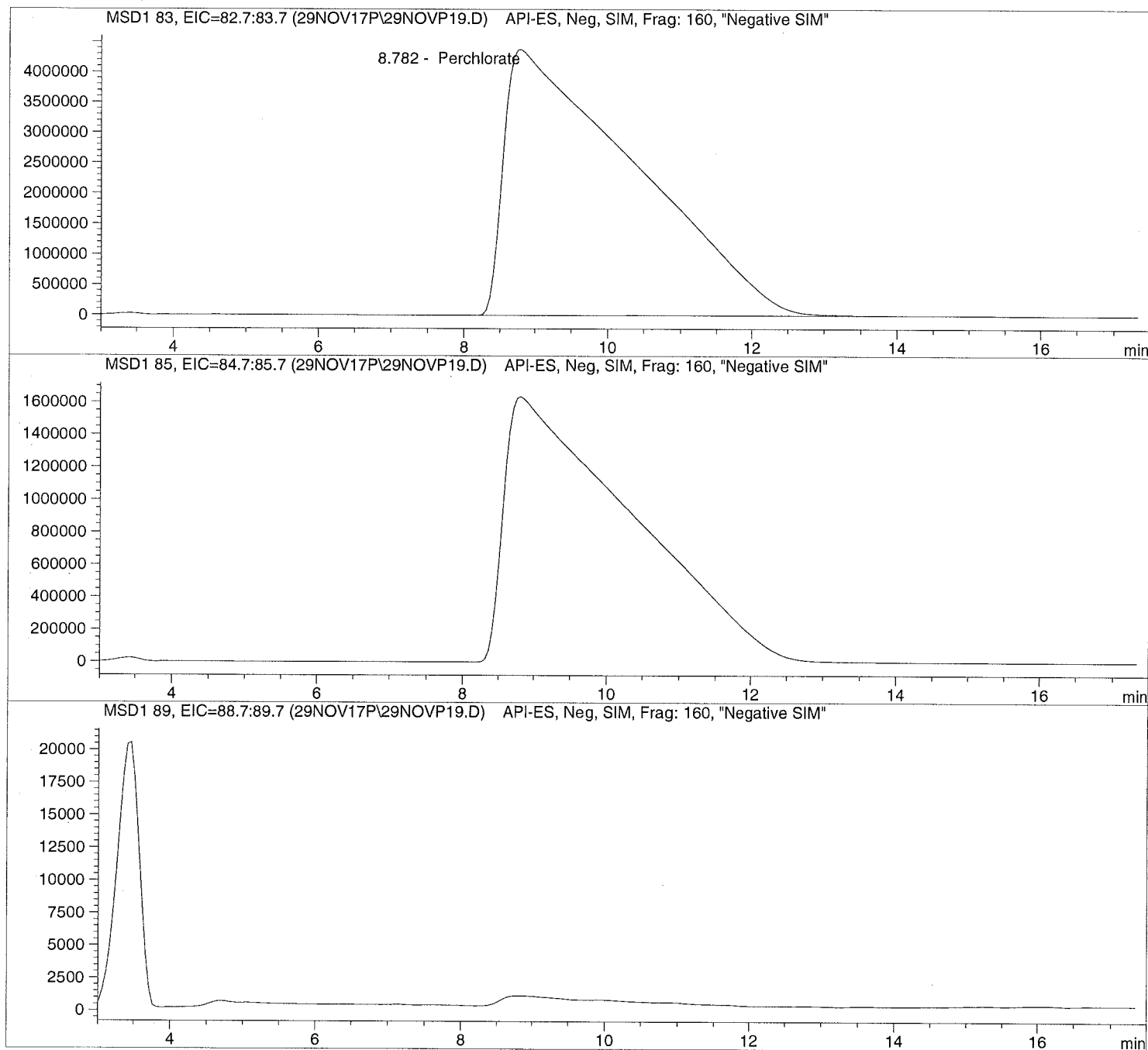

=====

Injection Date:	11/29/2017 14:13:01	Seq Line:	19
Sample Name:	1732092002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis



=====

Injection Date:	11/29/2017 14:13:01	Seq Line:	19
Sample Name:	1732092002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 11/29/2017 08:03:05

Perchlorate analysis

=====

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

=====

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.782	PBA	555201408.0	0.0243	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

=====

*** End of Report ***



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December 20, 2017

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS17110944**

Revision: **1**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 20 sample(s) on Nov 17, 2017 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: Jumoke.Lawal
Sonia West
Project Manager

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS17110944

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS17110944-01	17TB02-111517	Water	17TB02-111517	15-Nov-2017 10:00	17-Nov-2017 08:30	☐
HS17110944-02	17WW18-111517	Groundwater		15-Nov-2017 11:45	17-Nov-2017 08:30	☐
HS17110944-03	17WW01-111517	Groundwater		15-Nov-2017 13:35	17-Nov-2017 08:30	☐
HS17110944-04	17WW17-111517	Groundwater		15-Nov-2017 14:20	17-Nov-2017 08:30	☐
HS17110944-05	17WW17-111517-FD	Groundwater		15-Nov-2017 14:20	17-Nov-2017 08:30	☐
HS17110944-06	17WW02-111517	Groundwater		15-Nov-2017 15:15	17-Nov-2017 08:30	☐
HS17110944-07	17WW02-111517-FD	Groundwater		15-Nov-2017 15:15	17-Nov-2017 08:30	☐
HS17110944-08	17WW10-111517	Groundwater		15-Nov-2017 16:20	17-Nov-2017 08:30	☐
HS17110944-09	17WW09-111517	Groundwater		15-Nov-2017 17:05	17-Nov-2017 08:30	☐
HS17110944-10	18WW14-111617	Groundwater		16-Nov-2017 09:55	17-Nov-2017 08:30	☐
HS17110944-11	18WW15-111617	Groundwater	17TB03-111517	16-Nov-2017 10:45	17-Nov-2017 08:30	☐
HS17110944-12	17WW11-111617	Groundwater		16-Nov-2017 11:35	17-Nov-2017 08:30	☐
HS17110944-13	17WW06-111617	Groundwater		16-Nov-2017 12:35	17-Nov-2017 08:30	☐
HS17110944-14	17TB03-111517	Water		15-Nov-2017 10:05	17-Nov-2017 08:30	☐
HS17110944-15	18WW10-111517	Groundwater		15-Nov-2017 12:05	17-Nov-2017 08:30	☐
HS17110944-16	17WW14-111517	Groundwater		15-Nov-2017 14:25	17-Nov-2017 08:30	☐
HS17110944-17	17WW15-111517	Groundwater		15-Nov-2017 15:55	17-Nov-2017 08:30	☐
HS17110944-18	17WW16-111517	Groundwater		15-Nov-2017 17:30	17-Nov-2017 08:30	☐
HS17110944-19	17WW04-111617	Groundwater		16-Nov-2017 10:35	17-Nov-2017 08:30	☐
HS17110944-20	17WW05-111617	Groundwater		16-Nov-2017 11:55	17-Nov-2017 08:30	☐

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS17110944

CASE NARRATIVE

Work Order Comments

- Sample 17WW10-111617 container label collection time (17:05) does not match the chain of custody collection time of 16:20. Sample 17WW09-111517 container label collection time (16:20) does not match the chain of custody collection time of 17:05. This information is reported from the chain of custody.

Work Order Comments

- Report revised on December 20,2017 to change sample ID 17WW12-111617 TO 17WW11-111617 (ALS HS17110944-12)

GCMS Volatiles by Method SW8260

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

Batch ID: R305807**Sample ID: 17WW01-111517 (HS17110944-03MS)**

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: 17WW01-111517 (HS17110944-03MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.
- The RPD between the MS and MSD was outside of the control limit.

Batch ID: R305927**Sample ID: HS17111049-04MS**

- MS and MSD are for an unrelated sample
-

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB02-111517
 Collection Date: 15-Nov-2017 10:00

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 11:58
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 11:58
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 11:58
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 11:58
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 11:58
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB02-111517
 Collection Date: 15-Nov-2017 10:00

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 11:58
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 11:58
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 11:58
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 11:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 11:58
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.0</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 11:58</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.7</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 11:58</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.4</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 11:58</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 11:58</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW18-111517
 Collection Date: 15-Nov-2017 11:45

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 12:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 12:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 12:22
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 12:22
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 12:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW18-111517
 Collection Date: 15-Nov-2017 11:45

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 12:22
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 12:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:22
<i>Surr: 1,2-Dichloroethane-d4</i>	92.4			0	70-126	%REC	1	20-Nov-2017 12:22
<i>Surr: 4-Bromofluorobenzene</i>	98.9			0	81-113	%REC	1	20-Nov-2017 12:22
<i>Surr: Dibromofluoromethane</i>	93.7			0	77-123	%REC	1	20-Nov-2017 12:22
<i>Surr: Toluene-d8</i>	99.2			0	82-127	%REC	1	20-Nov-2017 12:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW01-111517
 Collection Date: 15-Nov-2017 13:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1,2-Trichlor-1,2,2-trifluoroethane	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1,2-Trichloroethane	11		3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1-Dichloroethane	98		2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1-Dichloroethene	240		2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,1-Dichloropropene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2-Dibromo-3-chloropropane	5.0	U	10	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2-Dibromoethane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2-Dichloroethane	87		2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,2-Dichloropropane	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,3-Dichloropropane	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
2,2-Dichloropropane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
2-Butanone	10	U	5.0	10	20	ug/L	10	20-Nov-2017 15:16
2-Chlorotoluene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
2-Hexanone	10	U	10	10	20	ug/L	10	20-Nov-2017 15:16
4-Chlorotoluene	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
4-Isopropyltoluene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
4-Methyl-2-pentanone	100	U	7.0	100	20	ug/L	10	20-Nov-2017 15:16
Acetone	10	U	20	10	20	ug/L	10	20-Nov-2017 15:16
Benzene	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Bromobenzene	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Bromochloromethane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Bromodichloromethane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Bromoform	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Bromomethane	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Carbon disulfide	10	U	6.0	10	20	ug/L	10	20-Nov-2017 15:16
Carbon tetrachloride	5.0	U	5.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Chlorobenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW01-111517
 Collection Date: 15-Nov-2017 13:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-03
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
Chloroethane	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Chloroform	18		2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Chloromethane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
cis-1,2-Dichloroethene	3,700		20	50	100	ug/L	100	20-Nov-2017 14:27
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Dibromochloromethane	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Dibromomethane	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Ethylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Hexachlorobutadiene	5.0	U	10	5.0	10	ug/L	10	20-Nov-2017 15:16
Isopropylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
m,p-Xylene	10	U	5.0	10	20	ug/L	10	20-Nov-2017 15:16
Methylene chloride	10	U	10	10	20	ug/L	10	20-Nov-2017 15:16
n-Butylbenzene	5.0	U	4.0	5.0	10	ug/L	10	20-Nov-2017 15:16
n-Propylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Naphthalene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
o-Xylene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
sec-Butylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Styrene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
tert-Butylbenzene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Tetrachloroethene	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Toluene	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
trans-1,2-Dichloroethene	78		2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Trichloroethene	6,100		20	50	100	ug/L	100	20-Nov-2017 14:27
Trichlorofluoromethane	5.0	U	3.0	5.0	10	ug/L	10	20-Nov-2017 15:16
Vinyl chloride	4.0	J	2.0	5.0	10	ug/L	10	20-Nov-2017 15:16
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.5</i>			0	<i>70-126</i>	%REC	<i>10</i>	<i>20-Nov-2017 15:16</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.2</i>			0	<i>70-126</i>	%REC	<i>100</i>	<i>20-Nov-2017 14:27</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.9</i>			0	<i>81-113</i>	%REC	<i>100</i>	<i>20-Nov-2017 14:27</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>81-113</i>	%REC	<i>10</i>	<i>20-Nov-2017 15:16</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.7</i>			0	<i>77-123</i>	%REC	<i>10</i>	<i>20-Nov-2017 15:16</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.2</i>			0	<i>77-123</i>	%REC	<i>100</i>	<i>20-Nov-2017 14:27</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>82-127</i>	%REC	<i>10</i>	<i>20-Nov-2017 15:16</i>
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>82-127</i>	%REC	<i>100</i>	<i>20-Nov-2017 14:27</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW17-111517
 Collection Date: 15-Nov-2017 14:20

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 12:47
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 12:47
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 12:47
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 12:47
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 12:47
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW17-111517
 Collection Date: 15-Nov-2017 14:20

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-04
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
cis-1,2-Dichloroethene	1.9		0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 12:47
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 12:47
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 12:47
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 12:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 12:47
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.2</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 12:47</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.4</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 12:47</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.2</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 12:47</i>
<i>Surr: Toluene-d8</i>	<i>99.2</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 12:47</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW17-111517-FD
 Collection Date: 15-Nov-2017 14:20

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 13:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 13:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 13:12
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 13:12
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 13:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW17-111517-FD
 Collection Date: 15-Nov-2017 14:20

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-05
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
cis-1,2-Dichloroethene	1.9		0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 13:12
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 13:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:12
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.2</i>			0	<i>70-126</i>	%REC	1	20-Nov-2017 13:12
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>81-113</i>	%REC	1	20-Nov-2017 13:12
<i>Surr: Dibromofluoromethane</i>	<i>94.8</i>			0	<i>77-123</i>	%REC	1	20-Nov-2017 13:12
<i>Surr: Toluene-d8</i>	<i>99.7</i>			0	<i>82-127</i>	%REC	1	20-Nov-2017 13:12
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW02-111517
 Collection Date: 15-Nov-2017 15:15

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2-Dichloroethane	3.3		0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 13:37
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 13:37
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW02-111517
 Collection Date: 15-Nov-2017 15:15

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-06
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
cis-1,2-Dichloroethene	2.5		0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 13:37
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 13:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 13:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Trichloroethene	6.2		0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 13:37
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>94.6</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 13:37</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 13:37</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.0</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 13:37</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 13:37</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW02-111517-FD
 Collection Date: 15-Nov-2017 15:15

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2-Dichloroethane	3.8		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 14:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 14:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 14:02
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 14:02
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 14:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW02-111517-FD
 Collection Date: 15-Nov-2017 15:15

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-07
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
cis-1,2-Dichloroethene	2.7		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 14:02
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 14:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Trichloroethene	7.4		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:02
<i>Surr: 1,2-Dichloroethane-d4</i>	93.9			0	70-126	%REC	1	20-Nov-2017 14:02
<i>Surr: 4-Bromofluorobenzene</i>	98.7			0	81-113	%REC	1	20-Nov-2017 14:02
<i>Surr: Dibromofluoromethane</i>	93.8			0	77-123	%REC	1	20-Nov-2017 14:02
<i>Surr: Toluene-d8</i>	99.3			0	82-127	%REC	1	20-Nov-2017 14:02
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW10-111517
 Collection Date: 15-Nov-2017 16:20

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 17:45
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 17:45
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 17:45
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 17:45
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 17:45
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW10-111517
 Collection Date: 15-Nov-2017 16:20

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-08
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 17:45
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 17:45
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:45
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:45
Surr: 1,2-Dichloroethane-d4	92.2			0	70-126	%REC	1	20-Nov-2017 17:45
Surr: 4-Bromofluorobenzene	98.2			0	81-113	%REC	1	20-Nov-2017 17:45
Surr: Dibromofluoromethane	94.4			0	77-123	%REC	1	20-Nov-2017 17:45
Surr: Toluene-d8	99.7			0	82-127	%REC	1	20-Nov-2017 17:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW09-111517
 Collection Date: 15-Nov-2017 17:05

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-09
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 18:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 18:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 18:10
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 18:10
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 18:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW09-111517
 Collection Date: 15-Nov-2017 17:05

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-09
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 18:10
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 18:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:10
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>93.1</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>20-Nov-2017 18:10</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.6</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>20-Nov-2017 18:10</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.7</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>20-Nov-2017 18:10</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>20-Nov-2017 18:10</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18WW14-111617
 Collection Date: 16-Nov-2017 09:55

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-10
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 18:35
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 18:35
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 18:35
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 18:35
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 18:35
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18WW14-111617
 Collection Date: 16-Nov-2017 09:55

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-10
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 18:35
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 18:35
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 18:35
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 18:35
Surr: 1,2-Dichloroethane-d4	92.9			0	70-126	%REC	1	20-Nov-2017 18:35
Surr: 4-Bromofluorobenzene	100			0	81-113	%REC	1	20-Nov-2017 18:35
Surr: Dibromofluoromethane	95.0			0	77-123	%REC	1	20-Nov-2017 18:35
Surr: Toluene-d8	100			0	82-127	%REC	1	20-Nov-2017 18:35
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18WW15-111617
 Collection Date: 16-Nov-2017 10:45

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-11
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 19:00
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 19:00
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 19:00
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 19:00
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 19:00
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18WW15-111617
 Collection Date: 16-Nov-2017 10:45

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-11
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 19:00
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 19:00
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:00
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:00
Surr: 1,2-Dichloroethane-d4	92.6			0	70-126	%REC	1	20-Nov-2017 19:00
Surr: 4-Bromofluorobenzene	99.1			0	81-113	%REC	1	20-Nov-2017 19:00
Surr: Dibromofluoromethane	93.1			0	77-123	%REC	1	20-Nov-2017 19:00
Surr: Toluene-d8	99.0			0	82-127	%REC	1	20-Nov-2017 19:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW11-111617
 Collection Date: 16-Nov-2017 11:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-12
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 19:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 19:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 19:25
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 19:25
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 19:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW11-111617
 Collection Date: 16-Nov-2017 11:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-12
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 19:25
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 19:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:25
Surr: 1,2-Dichloroethane-d4	93.0			0	70-126	%REC	1	20-Nov-2017 19:25
Surr: 4-Bromofluorobenzene	99.3			0	81-113	%REC	1	20-Nov-2017 19:25
Surr: Dibromofluoromethane	92.8			0	77-123	%REC	1	20-Nov-2017 19:25
Surr: Toluene-d8	100			0	82-127	%REC	1	20-Nov-2017 19:25
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW06-111617
 Collection Date: 16-Nov-2017 12:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-13
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1-Dichloroethane	1.2		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1-Dichloroethene	7.6		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2-Dichloroethane	8.4		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 14:52
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 14:52
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 14:52
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 14:52
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 14:52
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW06-111617
 Collection Date: 16-Nov-2017 12:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-13
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
cis-1,2-Dichloroethene	9.4		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 14:52
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 14:52
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 14:52
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
trans-1,2-Dichloroethene	2.8		0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Trichloroethene	260		2.0	5.0	10	ug/L	10	20-Nov-2017 16:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 14:52
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 14:52
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.7</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>20-Nov-2017 14:52</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.8</i>			0	<i>70-126</i>	%REC	<i>10</i>	<i>20-Nov-2017 16:31</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.3</i>			0	<i>81-113</i>	%REC	<i>10</i>	<i>20-Nov-2017 16:31</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>97.2</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>20-Nov-2017 14:52</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.8</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>20-Nov-2017 14:52</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.2</i>			0	<i>77-123</i>	%REC	<i>10</i>	<i>20-Nov-2017 16:31</i>
<i>Surr: Toluene-d8</i>	<i>99.5</i>			0	<i>82-127</i>	%REC	<i>10</i>	<i>20-Nov-2017 16:31</i>
<i>Surr: Toluene-d8</i>	<i>98.9</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>20-Nov-2017 14:52</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB03-111517
 Collection Date: 15-Nov-2017 10:05

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-14
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 17:20
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 17:20
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 17:20
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 17:20
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 17:20
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB03-111517
 Collection Date: 15-Nov-2017 10:05

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-14
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: PC	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 17:20
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 17:20
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 17:20
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 17:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 17:20
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.7</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 17:20</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.4</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 17:20</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.7</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 17:20</i>
<i>Surr: Toluene-d8</i>	<i>99.8</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 17:20</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18WW10-111517
 Collection Date: 15-Nov-2017 12:05

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-15
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 19:50
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 19:50
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 19:50
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 19:50
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 19:50
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18WW10-111517
 Collection Date: 15-Nov-2017 12:05

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-15
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 19:50
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 19:50
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 19:50
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 19:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 19:50
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.9</i>			0	<i>70-126</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 19:50</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.4</i>			0	<i>81-113</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 19:50</i>
<i>Surr: Dibromofluoromethane</i>	<i>93.1</i>			0	<i>77-123</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 19:50</i>
<i>Surr: Toluene-d8</i>	<i>99.3</i>			0	<i>82-127</i>	<i>%REC</i>	<i>1</i>	<i>20-Nov-2017 19:50</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW14-111517
 Collection Date: 15-Nov-2017 14:25

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-16
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 20:15
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 20:15
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 20:15
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 20:15
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 20:15
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW14-111517
 Collection Date: 15-Nov-2017 14:25

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-16
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 20:15
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 20:15
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:15
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:15
Surr: 1,2-Dichloroethane-d4	96.1			0	70-126	%REC	1	20-Nov-2017 20:15
Surr: 4-Bromofluorobenzene	99.6			0	81-113	%REC	1	20-Nov-2017 20:15
Surr: Dibromofluoromethane	95.9			0	77-123	%REC	1	20-Nov-2017 20:15
Surr: Toluene-d8	101			0	82-127	%REC	1	20-Nov-2017 20:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW15-111517
 Collection Date: 15-Nov-2017 15:55

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-17
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 20:40
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 20:40
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	20-Nov-2017 20:40
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	20-Nov-2017 20:40
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	20-Nov-2017 20:40
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW15-111517
 Collection Date: 15-Nov-2017 15:55

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-17
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	20-Nov-2017 20:40
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	20-Nov-2017 20:40
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	20-Nov-2017 20:40
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	20-Nov-2017 20:40
Surr: 1,2-Dichloroethane-d4	93.9			0	70-126	%REC	1	20-Nov-2017 20:40
Surr: 4-Bromofluorobenzene	102			0	81-113	%REC	1	20-Nov-2017 20:40
Surr: Dibromofluoromethane	94.4			0	77-123	%REC	1	20-Nov-2017 20:40
Surr: Toluene-d8	102			0	82-127	%REC	1	20-Nov-2017 20:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW16-111517
 Collection Date: 15-Nov-2017 17:30

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-18
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	21-Nov-2017 11:41
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	21-Nov-2017 11:41
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	21-Nov-2017 11:41
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	21-Nov-2017 11:41
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	21-Nov-2017 11:41
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW16-111517
 Collection Date: 15-Nov-2017 17:30

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-18
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	21-Nov-2017 11:41
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	21-Nov-2017 11:41
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 11:41
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 11:41
Surr: 1,2-Dichloroethane-d4	90.7			0	70-126	%REC	1	21-Nov-2017 11:41
Surr: 4-Bromofluorobenzene	98.7			0	81-113	%REC	1	21-Nov-2017 11:41
Surr: Dibromofluoromethane	92.2			0	77-123	%REC	1	21-Nov-2017 11:41
Surr: Toluene-d8	99.7			0	82-127	%REC	1	21-Nov-2017 11:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW04-111617
 Collection Date: 16-Nov-2017 10:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-19
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	21-Nov-2017 12:05
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	21-Nov-2017 12:05
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	21-Nov-2017 12:05
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	21-Nov-2017 12:05
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	21-Nov-2017 12:05
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW04-111617
 Collection Date: 16-Nov-2017 10:35

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-19
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260					Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	21-Nov-2017 12:05
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	21-Nov-2017 12:05
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:05
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:05
Surr: 1,2-Dichloroethane-d4	93.3			0	70-126	%REC	1	21-Nov-2017 12:05
Surr: 4-Bromofluorobenzene	99.1			0	81-113	%REC	1	21-Nov-2017 12:05
Surr: Dibromofluoromethane	94.0			0	77-123	%REC	1	21-Nov-2017 12:05
Surr: Toluene-d8	99.6			0	82-127	%REC	1	21-Nov-2017 12:05
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW05-111617
 Collection Date: 16-Nov-2017 11:55

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-20
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	21-Nov-2017 12:30
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	21-Nov-2017 12:30
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
4-Methyl-2-pentanone	10	U	0.70	10	2.0	ug/L	1	21-Nov-2017 12:30
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	21-Nov-2017 12:30
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	21-Nov-2017 12:30
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW05-111617
 Collection Date: 16-Nov-2017 11:55

ANALYTICAL REPORT

WorkOrder:HS17110944
 Lab ID:HS17110944-20
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: PC
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	21-Nov-2017 12:30
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	21-Nov-2017 12:30
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	21-Nov-2017 12:30
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	21-Nov-2017 12:30
Surr: 1,2-Dichloroethane-d4	92.5			0	70-126	%REC	1	21-Nov-2017 12:30
Surr: 4-Bromofluorobenzene	99.6			0	81-113	%REC	1	21-Nov-2017 12:30
Surr: Dibromofluoromethane	92.6			0	77-123	%REC	1	21-Nov-2017 12:30
Surr: Toluene-d8	99.4			0	82-127	%REC	1	21-Nov-2017 12:30
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	07-Dec-2017 14:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R305807	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Groundwater		
HS17110944-02	17WW18-111517	15 Nov 2017 11:45			20 Nov 2017 12:22	1
HS17110944-03	17WW01-111517	15 Nov 2017 13:35			20 Nov 2017 15:16	10
HS17110944-03	17WW01-111517	15 Nov 2017 13:35			20 Nov 2017 14:27	100
HS17110944-04	17WW17-111517	15 Nov 2017 14:20			20 Nov 2017 12:47	1
HS17110944-05	17WW17-111517-FD	15 Nov 2017 14:20			20 Nov 2017 13:12	1
HS17110944-06	17WW02-111517	15 Nov 2017 15:15			20 Nov 2017 13:37	1
HS17110944-07	17WW02-111517-FD	15 Nov 2017 15:15			20 Nov 2017 14:02	1
HS17110944-08	17WW10-111517	15 Nov 2017 16:20			20 Nov 2017 17:45	1
HS17110944-09	17WW09-111517	15 Nov 2017 17:05			20 Nov 2017 18:10	1
HS17110944-10	18WW14-111617	16 Nov 2017 09:55			20 Nov 2017 18:35	1
HS17110944-11	18WW15-111617	16 Nov 2017 10:45			20 Nov 2017 19:00	1
HS17110944-12	17WW11-111617	16 Nov 2017 11:35			20 Nov 2017 19:25	1
HS17110944-13	17WW06-111617	16 Nov 2017 12:35			20 Nov 2017 16:31	10
HS17110944-13	17WW06-111617	16 Nov 2017 12:35			20 Nov 2017 14:52	1
HS17110944-15	18WW10-111517	15 Nov 2017 12:05			20 Nov 2017 19:50	1
HS17110944-16	17WW14-111517	15 Nov 2017 14:25			20 Nov 2017 20:15	1
HS17110944-17	17WW15-111517	15 Nov 2017 15:55			20 Nov 2017 20:40	1
Batch ID R305807	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water		
HS17110944-01	17TB02-111517	15 Nov 2017 10:00			20 Nov 2017 11:58	1
HS17110944-14	17TB03-111517	15 Nov 2017 10:05			20 Nov 2017 17:20	1
Batch ID R305927	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Groundwater		
HS17110944-18	17WW16-111517	15 Nov 2017 17:30			21 Nov 2017 11:41	1
HS17110944-19	17WW04-111617	16 Nov 2017 10:35			21 Nov 2017 12:05	1
HS17110944-20	17WW05-111617	16 Nov 2017 11:55			21 Nov 2017 12:30	1

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID	R306732	Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) Matrix: Groundwater				
HS17110944-02	17WW18-111517	15 Nov 2017 11:45			07 Dec 2017 14:28	1
HS17110944-03	17WW01-111517	15 Nov 2017 13:35			07 Dec 2017 14:28	1
HS17110944-04	17WW17-111517	15 Nov 2017 14:20			07 Dec 2017 14:28	1
HS17110944-05	17WW17-111517-FD	15 Nov 2017 14:20			07 Dec 2017 14:28	1
HS17110944-06	17WW02-111517	15 Nov 2017 15:15			07 Dec 2017 14:28	1
HS17110944-07	17WW02-111517-FD	15 Nov 2017 15:15			07 Dec 2017 14:28	1
HS17110944-08	17WW10-111517	15 Nov 2017 16:20			07 Dec 2017 14:28	1
HS17110944-09	17WW09-111517	15 Nov 2017 17:05			07 Dec 2017 14:28	1
HS17110944-10	18WW14-111617	16 Nov 2017 09:55			07 Dec 2017 14:28	1
HS17110944-11	18WW15-111617	16 Nov 2017 10:45			07 Dec 2017 14:28	1
HS17110944-12	17WW11-111617	16 Nov 2017 11:35			07 Dec 2017 14:28	1
HS17110944-13	17WW06-111617	16 Nov 2017 12:35			07 Dec 2017 14:28	1
HS17110944-15	18WW10-111517	15 Nov 2017 12:05			07 Dec 2017 14:28	1
HS17110944-16	17WW14-111517	15 Nov 2017 14:25			07 Dec 2017 14:28	1
HS17110944-17	17WW15-111517	15 Nov 2017 15:55			07 Dec 2017 14:28	1
HS17110944-18	17WW16-111517	15 Nov 2017 17:30			07 Dec 2017 14:28	1
HS17110944-19	17WW04-111617	16 Nov 2017 10:35			07 Dec 2017 14:28	1
HS17110944-20	17WW05-111617	16 Nov 2017 11:55			07 Dec 2017 14:28	1

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260						
MBLK	Sample ID: VBLKW-171120	Units: ug/L			Analysis Date: 20-Nov-2017 11:33					
Client ID:	Run ID: VOA6_305807	SeqNo: 4318308		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	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	10	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260					
MBLK	Sample ID: VBLKW-171120	Units: ug/L		Analysis Date: 20-Nov-2017 11:33					
Client ID:	Run ID: VOA6_305807	SeqNo: 4318308		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	1.0	2.0							U
Naphthalene	0.50	1.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	46.07	1.0	50	0	92.1	70 - 123			
Surr: 4-Bromofluorobenzene	50.01	1.0	50	0	100	82 - 115			
Surr: Dibromofluoromethane	46.56	1.0	50	0	93.1	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807											Instrument: VOA6			Method: SW8260		
MBLK		Sample ID: VBLKW-171120			Units: ug/L			Analysis Date: 20-Nov-2017 11:33								
Client ID:		Run ID: VOA6_305807			SeqNo: 4318308		PrepDate:		DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8		49.93	1.0	50	0	99.9	81 - 120									

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260						
LCS		Sample ID: VLCSW-171120		Units: ug/L		Analysis Date: 20-Nov-2017 10:18				
Client ID:		Run ID: VOA6_305807		SeqNo: 4318307		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	44.69	1.0	50	0	89.4	77 - 118				
1,1,1-Trichloroethane	42.71	1.0	50	0	85.4	70 - 130				
1,1,2,2-Tetrachloroethane	56.99	1.0	50	0	114	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	44.39	1.0	50	0	88.8	70 - 130				
1,1,2-Trichloroethane	47.39	1.0	50	0	94.8	77 - 113				
1,1-Dichloroethane	44.61	1.0	50	0	89.2	71 - 122				
1,1-Dichloroethene	43.29	1.0	50	0	86.6	70 - 130				
1,1-Dichloropropene	42	1.0	50	0	84.0	78 - 118				
1,2,3-Trichlorobenzene	59.05	1.0	50	0	118	70 - 130				
1,2,3-Trichloropropane	52.99	1.0	50	0	106	70 - 127				
1,2,4-Trichlorobenzene	52.85	1.0	50	0	106	77 - 126				
1,2,4-Trimethylbenzene	48.28	1.0	50	0	96.6	73 - 121				
1,2-Dibromo-3-chloropropane	54.18	1.0	50	0	108	70 - 130				
1,2-Dibromoethane	48.11	1.0	50	0	96.2	76 - 123				
1,2-Dichlorobenzene	48.26	1.0	50	0	96.5	77 - 113				
1,2-Dichloroethane	44.99	1.0	50	0	90.0	70 - 124				
1,2-Dichloropropane	43.4	1.0	50	0	86.8	72 - 119				
1,3,5-Trimethylbenzene	47.72	1.0	50	0	95.4	75 - 118				
1,3-Dichlorobenzene	47.2	1.0	50	0	94.4	78 - 118				
1,3-Dichloropropane	47.05	1.0	50	0	94.1	75 - 116				
1,4-Dichlorobenzene	46.9	1.0	50	0	93.8	79 - 113				
2,2-Dichloropropane	43.55	1.0	50	0	87.1	70 - 130				
2-Butanone	94.92	2.0	100	0	94.9	70 - 130				
2-Chlorotoluene	50.43	1.0	50	0	101	70 - 128				
2-Hexanone	91.06	2.0	100	0	91.1	70 - 130				
4-Chlorotoluene	50.69	1.0	50	0	101	74 - 126				
4-Isopropyltoluene	46.11	1.0	50	0	92.2	74 - 126				
4-Methyl-2-pentanone	92.03	2.0	100	0	92.0	70 - 130				
Acetone	103.2	2.0	100	0	103	70 - 130				
Benzene	43.15	1.0	50	0	86.3	74 - 120				
Bromobenzene	47.92	1.0	50	0	95.8	78 - 113				
Bromochloromethane	42.5	1.0	50	0	85.0	76 - 124				
Bromodichloromethane	43.46	1.0	50	0	86.9	74 - 122				
Bromoform	44.9	1.0	50	0	89.8	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260						
LCS		Sample ID: VLCSW-171120		Units: ug/L		Analysis Date: 20-Nov-2017 10:18				
Client ID:		Run ID: VOA6_305807		SeqNo: 4318307		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	45.61	1.0	50	0	91.2	70 - 130				
Carbon disulfide	90.89	2.0	100	0	90.9	70 - 130				
Carbon tetrachloride	41.75	1.0	50	0	83.5	71 - 125				
Chlorobenzene	46.07	1.0	50	0	92.1	76 - 113				
Chloroethane	43.03	1.0	50	0	86.1	70 - 130				
Chloroform	45.42	1.0	50	0	90.8	71 - 121				
Chloromethane	42.89	1.0	50	0	85.8	70 - 129				
cis-1,2-Dichloroethene	44.79	1.0	50	0	89.6	75 - 122				
cis-1,3-Dichloropropene	42.64	1.0	50	0	85.3	73 - 127				
Dibromochloromethane	47.1	1.0	50	0	94.2	77 - 122				
Dibromomethane	45.03	1.0	50	0	90.1	78 - 121				
Dichlorodifluoromethane	43	1.0	50	0	86.0	70 - 130				
Ethylbenzene	45.33	1.0	50	0	90.7	77 - 117				
Hexachlorobutadiene	45.15	1.0	50	0	90.3	70 - 130				
Isopropylbenzene	44.62	1.0	50	0	89.2	73 - 127				
m,p-Xylene	90.09	2.0	100	0	90.1	77 - 122				
Methylene chloride	43.77	2.0	50	0	87.5	70 - 127				
Naphthalene	56.29	1.0	50	0	113	70 - 130				
n-Butylbenzene	49.84	1.0	50	0	99.7	72 - 130				
n-Propylbenzene	48.34	1.0	50	0	96.7	73 - 124				
o-Xylene	45.13	1.0	50	0	90.3	75 - 119				
sec-Butylbenzene	45.55	1.0	50	0	91.1	73 - 128				
Styrene	46.49	1.0	50	0	93.0	72 - 126				
tert-Butylbenzene	45.29	1.0	50	0	90.6	73 - 124				
Tetrachloroethene	42.37	1.0	50	0	84.7	76 - 119				
Toluene	47.01	1.0	50	0	94.0	77 - 118				
trans-1,2-Dichloroethene	44.48	1.0	50	0	89.0	72 - 127				
trans-1,3-Dichloropropene	42.35	1.0	50	0	84.7	77 - 119				
Trichloroethene	41.05	1.0	50	0	82.1	77 - 121				
Trichlorofluoromethane	43.35	1.0	50	0	86.7	70 - 130				
Vinyl chloride	43.37	1.0	50	0	86.7	70 - 130				
Surr: 1,2-Dichloroethane-d4	46.79	1.0	50	0	93.6	70 - 130				
Surr: 4-Bromofluorobenzene	51.48	1.0	50	0	103	82 - 115				
Surr: Dibromofluoromethane	46.7	1.0	50	0	93.4	73 - 126				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807											Instrument: VOA6			Method: SW8260		
LCS		Sample ID: VLCSW-171120			Units: ug/L			Analysis Date: 20-Nov-2017 10:18								
Client ID:		Run ID: VOA6_305807			SeqNo: 4318307		PrepDate:		DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8		51.05	1.0	50	0	102	81 - 120									

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260						
MS		Sample ID: HS17110944-03MS		Units: ug/L		Analysis Date: 20-Nov-2017 15:41				
Client ID: 17WW01-111517		Run ID: VOA6_305807		SeqNo: 4318318		PrepDate:		DF: 100		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4429	100	5000	0	88.6	70 - 120				
1,1,1-Trichloroethane	4125	100	5000	0	82.5	70 - 130				
1,1,2,2-Tetrachloroethane	5249	100	5000	0	105	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	3992	100	5000	0	79.8	70 - 130				
1,1,2-Trichloroethane	4594	100	5000	0	91.9	70 - 117				
1,1-Dichloroethane	4366	100	5000	107.8	85.2	70 - 127				
1,1-Dichloroethene	4389	100	5000	285.9	82.1	70 - 130				
1,1-Dichloropropene	4024	100	5000	0	80.5	70 - 129				
1,2,3-Trichlorobenzene	3679	100	5000	0	73.6	70 - 130				
1,2,3-Trichloropropane	4917	100	5000	0	98.3	70 - 130				
1,2,4-Trichlorobenzene	3881	100	5000	0	77.6	70 - 125				
1,2,4-Trimethylbenzene	4556	100	5000	0	91.1	70 - 125				
1,2-Dibromo-3-chloropropane	4253	100	5000	0	85.1	70 - 130				
1,2-Dibromoethane	4622	100	5000	0	92.4	70 - 124				
1,2-Dichlorobenzene	4544	100	5000	0	90.9	70 - 115				
1,2-Dichloroethane	4561	100	5000	105.3	89.1	70 - 127				
1,2-Dichloropropane	4216	100	5000	0	84.3	70 - 122				
1,3,5-Trimethylbenzene	4536	100	5000	0	90.7	70 - 126				
1,3-Dichlorobenzene	4463	100	5000	0	89.3	70 - 119				
1,3-Dichloropropane	4560	100	5000	0	91.2	70 - 121				
1,4-Dichlorobenzene	4500	100	5000	0	90.0	70 - 114				
2,2-Dichloropropane	4069	100	5000	0	81.4	70 - 130				
2-Butanone	7936	200	10000	0	79.4	70 - 130				
2-Chlorotoluene	4750	100	5000	0	95.0	70 - 130				
2-Hexanone	8175	200	10000	0	81.7	70 - 130				
4-Chlorotoluene	4859	100	5000	0	97.2	70 - 130				
4-Isopropyltoluene	4228	100	5000	0	84.6	70 - 130				
4-Methyl-2-pentanone	8043	200	10000	0	80.4	70 - 130				
Acetone	8337	200	10000	0	83.4	70 - 130				
Benzene	4222	100	5000	0	84.4	70 - 127				
Bromobenzene	4760	100	5000	0	95.2	70 - 115				
Bromochloromethane	4570	100	5000	0	91.4	70 - 127				
Bromodichloromethane	4423	100	5000	0	88.5	70 - 124				
Bromoform	4238	100	5000	0	84.8	70 - 129				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260					
MS		Sample ID: HS17110944-03MS		Units: ug/L		Analysis Date: 20-Nov-2017 15:41			
Client ID: 17WW01-111517		Run ID: VOA6_305807		SeqNo: 4318318		PrepDate:		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	4562	100	5000	0	91.2	70 - 130			
Carbon disulfide	8503	200	10000	0	85.0	70 - 130			
Carbon tetrachloride	4072	100	5000	0	81.4	70 - 130			
Chlorobenzene	4483	100	5000	0	89.7	70 - 114			
Chloroethane	3914	100	5000	0	78.3	70 - 130			
Chloroform	4450	100	5000	0	89.0	70 - 125			
Chloromethane	4096	100	5000	0	81.9	70 - 130			
cis-1,2-Dichloroethene	7743	100	5000	3743	80.0	70 - 128			
cis-1,3-Dichloropropene	4253	100	5000	0	85.1	70 - 125			
Dibromochloromethane	4700	100	5000	0	94.0	70 - 124			
Dibromomethane	4448	100	5000	0	89.0	70 - 124			
Dichlorodifluoromethane	4363	100	5000	0	87.3	70 - 130			
Ethylbenzene	4325	100	5000	0	86.5	70 - 124			
Hexachlorobutadiene	3101	100	5000	0	62.0	70 - 130			S
Isopropylbenzene	4202	100	5000	0	84.0	70 - 130			
m,p-Xylene	8658	200	10000	0	86.6	70 - 130			
Methylene chloride	4343	200	5000	0	86.9	70 - 128			
Naphthalene	3447	100	5000	0	68.9	70 - 130			S
n-Butylbenzene	4336	100	5000	0	86.7	70 - 130			
n-Propylbenzene	4530	100	5000	0	90.6	70 - 130			
o-Xylene	4344	100	5000	0	86.9	70 - 124			
sec-Butylbenzene	4201	100	5000	0	84.0	70 - 130			
Styrene	4417	100	5000	0	88.3	70 - 130			
tert-Butylbenzene	4238	100	5000	0	84.8	70 - 130			
Tetrachloroethene	3958	100	5000	0	79.2	70 - 130			
Toluene	4569	100	5000	0	91.4	70 - 123			
trans-1,2-Dichloroethene	4307	100	5000	87.97	84.4	70 - 130			
trans-1,3-Dichloropropene	4207	100	5000	0	84.1	70 - 121			
Trichloroethene	9005	100	5000	6065	58.8	70 - 129			S
Trichlorofluoromethane	4149	100	5000	0	83.0	70 - 130			
Vinyl chloride	4120	100	5000	0	82.4	70 - 130			
Surr: 1,2-Dichloroethane-d4	4573	100	5000	0	91.5	70 - 126			
Surr: 4-Bromofluorobenzene	5092	100	5000	0	102	81 - 113			
Surr: Dibromofluoromethane	4693	100	5000	0	93.9	77 - 123			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260						
MS	Sample ID: HS17110944-03MS		Units: ug/L		Analysis Date: 20-Nov-2017 15:41					
	Client ID: 17WW01-111517		Run ID: VOA6_305807		SeqNo: 4318318		PrepDate:		DF: 100	
	Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: Toluene-d8		5081	100	5000	0	102	82 - 127			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260					
MSD		Sample ID: HS17110944-03MSD		Units: ug/L		Analysis Date: 20-Nov-2017 16:06			
Client ID: 17WW01-111517		Run ID: VOA6_305807		SeqNo: 4318319		PrepDate:		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
1,1,1,2-Tetrachloroethane	4565	100	5000	0	91.3	70 - 120	4429	3.02	20
1,1,1-Trichloroethane	4034	100	5000	0	80.7	70 - 130	4125	2.24	20
1,1,2,2-Tetrachloroethane	5586	100	5000	0	112	70 - 123	5249	6.23	20
1,1,2-Trichlor-1,2,2-trifluoroethane	3586	100	5000	0	71.7	70 - 130	3992	10.7	20
1,1,2-Trichloroethane	4860	100	5000	0	97.2	70 - 117	4594	5.63	20
1,1-Dichloroethane	4420	100	5000	107.8	86.2	70 - 127	4366	1.22	20
1,1-Dichloroethene	4300	100	5000	285.9	80.3	70 - 130	4389	2.07	20
1,1-Dichloropropene	3878	100	5000	0	77.6	70 - 129	4024	3.71	20
1,2,3-Trichlorobenzene	5405	100	5000	0	108	70 - 130	3679	38	20 R
1,2,3-Trichloropropane	5204	100	5000	0	104	70 - 130	4917	5.67	20
1,2,4-Trichlorobenzene	4933	100	5000	0	98.7	70 - 125	3881	23.9	20 R
1,2,4-Trimethylbenzene	4700	100	5000	0	94.0	70 - 125	4556	3.11	20
1,2-Dibromo-3-chloropropane	5091	100	5000	0	102	70 - 130	4253	18	20
1,2-Dibromoethane	4866	100	5000	0	97.3	70 - 124	4622	5.14	20
1,2-Dichlorobenzene	4748	100	5000	0	95.0	70 - 115	4544	4.38	20
1,2-Dichloroethane	4721	100	5000	105.3	92.3	70 - 127	4561	3.46	20
1,2-Dichloropropane	4285	100	5000	0	85.7	70 - 122	4216	1.62	20
1,3,5-Trimethylbenzene	4590	100	5000	0	91.8	70 - 126	4536	1.18	20
1,3-Dichlorobenzene	4588	100	5000	0	91.8	70 - 119	4463	2.77	20
1,3-Dichloropropane	4802	100	5000	0	96.0	70 - 121	4560	5.17	20
1,4-Dichlorobenzene	4670	100	5000	0	93.4	70 - 114	4500	3.69	20
2,2-Dichloropropane	4035	100	5000	0	80.7	70 - 130	4069	0.847	20
2-Butanone	8436	200	10000	0	84.4	70 - 130	7936	6.11	20
2-Chlorotoluene	4864	100	5000	0	97.3	70 - 130	4750	2.37	20
2-Hexanone	8831	200	10000	0	88.3	70 - 130	8175	7.72	20
4-Chlorotoluene	4905	100	5000	0	98.1	70 - 130	4859	0.942	20
4-Isopropyltoluene	4363	100	5000	0	87.3	70 - 130	4228	3.14	20
4-Methyl-2-pentanone	8635	200	10000	0	86.4	70 - 130	8043	7.1	20
Acetone	9056	200	10000	0	90.6	70 - 130	8337	8.28	20
Benzene	4218	100	5000	0	84.4	70 - 127	4222	0.0925	20
Bromobenzene	4862	100	5000	0	97.2	70 - 115	4760	2.13	20
Bromochloromethane	4427	100	5000	0	88.5	70 - 127	4570	3.18	20
Bromodichloromethane	4468	100	5000	0	89.4	70 - 124	4423	1.01	20
Bromoform	4521	100	5000	0	90.4	70 - 129	4238	6.48	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807		Instrument: VOA6		Method: SW8260					
MSD		Sample ID: HS17110944-03MSD		Units: ug/L		Analysis Date: 20-Nov-2017 16:06			
Client ID: 17WW01-111517		Run ID: VOA6_305807		SeqNo: 4318319		PrepDate:		DF: 100	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	4784	100	5000	0	95.7	70 - 130	4562	4.75	20
Carbon disulfide	8402	200	10000	0	84.0	70 - 130	8503	1.19	20
Carbon tetrachloride	3812	100	5000	0	76.2	70 - 130	4072	6.59	20
Chlorobenzene	4607	100	5000	0	92.1	70 - 114	4483	2.73	20
Chloroethane	3893	100	5000	0	77.9	70 - 130	3914	0.546	20
Chloroform	4557	100	5000	0	91.1	70 - 125	4450	2.38	20
Chloromethane	4156	100	5000	0	83.1	70 - 130	4096	1.46	20
cis-1,2-Dichloroethene	7895	100	5000	3743	83.0	70 - 128	7743	1.94	20
cis-1,3-Dichloropropene	4276	100	5000	0	85.5	70 - 125	4253	0.529	20
Dibromochloromethane	4900	100	5000	0	98.0	70 - 124	4700	4.17	20
Dibromomethane	4590	100	5000	0	91.8	70 - 124	4448	3.15	20
Dichlorodifluoromethane	4008	100	5000	0	80.2	70 - 130	4363	8.49	20
Ethylbenzene	4382	100	5000	0	87.6	70 - 124	4325	1.32	20
Hexachlorobutadiene	3718	100	5000	0	74.4	70 - 130	3101	18.1	20
Isopropylbenzene	4270	100	5000	0	85.4	70 - 130	4202	1.62	20
m,p-Xylene	8781	200	10000	0	87.8	70 - 130	8658	1.41	20
Methylene chloride	4457	200	5000	0	89.1	70 - 128	4343	2.6	20
Naphthalene	5128	100	5000	0	103	70 - 130	3447	39.2	20 R
n-Butylbenzene	4588	100	5000	0	91.8	70 - 130	4336	5.65	20
n-Propylbenzene	4568	100	5000	0	91.4	70 - 130	4530	0.825	20
o-Xylene	4451	100	5000	0	89.0	70 - 124	4344	2.42	20
sec-Butylbenzene	4330	100	5000	0	86.6	70 - 130	4201	3.02	20
Styrene	4646	100	5000	0	92.9	70 - 130	4417	5.05	20
tert-Butylbenzene	4358	100	5000	0	87.2	70 - 130	4238	2.8	20
Tetrachloroethene	3912	100	5000	0	78.2	70 - 130	3958	1.17	20
Toluene	4610	100	5000	0	92.2	70 - 123	4569	0.891	20
trans-1,2-Dichloroethene	4334	100	5000	87.97	84.9	70 - 130	4307	0.625	20
trans-1,3-Dichloropropene	4315	100	5000	0	86.3	70 - 121	4207	2.54	20
Trichloroethene	9075	100	5000	6065	60.2	70 - 129	9005	0.777	20 S
Trichlorofluoromethane	3948	100	5000	0	79.0	70 - 130	4149	4.96	20
Vinyl chloride	4019	100	5000	0	80.4	70 - 130	4120	2.48	20
Surr: 1,2-Dichloroethane-d4	4509	100	5000	0	90.2	70 - 126	4573	1.4	20
Surr: 4-Bromofluorobenzene	5071	100	5000	0	101	81 - 113	5092	0.416	20
Surr: Dibromofluoromethane	4633	100	5000	0	92.7	77 - 123	4693	1.3	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305807											Instrument: VOA6			Method: SW8260		
MSD		Sample ID: HS17110944-03MSD			Units: ug/L			Analysis Date: 20-Nov-2017 16:06								
Client ID: 17WW01-111517		Run ID: VOA6_305807			SeqNo: 4318319		PrepDate:		DF: 100							
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual					
Surr: Toluene-d8		5053	100	5000	0	101	82 - 127	5081	0.564	20						

The following samples were analyzed in this batch:

HS17110944-01	HS17110944-02	HS17110944-03	HS17110944-04
HS17110944-05	HS17110944-06	HS17110944-07	HS17110944-08
HS17110944-09	HS17110944-10	HS17110944-11	HS17110944-12
HS17110944-13	HS17110944-14	HS17110944-15	HS17110944-16
HS17110944-17			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260						
MBLK	Sample ID: VBLKW-171121	Units: ug/L			Analysis Date: 21-Nov-2017 10:51					
Client ID:	Run ID: VOA6_305927	SeqNo: 4321210		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	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	10	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260					
MBLK	Sample ID: VBLKW-171121	Units: ug/L		Analysis Date: 21-Nov-2017 10:51					
Client ID:	Run ID: VOA6_305927	SeqNo: 4321210		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	1.0	2.0							U
Naphthalene	0.50	1.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	45.94	1.0	50	0	91.9	70 - 123			
Surr: 4-Bromofluorobenzene	50.24	1.0	50	0	100	82 - 115			
Surr: Dibromofluoromethane	46.27	1.0	50	0	92.5	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260	
MBLK	Sample ID: VBLKW-171121	Units: ug/L		Analysis Date: 21-Nov-2017 10:51	
Client ID:	Run ID: VOA6_305927	SeqNo: 4321210		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>49.73</i>	<i>1.0</i>	<i>50</i>	<i>0 99.5</i>	<i>81 - 120</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260						
LCS		Sample ID: VLCSW-171121		Units: ug/L		Analysis Date: 21-Nov-2017 09:36				
Client ID:		Run ID: VOA6_305927		SeqNo: 4321209		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	44.07	1.0	50	0	88.1	77 - 118				
1,1,1-Trichloroethane	41.4	1.0	50	0	82.8	70 - 130				
1,1,2,2-Tetrachloroethane	54.9	1.0	50	0	110	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	39.53	1.0	50	0	79.1	70 - 130				
1,1,2-Trichloroethane	45.96	1.0	50	0	91.9	77 - 113				
1,1-Dichloroethane	42.99	1.0	50	0	86.0	71 - 122				
1,1-Dichloroethene	42.53	1.0	50	0	85.1	70 - 130				
1,1-Dichloropropene	40.56	1.0	50	0	81.1	78 - 118				
1,2,3-Trichlorobenzene	54.61	1.0	50	0	109	70 - 130				
1,2,3-Trichloropropane	51.32	1.0	50	0	103	70 - 127				
1,2,4-Trichlorobenzene	50.14	1.0	50	0	100	77 - 126				
1,2,4-Trimethylbenzene	47.41	1.0	50	0	94.8	73 - 121				
1,2-Dibromo-3-chloropropane	50.79	1.0	50	0	102	70 - 130				
1,2-Dibromoethane	46.21	1.0	50	0	92.4	76 - 123				
1,2-Dichlorobenzene	46.39	1.0	50	0	92.8	77 - 113				
1,2-Dichloroethane	44.98	1.0	50	0	90.0	70 - 124				
1,2-Dichloropropane	42.42	1.0	50	0	84.8	72 - 119				
1,3,5-Trimethylbenzene	46.44	1.0	50	0	92.9	75 - 118				
1,3-Dichlorobenzene	45.68	1.0	50	0	91.4	78 - 118				
1,3-Dichloropropane	45.97	1.0	50	0	91.9	75 - 116				
1,4-Dichlorobenzene	45.68	1.0	50	0	91.4	79 - 113				
2,2-Dichloropropane	41.85	1.0	50	0	83.7	70 - 130				
2-Butanone	85.7	2.0	100	0	85.7	70 - 130				
2-Chlorotoluene	48.6	1.0	50	0	97.2	70 - 128				
2-Hexanone	84.22	2.0	100	0	84.2	70 - 130				
4-Chlorotoluene	48.79	1.0	50	0	97.6	74 - 126				
4-Isopropyltoluene	44.94	1.0	50	0	89.9	74 - 126				
4-Methyl-2-pentanone	83.95	2.0	100	0	83.9	70 - 130				
Acetone	91.14	2.0	100	0	91.1	70 - 130				
Benzene	42.56	1.0	50	0	85.1	74 - 120				
Bromobenzene	47.84	1.0	50	0	95.7	78 - 113				
Bromochloromethane	41.78	1.0	50	0	83.6	76 - 124				
Bromodichloromethane	44.01	1.0	50	0	88.0	74 - 122				
Bromoform	42.08	1.0	50	0	84.2	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260					
LCS	Sample ID: VLCSW-171121	Units: ug/L			Analysis Date: 21-Nov-2017 09:36				
Client ID:	Run ID: VOA6_305927	SeqNo: 4321209		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	46.9	1.0	50	0	93.8	70 - 130			
Carbon disulfide	88.09	2.0	100	0	88.1	70 - 130			
Carbon tetrachloride	39.64	1.0	50	0	79.3	71 - 125			
Chlorobenzene	45.14	1.0	50	0	90.3	76 - 113			
Chloroethane	43.02	1.0	50	0	86.0	70 - 130			
Chloroform	44.37	1.0	50	0	88.7	71 - 121			
Chloromethane	42.53	1.0	50	0	85.1	70 - 129			
cis-1,2-Dichloroethene	43.78	1.0	50	0	87.6	75 - 122			
cis-1,3-Dichloropropene	41.81	1.0	50	0	83.6	73 - 127			
Dibromochloromethane	46.29	1.0	50	0	92.6	77 - 122			
Dibromomethane	44.39	1.0	50	0	88.8	78 - 121			
Dichlorodifluoromethane	38.93	1.0	50	0	77.9	70 - 130			
Ethylbenzene	43.7	1.0	50	0	87.4	77 - 117			
Hexachlorobutadiene	45.76	1.0	50	0	91.5	70 - 130			
Isopropylbenzene	42.33	1.0	50	0	84.7	73 - 127			
m,p-Xylene	87.65	2.0	100	0	87.6	77 - 122			
Methylene chloride	42.76	2.0	50	0	85.5	70 - 127			
Naphthalene	49.98	1.0	50	0	100.0	70 - 130			
n-Butylbenzene	48.37	1.0	50	0	96.7	72 - 130			
n-Propylbenzene	46.78	1.0	50	0	93.6	73 - 124			
o-Xylene	43.86	1.0	50	0	87.7	75 - 119			
sec-Butylbenzene	44.73	1.0	50	0	89.5	73 - 128			
Styrene	44.98	1.0	50	0	90.0	72 - 126			
tert-Butylbenzene	43.93	1.0	50	0	87.9	73 - 124			
Tetrachloroethene	39.41	1.0	50	0	78.8	76 - 119			
Toluene	46.02	1.0	50	0	92.0	77 - 118			
trans-1,2-Dichloroethene	43.5	1.0	50	0	87.0	72 - 127			
trans-1,3-Dichloropropene	42.79	1.0	50	0	85.6	77 - 119			
Trichloroethene	40.26	1.0	50	0	80.5	77 - 121			
Trichlorofluoromethane	39.34	1.0	50	0	78.7	70 - 130			
Vinyl chloride	41.22	1.0	50	0	82.4	70 - 130			
Surr: 1,2-Dichloroethane-d4	46.63	1.0	50	0	93.3	70 - 130			
Surr: 4-Bromofluorobenzene	52.24	1.0	50	0	104	82 - 115			
Surr: Dibromofluoromethane	46.4	1.0	50	0	92.8	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260	
LCS	Sample ID: VLCSW-171121	Units: ug/L		Analysis Date: 21-Nov-2017 09:36	
Client ID:	Run ID: VOA6_305927	SeqNo: 4321209		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>51.43</i>	<i>1.0</i>	<i>50</i>	<i>0 103</i>	<i>81 - 120</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260						
MS		Sample ID: HS17111049-04MS		Units: ug/L		Analysis Date: 21-Nov-2017 17:04				
Client ID:		Run ID: VOA6_305927		SeqNo: 4321212		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	32.52	1.0	50	0	65.0	70 - 120				S
1,1,1-Trichloroethane	31.4	1.0	50	0	62.8	70 - 130				S
1,1,2,2-Tetrachloroethane	49.67	1.0	50	0	99.3	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	34.07	1.0	50	0	68.1	70 - 130				S
1,1,2-Trichloroethane	36.19	1.0	50	0	72.4	70 - 117				
1,1-Dichloroethane	32.08	1.0	50	0	64.2	70 - 127				S
1,1-Dichloroethene	34.79	1.0	50	0	69.6	70 - 130				S
1,1-Dichloropropene	31.05	1.0	50	0	62.1	70 - 129				S
1,2,3-Trichlorobenzene	31.18	1.0	50	0	62.4	70 - 130				S
1,2,3-Trichloropropane	47.58	1.0	50	0	95.2	70 - 130				
1,2,4-Trichlorobenzene	29.07	1.0	50	0	58.1	70 - 125				S
1,2,4-Trimethylbenzene	32.21	1.0	50	0	64.4	70 - 125				S
1,2-Dibromo-3-chloropropane	44.87	1.0	50	0	89.7	70 - 130				
1,2-Dibromoethane	37.25	1.0	50	0	74.5	70 - 124				
1,2-Dichlorobenzene	33.29	1.0	50	0	66.6	70 - 115				S
1,2-Dichloroethane	34.73	1.0	50	0	69.5	70 - 127				S
1,2-Dichloropropane	31.16	1.0	50	0	62.3	70 - 122				S
1,3,5-Trimethylbenzene	33.91	1.0	50	0	67.8	70 - 126				S
1,3-Dichlorobenzene	32.53	1.0	50	0	65.1	70 - 119				S
1,3-Dichloropropane	35.72	1.0	50	0	71.4	70 - 121				
1,4-Dichlorobenzene	32.15	1.0	50	0	64.3	70 - 114				S
2,2-Dichloropropane	31.12	1.0	50	0	62.2	70 - 130				S
2-Butanone	80.08	2.0	100	0	80.1	70 - 130				
2-Chlorotoluene	36.17	1.0	50	0	72.3	70 - 130				
2-Hexanone	73.19	2.0	100	0	73.2	70 - 130				
4-Chlorotoluene	36.97	1.0	50	0	73.9	70 - 130				
4-Isopropyltoluene	29.2	1.0	50	0	58.4	70 - 130				S
4-Methyl-2-pentanone	77.07	2.0	100	0	77.1	70 - 130				
Acetone	80.72	2.0	100	0	80.7	70 - 130				
Benzene	31.04	1.0	50	0	62.1	70 - 127				S
Bromobenzene	37.42	1.0	50	0	74.8	70 - 115				
Bromochloromethane	32.39	1.0	50	0	64.8	70 - 127				S
Bromodichloromethane	33.31	1.0	50	0	66.6	70 - 124				S
Bromoform	36.63	1.0	50	0	73.3	70 - 129				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260					
MS		Sample ID: HS17111049-04MS		Units: ug/L		Analysis Date: 21-Nov-2017 17:04			
Client ID:		Run ID: VOA6_305927		SeqNo: 4321212		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	34.21	1.0	50	0	68.4	70 - 130			S
Carbon disulfide	65.89	2.0	100	0	65.9	70 - 130			S
Carbon tetrachloride	31.74	1.0	50	0	63.5	70 - 130			S
Chlorobenzene	33.13	1.0	50	0	66.3	70 - 114			S
Chloroethane	32.11	1.0	50	0	64.2	70 - 130			S
Chloroform	33.4	1.0	50	0	66.8	70 - 125			S
Chloromethane	30.58	1.0	50	0	61.2	70 - 130			S
cis-1,2-Dichloroethene	32.76	1.0	50	0	65.5	70 - 128			S
cis-1,3-Dichloropropene	31.14	1.0	50	0	62.3	70 - 125			S
Dibromochloromethane	36.84	1.0	50	0	73.7	70 - 124			
Dibromomethane	35.61	1.0	50	0	71.2	70 - 124			
Dichlorodifluoromethane	35.63	1.0	50	0	71.3	70 - 130			
Ethylbenzene	32.46	1.0	50	0	64.9	70 - 124			S
Hexachlorobutadiene	23.25	1.0	50	0	46.5	70 - 130			S
Isopropylbenzene	31.3	1.0	50	0	62.6	70 - 130			S
m,p-Xylene	63.55	2.0	100	0	63.5	70 - 130			S
Methylene chloride	32.56	2.0	50	0	65.1	70 - 128			S
Naphthalene	32.9	1.0	50	0	65.8	70 - 130			S
n-Butylbenzene	29.73	1.0	50	0	59.5	70 - 130			S
n-Propylbenzene	34.78	1.0	50	0	69.6	70 - 130			S
o-Xylene	31.93	1.0	50	0	63.9	70 - 124			S
sec-Butylbenzene	29.6	1.0	50	0	59.2	70 - 130			S
Styrene	32.93	1.0	50	0	65.9	70 - 130			S
tert-Butylbenzene	29.95	1.0	50	0	59.9	70 - 130			S
Tetrachloroethene	29.49	1.0	50	0	59.0	70 - 130			S
Toluene	33.27	1.0	50	0	66.5	70 - 123			S
trans-1,2-Dichloroethene	32.79	1.0	50	0	65.6	70 - 130			S
trans-1,3-Dichloropropene	31.86	1.0	50	0	63.7	70 - 121			S
Trichloroethene	29.39	1.0	50	0	58.8	70 - 129			S
Trichlorofluoromethane	35.91	1.0	50	0	71.8	70 - 130			
Vinyl chloride	32.02	1.0	50	0	64.0	70 - 130			S
Surr: 1,2-Dichloroethane-d4	47.88	1.0	50	0	95.8	70 - 126			
Surr: 4-Bromofluorobenzene	53.08	1.0	50	0	106	81 - 113			
Surr: Dibromofluoromethane	47.21	1.0	50	0	94.4	77 - 123			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260						
MS	Sample ID:	HS17111049-04MS			Units: ug/L		Analysis Date: 21-Nov-2017 17:04			
	Client ID:	Run ID: VOA6_305927		SeqNo: 4321212		PrepDate:		DF: 1		
	Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Surr: Toluene-d8		49.78	1.0	50	0	99.6	82 - 127			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260						
MSD		Sample ID: HS17111049-04MSD		Units: ug/L		Analysis Date: 21-Nov-2017 17:28				
Client ID:		Run ID: VOA6_305927		SeqNo: 4321213		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	34.81	1.0	50	0	69.6	70 - 120	32.52	6.81	20	S
1,1,1-Trichloroethane	31.47	1.0	50	0	62.9	70 - 130	31.4	0.212	20	S
1,1,2,2-Tetrachloroethane	52.94	1.0	50	0	106	70 - 123	49.67	6.38	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	32.83	1.0	50	0	65.7	70 - 130	34.07	3.72	20	S
1,1,2-Trichloroethane	37.73	1.0	50	0	75.5	70 - 117	36.19	4.15	20	
1,1-Dichloroethane	32.37	1.0	50	0	64.7	70 - 127	32.08	0.913	20	S
1,1-Dichloroethene	33.88	1.0	50	0	67.8	70 - 130	34.79	2.63	20	S
1,1-Dichloropropene	31.2	1.0	50	0	62.4	70 - 129	31.05	0.478	20	S
1,2,3-Trichlorobenzene	41.01	1.0	50	0	82.0	70 - 130	31.18	27.2	20	R
1,2,3-Trichloropropane	51.08	1.0	50	0	102	70 - 130	47.58	7.09	20	
1,2,4-Trichlorobenzene	37.1	1.0	50	0	74.2	70 - 125	29.07	24.3	20	R
1,2,4-Trimethylbenzene	34.43	1.0	50	0	68.9	70 - 125	32.21	6.64	20	S
1,2-Dibromo-3-chloropropane	49.25	1.0	50	0	98.5	70 - 130	44.87	9.3	20	
1,2-Dibromoethane	39.12	1.0	50	0	78.2	70 - 124	37.25	4.9	20	
1,2-Dichlorobenzene	36.48	1.0	50	0	73.0	70 - 115	33.29	9.13	20	
1,2-Dichloroethane	35.56	1.0	50	0	71.1	70 - 127	34.73	2.38	20	
1,2-Dichloropropane	32.18	1.0	50	0	64.4	70 - 122	31.16	3.2	20	S
1,3,5-Trimethylbenzene	35.46	1.0	50	0	70.9	70 - 126	33.91	4.48	20	
1,3-Dichlorobenzene	34.76	1.0	50	0	69.5	70 - 119	32.53	6.63	20	S
1,3-Dichloropropane	37.15	1.0	50	0	74.3	70 - 121	35.72	3.94	20	
1,4-Dichlorobenzene	34.96	1.0	50	0	69.9	70 - 114	32.15	8.39	20	S
2,2-Dichloropropane	31.2	1.0	50	0	62.4	70 - 130	31.12	0.256	20	S
2-Butanone	82.39	2.0	100	0	82.4	70 - 130	80.08	2.85	20	
2-Chlorotoluene	37.57	1.0	50	0	75.1	70 - 130	36.17	3.79	20	
2-Hexanone	75.74	2.0	100	0	75.7	70 - 130	73.19	3.42	20	
4-Chlorotoluene	37.94	1.0	50	0	75.9	70 - 130	36.97	2.61	20	
4-Isopropyltoluene	31.75	1.0	50	0	63.5	70 - 130	29.2	8.36	20	S
4-Methyl-2-pentanone	79.94	2.0	100	0	79.9	70 - 130	77.07	3.66	20	
Acetone	84	2.0	100	0	84.0	70 - 130	80.72	3.97	20	
Benzene	31.92	1.0	50	0	63.8	70 - 127	31.04	2.79	20	S
Bromobenzene	38.79	1.0	50	0	77.6	70 - 115	37.42	3.6	20	
Bromochloromethane	33.57	1.0	50	0	67.1	70 - 127	32.39	3.58	20	S
Bromodichloromethane	34.17	1.0	50	0	68.3	70 - 124	33.31	2.55	20	S
Bromoform	38.79	1.0	50	0	77.6	70 - 129	36.63	5.71	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260						
MSD		Sample ID: HS17111049-04MSD		Units: ug/L		Analysis Date: 21-Nov-2017 17:28				
Client ID:		Run ID: VOA6_305927		SeqNo: 4321213		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	34.61	1.0	50	0	69.2	70 - 130	34.21	1.18	20	S
Carbon disulfide	65.51	2.0	100	0	65.5	70 - 130	65.89	0.586	20	S
Carbon tetrachloride	31.17	1.0	50	0	62.3	70 - 130	31.74	1.83	20	S
Chlorobenzene	34.14	1.0	50	0	68.3	70 - 114	33.13	2.98	20	S
Chloroethane	31.79	1.0	50	0	63.6	70 - 130	32.11	0.986	20	S
Chloroform	33.8	1.0	50	0	67.6	70 - 125	33.4	1.21	20	S
Chloromethane	30.55	1.0	50	0	61.1	70 - 130	30.58	0.105	20	S
cis-1,2-Dichloroethene	33.48	1.0	50	0	67.0	70 - 128	32.76	2.18	20	S
cis-1,3-Dichloropropene	32.57	1.0	50	0	65.1	70 - 125	31.14	4.51	20	S
Dibromochloromethane	37.95	1.0	50	0	75.9	70 - 124	36.84	2.98	20	
Dibromomethane	36.96	1.0	50	0	73.9	70 - 124	35.61	3.74	20	
Dichlorodifluoromethane	34.51	1.0	50	0	69.0	70 - 130	35.63	3.22	20	S
Ethylbenzene	33.69	1.0	50	0	67.4	70 - 124	32.46	3.72	20	S
Hexachlorobutadiene	28.88	1.0	50	0	57.8	70 - 130	23.25	21.6	20	SR
Isopropylbenzene	32.63	1.0	50	0	65.3	70 - 130	31.3	4.15	20	S
m,p-Xylene	66.54	2.0	100	0	66.5	70 - 130	63.55	4.59	20	S
Methylene chloride	32.63	2.0	50	0	65.3	70 - 128	32.56	0.212	20	S
Naphthalene	43.82	1.0	50	0	87.6	70 - 130	32.9	28.5	20	R
n-Butylbenzene	33.55	1.0	50	0	67.1	70 - 130	29.73	12	20	S
n-Propylbenzene	35.83	1.0	50	0	71.7	70 - 130	34.78	2.97	20	
o-Xylene	33.04	1.0	50	0	66.1	70 - 124	31.93	3.41	20	S
sec-Butylbenzene	31.96	1.0	50	0	63.9	70 - 130	29.6	7.66	20	S
Styrene	34.55	1.0	50	0	69.1	70 - 130	32.93	4.79	20	S
tert-Butylbenzene	32.33	1.0	50	0	64.7	70 - 130	29.95	7.63	20	S
Tetrachloroethene	29.89	1.0	50	0	59.8	70 - 130	29.49	1.32	20	S
Toluene	33.89	1.0	50	0	67.8	70 - 123	33.27	1.84	20	S
trans-1,2-Dichloroethene	32.75	1.0	50	0	65.5	70 - 130	32.79	0.123	20	S
trans-1,3-Dichloropropene	33.98	1.0	50	0	68.0	70 - 121	31.86	6.44	20	S
Trichloroethene	30.78	1.0	50	0	61.6	70 - 129	29.39	4.62	20	S
Trichlorofluoromethane	33.14	1.0	50	0	66.3	70 - 130	35.91	8.02	20	S
Vinyl chloride	32.27	1.0	50	0	64.5	70 - 130	32.02	0.775	20	S
Surr: 1,2-Dichloroethane-d4	47.29	1.0	50	0	94.6	70 - 126	47.88	1.24	20	
Surr: 4-Bromofluorobenzene	52.8	1.0	50	0	106	81 - 113	53.08	0.542	20	
Surr: Dibromofluoromethane	46.65	1.0	50	0	93.3	77 - 123	47.21	1.19	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

QC BATCH REPORT

Batch ID: R305927		Instrument: VOA6		Method: SW8260	
MSD	Sample ID: HS17111049-04MSD	Units: ug/L		Analysis Date: 21-Nov-2017 17:28	
Client ID:	Run ID: VOA6_305927	SeqNo: 4321213		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>49.87</i>	<i>1.0</i>	<i>50</i>	<i>0 99.7</i>	<i>82 - 127 49.78 0.191 20</i>

The following samples were analyzed in this batch: HS17110944-18 HS17110944-19 HS17110944-20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 1

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS17110944

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Carolina	624-2017	31-Dec-2017
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018

ALS Group USA, Corp

Date: 20-Dec-17

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS17110944

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS17110944-01	17TB02-111517	Login	11/18/2017 11:19:12 AM	SDW	VOA019
HS17110944-02	17WW18-111517	Login	11/18/2017 11:19:12 AM	SDW	Sub
HS17110944-02	17WW18-111517	Login	11/18/2017 11:19:12 AM	SDW	VOA019
HS17110944-03	17WW01-111517	Login	11/18/2017 11:19:13 AM	SDW	Sub
HS17110944-03	17WW01-111517	Login	11/18/2017 11:19:13 AM	SDW	VOA019
HS17110944-04	17WW17-111517	Login	11/18/2017 11:19:13 AM	SDW	Sub
HS17110944-04	17WW17-111517	Login	11/18/2017 11:19:13 AM	SDW	VOA019
HS17110944-05	17WW17-111517-FD	Login	11/18/2017 11:19:13 AM	SDW	Sub
HS17110944-05	17WW17-111517-FD	Login	11/18/2017 11:19:13 AM	SDW	VOA019
HS17110944-06	17WW02-111517	Login	11/18/2017 11:19:13 AM	SDW	Sub
HS17110944-06	17WW02-111517	Login	11/18/2017 11:19:13 AM	SDW	VOA019
HS17110944-07	17WW02-111517-FD	Login	11/18/2017 11:19:14 AM	SDW	Sub
HS17110944-07	17WW02-111517-FD	Login	11/18/2017 11:19:14 AM	SDW	VOA019
HS17110944-08	17WW10-111517	Login	11/18/2017 11:19:14 AM	SDW	Sub
HS17110944-08	17WW10-111517	Login	11/18/2017 11:19:14 AM	SDW	VOA019
HS17110944-09	17WW09-111517	Login	11/18/2017 11:19:14 AM	SDW	Sub
HS17110944-09	17WW09-111517	Login	11/18/2017 11:19:14 AM	SDW	VOA019
HS17110944-10	18WW14-111617	Login	11/18/2017 11:19:14 AM	SDW	Sub
HS17110944-10	18WW14-111617	Login	11/18/2017 11:19:14 AM	SDW	VOA019
HS17110944-11	18WW15-111617	Login	11/18/2017 11:19:15 AM	SDW	Sub
HS17110944-11	18WW15-111617	Login	11/18/2017 11:19:15 AM	SDW	VOA019
HS17110944-12	17WW11-111617	Login	11/18/2017 11:19:15 AM	SDW	Sub
HS17110944-12	17WW11-111617	Login	11/18/2017 11:19:15 AM	SDW	VOA019
HS17110944-13	17WW06-111617	Login	11/18/2017 11:19:15 AM	SDW	Sub
HS17110944-13	17WW06-111617	Login	11/18/2017 11:19:15 AM	SDW	VOA019
HS17110944-14	17TB03-111517	Login	11/18/2017 11:19:15 AM	SDW	VOA019
HS17110944-15	18WW10-111517	Login	11/18/2017 11:19:16 AM	SDW	Sub
HS17110944-15	18WW10-111517	Login	11/18/2017 11:19:16 AM	SDW	VOA019
HS17110944-16	17WW14-111517	Login	11/18/2017 11:19:16 AM	SDW	Sub
HS17110944-16	17WW14-111517	Login	11/18/2017 11:19:16 AM	SDW	VOA019
HS17110944-17	17WW15-111517	Login	11/18/2017 11:19:16 AM	SDW	Sub
HS17110944-17	17WW15-111517	Login	11/18/2017 11:19:16 AM	SDW	VOA019
HS17110944-18	17WW16-111517	Login	11/18/2017 11:19:16 AM	SDW	Sub
HS17110944-18	17WW16-111517	Login	11/18/2017 11:19:16 AM	SDW	VOA019
HS17110944-19	17WW04-111617	Login	11/18/2017 11:21:18 AM	SDW	Sub
HS17110944-19	17WW04-111617	Login	11/18/2017 11:21:18 AM	SDW	VOA019
HS17110944-20	17WW05-111617	Login	11/18/2017 11:21:18 AM	SDW	Sub
HS17110944-20	17WW05-111617	Login	11/18/2017 11:21:18 AM	SDW	VOA019

Revision:1

ALS Group USA, Corp

Date: 20-Dec-17

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS17110944

Date/Time Received: **17-Nov-2017 08:30**
 Received by: **RPG**

Checklist completed by: Nelson D. Dusara 18-Nov-2017
 eSignature Date

Reviewed by: Corey Grandits 20-Nov-2017
 eSignature Date

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 ☐
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.3 C/0.6 C UC/C IR 11

Cooler(s)/Kit(s): 43278

Date/Time sample(s) sent to storage: 1117/2017 18:00

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:

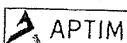
Login Notes: Sample 17WW10-111617 container time 17:05 / COC time is 16:20. Sample 17WW09-111517 container time 16:20 / COC time is 17:05.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

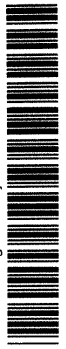


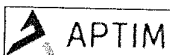
Page 1 of 2

COC ID: 17-NOV2017-GW-ALSHT-111617		TURNAROUND TIME: normal		RUSH:							
PROJECT/CLIENT INFO				LABORATORY							
Facility Name: Longhorn AAP		Lab Name: ALS Laboratories		Email Invoice To: FedInvoices@CBIFederalServices.com							
Project Number: 501032		Lab Contact: Sonia West		Email Report To: Sharon.Pennington@CBIFederalServices.com							
Address: LHAAP-17		Email: Sonia.West@alsglobal.com		Mail Reports To: Sharon Pennington							
Address: 1203-B East Grand Avenue		Address: 10450 Stancil Rd., Suite 210		Address: 2410 Cherahala Blvd.							
City: Marshall		City: Houston		City: Knoxville							
State: TX		State: TX		State: TN							
Postal Code: 75670		Postal Code: 77099		Postal Code: 37932							
Country: USA		Country: USA		Country: USA							
Phone Number: 713.243.7264		Phone Number: 281.575.2132 or 281.530.5656		Shipping Company: FEDEX							
Project Manager: Praveen Srivastav											
SAMPLE DETAILS				ANALYSIS REQUESTED							
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	VOCs in Water by 8260B	Pesticides in Water by 6850	
17TB02-111517	FIELDQC	n/a	n/a	n/a	LIQ	11/15/2017	1000	2	2		
17WW18-111517	17WW18	11.15	12.18	ft	GW	11/15/2017	1145	4	3	1	
17WW01-111517	17WW01	11.05	11.65	ft	GW	11/15/2017	1335	4	3	1	
17WW01-111517-MS	17WW01	11.05	11.65	ft	GW	11/15/2017	1335	4	3	1	
17WW01-111517-MSD	17WW01	11.05	11.65	ft	GW	11/15/2017	1335	4	3	1	
17WW17-111517	17WW17	11.25	12.8	ft	GW	11/15/2017	1420	4	3	1	
17WW17-111517-FD	17WW17	11.25	12.8	ft	GW	11/15/2017	1420	4	3	1	
17WW02-111517	17WW02	9	10.4	ft	GW	11/15/2017	1515	4	3	1	
17WW02-111517-FD	17WW02	9	10.4	ft	GW	11/15/2017	1515	4	3	1	
17WW10-111517	17WW10	13.65	14.1	ft	GW	11/15/2017	1620	4	3	1	
17WW09-111517	17WW09	13.65	14.58	ft	GW	11/15/2017	1705	4	3	1	
18WW14-111617	18WW14	18.7	18.9	ft	GW	11/16/2017	955	4	3	1	
18WW15-111617	18WW15	18.45	18.9	ft	GW	11/16/2017	1045	4	3	1	
17WW12-111617	17WW12	12.3	13.2	ft	GW	11/16/2017	1135	4	3	1	
17WW06-111617	17WW06	11.7	11.95	ft	GW	11/16/2017	1235	4	3	1	
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS				RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION		DATE/TIME	
				DAVID R. RYAN / APTIM		11/16/17 1500		R. C. GIBBS		11/17/17 08:30.	
										COPIES # 43278	
										IR # 11	
										CF + 0.3.	

HS17110944

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant
REVISED
 12-14-17

APTIM		COC ID: 17-NOV2017-GW-ALSHT-111617		TURNAROUND TIME: normal		Page 2 of 2		
PROJECT/CLIENT INFO				LABORATORY		OTHER INFO		
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			
Project Number	301032			Lab Contact	Sonia West			
Address	LHAAP-17 1203-B East Grand Avenue PMB 202			Email	Sonia.West@alsglobal.com			
City	Marshall	State	TX	Address	10450 Stanchiff Rd., Suite 210			
Postal Code	75670	Country	USA	City	Houston	State	TX	
Phone Number	713.243.7264			Postal Code	77099	Country	USA	
Project Manager	Praveen Srivastav			Phone Number	281.575.2132 or 281.530.5656			
				Email Invoice To		FedInvoices@CBIFederalServices.com		
				Email Report To		Sharon.Pennington@CBIFederalServices.com		
				Mail Reports To		Sharon Pennington		
				Address		2410 Cherahala Blvd.		
				City		Knoxville	State	
				Postal Code		37932	TN	
				Country		USA		
				Shipping Company		FEDEX		
SAMPLE DETAILS								
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.
17TB03-111517	FIELDQC	n/a	n/a	n/a	LIQ	11/15/2017	1005	2
18WW10-111517	18WW10	15.1	15.98	ft	GW	11/15/2017	1205	4
17WW14-111517	17WW14	13.95	14.32	ft	GW	11/15/2017	1425	4
17WW15-111517	17WW15	15.15	17.26	ft	GW	11/15/2017	1555	4
17WW16-111517	17WW16	13.15	15.58	ft	GW	11/15/2017	1730	4
17WW04-111617	17WW04	12.35	12.7	ft	GW	11/16/2017	1035	4
17WW05-111617	17WW05	14.15	16.5	ft	GW	11/16/2017	1155	4
REVISED 11-14-17								
ANALYSIS REQUESTED								
VOCs in Water by 8260B Perchlorate in Water by 6850								
HS17110944 Aptim Environmental & Infrastructure, Inc. Longhorn Army Ammunition Plant								
								
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS			RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION	
			D. J. / Aptim		11/16/17 1500		R. C. / Aptim	
			DAVIDSON				11/17/17 08:30	
							order # 43278	
							CF +0.3	



COC ID: 17-NOV2017-GW-ALSHT-111617

TURNAROUND TIME: normal

RUSH:

PROJECT/CLIENT INFO				LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP			Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com		
Project Number	501032			Lab Contact	Sonia West						
	LHAAP-17			Email	Sonia.West@alsglobal.com			Email Report To	Sharon.Pennington@CBIFederalServices.com		
Address	1203-B East Grand Avenue			Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Sharon Pennington		
	PMB 202							Address	2410 Cherahala Blvd.		
City	Marshall	State	TX	City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA	Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264			Phone Number	281.575.2132 or 281.530.5656						
Project Manager	Praveen Srivastav							Shipping Company	FEDEX		

SAMPLE DETAILS									ANALYSIS REQUESTED																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	VOCs in Water by 8260B	Perchlorate in Water by 6850																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

HS17110944

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant



ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	David R. / APTIM DAVID ROWAN	11/16/17 1500	R. C. / APTIM	11/17/17 08:30. Cooler # 43278 IR # 11 CF +0.3.

COC ID: 17-NOV2017-GW-ALSHT-111617

TURNAROUND TIME: normal

RUSH;

PROJECT/CLIENT INFO					LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP				Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com		
Project Number	501032				Lab Contact	Sonia West						
	LHAAP-17				Email	Sonia.West@alsglobal.com			Email Report To	Sharon.Pennington@CBIFederalServices.com		
Address	1203-B East Grand Avenue				Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Sharon Pennington		
	PMB 202								Address	2410 Cherahala Blvd.		
City	Marshall	State	TX		City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA		Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264				Phone Number	281.575.2132 or 281.530.5656						
Project Manager	Praveen Srivastav								Shipping Company	FEDEX		

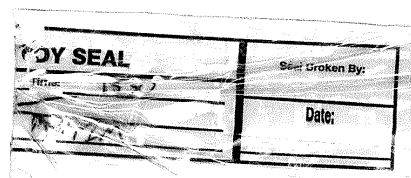
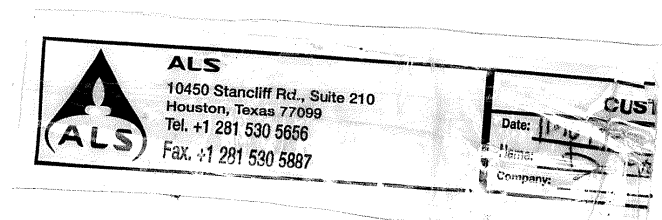
[illegible]

HS17110944

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant



ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	<i>D. Roman</i> / ACTEM	11/16/17	<i>R. C. G.</i>	11/17/17 08:30
	DAVID ROMAN	1500		Order # 43278
				CF +0.3





Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1732567

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2003 (203932)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Samples 1732567007/08 were re-analyzed and reported at a 1:100 dilutions. Sample 1732567014 was re-analyzed and reported at a 1:10,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 576521) was less than 1/2 the CRDL. The recovery for the LCS (576522) was within acceptable parameters.

MS/MSD Analysis: The matrix spike and matrix spike duplicate (MS/MSD) was performed on samples 1732567003/04 (Client ID: 17WW01-111517). The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.



Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): None were required for this set.

Sample Calculation: Samples were reported in $\mu\text{g/L}$. Results were calculated in $\mu\text{g/L}$ by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve ($\mu\text{g/L}$)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1. Manual Integrations were performed for some of the Initial Calibration analyses (datafiles: 28NOVP01/02) along with datafiles 30NOVP15/22/37.

Thomas Bosch December 06, 2017
Date



ANALYTICAL REPORT

Amended-20171215

Report Date: December 15, 2017

Sonia West
ALS Environmental
10450 Stancliff Rd.
Suite 210
Houston, TX 77099

Phone: (281) 530-5656

E-mail: Sonia.West@alsglobal.com

Workorder: **34-1732567**

Project ID: HS17110944 111517

Purchase Order: HS17110944

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
17WW18-111517	1732567001	11/15/17	11/21/17	
17WW01-111517	1732567002	11/15/17	11/21/17	
17WW17-111517	1732567005	11/15/17	11/21/17	
17WW01-111517-FD	1732567006	11/15/17	11/21/17	
17WW02-111517	1732567007	11/15/17	11/21/17	
17WW02-111517-FD	1732567008	11/15/17	11/21/17	
17WW10-111517	1732567009	11/15/17	11/21/17	
17WW09-111517	1732567010	11/15/17	11/21/17	
18WW14-111617	1732567011	11/16/17	11/21/17	
18WW15-111617	1732567012	11/16/17	11/21/17	
17WW11-111617	1732567013	11/16/17	11/21/17	
17WW06-111617	1732567014	11/16/17	11/21/17	
18WW10-111517	1732567015	11/15/17	11/21/17	
17WW14-111517	1732567016	11/15/17	11/21/17	
17WW15-111517	1732567017	11/15/17	11/21/17	
17WW16-111517	1732567018	11/15/17	11/21/17	
17WW04-111617	1732567019	11/16/17	11/21/17	
17WW05-111617	1732567020	11/16/17	11/21/17	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
17WW01-111517MS	1732567003	11/15/17	11/21/17	
17WW01-111517MSD	1732567004	11/15/17	11/21/17	

*Client QC is reported as part of the Quality Control results report, if requested.



ANALYTICAL REPORT

Amended-20171215

Workorder: 34-1732567

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 17WW18-111517		Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567001		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 10:42		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	ND	1.0	2.0	4.0	1 U

Sample ID: 17WW01-111517			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567002			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 11:01		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW17-111517			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567005			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 11:58		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW01-111517-FD			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567006			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 12:18		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Amended-20171215

Workorder: 34-1732567

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 17WW02-111517		Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567007		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 18:27		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	2500	100	200	400	100

Sample ID: 17WW02-111517-FD			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567008			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 18:46		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	3400	100	200	400	100	

Sample ID: 17WW10-111517		Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567009		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 13:15		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	1.6	1.0	2.0	4.0	1 J

Sample ID: 17WW09-111517		Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567010		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable		Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 13:34		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	ND	1.0	2.0	4.0	1 U



ANALYTICAL REPORT

Amended-20171215

Workorder: 34-1732567

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18WW14-111617		Sampling Site: NA		Collected: 11/16/2017	
Lab ID: 1732567011		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 13:53		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	ND	1.0	2.0	4.0	1 U

Sample ID: 18WW15-111617			Sampling Site: NA		Collected: 11/16/2017	
Lab ID: 1732567012			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 14:12		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW11-111617			Sampling Site: NA		Collected: 11/16/2017	
Lab ID: 1732567013			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 15:54		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW06-111617		Sampling Site: NA		Collected: 11/16/2017	
Lab ID: 1732567014		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 12/01/2017 09:34		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	110000	10000	20000	40000	10000



ANALYTICAL REPORT

Amended-20171215

Workorder: 34-1732567

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 18WW10-111517		Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567015		Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water		Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM					
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 16:32		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution Qual
Perchlorate	52	1.0	2.0	4.0	1

Sample ID: 17WW14-111517			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567016			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 16:51		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	2.5	1.0	2.0	4.0	1	J

Sample ID: 17WW15-111517			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567017			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 17:10		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW16-111517			Sampling Site: NA		Collected: 11/15/2017	
Lab ID: 1732567018			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2003 (HBN: 203932) Analyzed: 11/30/2017 17:30		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U



ANALYTICAL REPORT

Amended-20171215

Workorder: 34-1732567

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 17WW04-111617		Sampling Site: NA		Collected: 11/16/2017		
Lab ID: 1732567019		Media: 250 mL Nalgene		Received: 11/21/2017		
Matrix: Water		Sampling Parameter: NA				
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water		Instrument ID: LCMS04	
			Batch: ELMS/2003 (HBN: 203932)		Percent Solid: NA	
			Analyzed: 11/30/2017 17:49		Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW05-111617			Sampling Site: NA		Collected: 11/16/2017	
Lab ID: 1732567020			Media: 250 mL Nalgene		Received: 11/21/2017	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water		Instrument ID: LCMS04	
			Batch: ELMS/2003 (HBN: 203932)		Percent Solid: NA	
			Analyzed: 11/30/2017 18:08		Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Workorder: 1732567

Sample 013 changed from 17WW12-111617 to 17WW11-111617

Quality Control: EPA 6850, DoD QSM - (HBN: 203932)

Samples 1732567007/08 were re-analyzed and reported at a 1:100 dilutions. Sample 1732567014 was re-analyzed and reported at a 1:10,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/05/2017 15:01	/S/ Stephen Brose 12/07/2017 11:18

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: als@ALSglobal.com
Web: www.alslc.com

**ANALYTICAL REPORT****Amended-20171215****Workorder:** 34-1732567**Client:** ALS Environmental
(Houston)**Project Manager:** Kevin W. Griffiths**General Lab Comments**

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint ,Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

**ANALYTICAL REPORT****Amended-20171215****Workorder:** 34-1732567**Client:** ALS Environmental
(Houston)**Project Manager:** Kevin W. Griffiths**Result Symbol Definitions**

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< This testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00898709

Analysis Information

Workorder: 1732567**Limits:** Client SOW/Contract Specified**Preparation:** NA**Analysis:** EPA 6850**Basis:** DoD QSM**Batch:** NA**Batch:** ELMS/2003 (HBN: 203932)**Prepared By:** NA**Analyzed By:** Thomas Bosch

Blank

LMB: 576521**Analyzed:** 11/30/2017 09:42**Units:** ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 576522**Analyzed:** 11/30/2017 10:02**Dilution:** 1**Units:** ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	5.11	5.00	102	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1732567002**Analyzed:** 11/30/2017 11:01**Dilution:** 1**Units:** ug/L**MS:** 1732567003**Analyzed:** 11/30/2017 11:20**Dilution:** 1**Units:** ug/L**MSD:** 1732567004**Analyzed:** 11/30/2017 11:39**Dilution:** 1**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.69	5	93.7	78.8	123.8	4.9	97.9	4.39	0.0	20.0

Continuing Calibration Verification

CCV: 576518**Analyzed:** 11/30/2017 08:45**Units:** ug/L**Criteria:** $\pm 15\%$ **CCV:** 576523**Analyzed:** 11/30/2017 14:32**Units:** ug/L**Criteria:** $\pm 15\%$ **CCV:** 576525**Analyzed:** 11/30/2017 19:05**Units:** ug/L**Criteria:** $\pm 15\%$

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	26.5	25.0	106	26.5	25.0	106	26.1	25.0	104

CCV: 576773**Analyzed:** 12/01/2017 10:31**Units:** ug/L**Criteria:** $\pm 15\%$

Analyte	Result	Target	% Rec.
Perchlorate	27.0	25.0	108

Interference Check Sample

ICSA: 576520**Analyzed:** 11/30/2017 10:21**Units:** ug/L**Criteria:** $\pm 30\%$

Analyte	Result	Target	% Rec.
Perchlorate	1.10	1.00	110



Quality Control Sample Batch Report

00898710

Analysis Information

Workorder: 1732567**Limits:** Client SOW/Contract Specified**Preparation:** NA**Analysis:** EPA 6850**Basis:** DoD QSM**Batch:** NA**Batch:** ELMS/2003 (HBN: 203932)**Prepared By:** NA**Analyzed By:** Thomas Bosch

Limit of Detection Verification

LODV: 576519 Analyzed: 11/30/2017 09:04 Units: ug/L Criteria: $\pm 50\%$				LODV: 576524 Analyzed: 11/30/2017 15:35 Units: ug/L Criteria: $\pm 50\%$			LODV: 576526 Analyzed: 12/01/2017 09:15 Units: ug/L Criteria: $\pm 50\%$		
Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	1.11	1.00	111	1.04	1.00	104	1.34	1.00	134

LODV: 576774 Analyzed: 12/01/2017 10:51 Units: ug/L Criteria: $\pm 50\%$			
Analyte	Result	Target	% Rec.
Perchlorate	1.16	1.00	116

Comments

Samples 1732567007/08 were re-analyzed and reported at a 1:100 dilutions. Sample 1732567014 was re-analyzed and reported at a 1:10,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 12/05/2017 15:02	/S/ Stephen Brose 12/07/2017 11:18

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable



18698 #2

1732567

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

COC ID: 8078

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Sonia West
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Sonia.West@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: HS17110944
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS17110944-02	17WW18-111517	Groundwater	15 Nov 2017 11:45
	SUB_Perch-6850			29 Nov 2017
2.	HS17110944-03	17WW01-111517	Groundwater	15 Nov 2017 13:35 MS/MSD
	SUB_Perch-6850			29 Nov 2017
3.	HS17110944-04	17WW17-111517	Groundwater	15 Nov 2017 14:20
	SUB_Perch-6850			29 Nov 2017
4.	HS17110944-05	17WW01-111517-FD	Water	15 Nov 2017 14:20
	SUB_Perch-6850			29 Nov 2017
5.	HS17110944-06	17WW02-111517	Groundwater	15 Nov 2017 15:15
	SUB_Perch-6850			29 Nov 2017
6.	HS17110944-07	17WW02-111517-FD	Water	15 Nov 2017 15:15
	SUB_Perch-6850			29 Nov 2017
7.	HS17110944-08	17WW10-111517	Groundwater	15 Nov 2017 16:20
	SUB_Perch-6850			29 Nov 2017
8.	HS17110944-09	17WW09-111517	Groundwater	15 Nov 2017 17:05
	SUB_Perch-6850			29 Nov 2017
9.	HS17110944-10	18WW14-111617	Groundwater	16 Nov 2017 09:55

RIGHT SCOUTING, RIGHT PARTNER



Subcontract Chain of Custody

COC ID: 8078

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			29 Nov 2017
10. HS17110944-11	18WW15-111617	Groundwater	16 Nov 2017 10:45
SUB_Perch-6850			29 Nov 2017
11. HS17110944-12	17WW12-111617	Groundwater	16 Nov 2017 11:35
SUB_Perch-6850			29 Nov 2017
12. HS17110944-13	17WW06-111617	Groundwater	16 Nov 2017 12:35
SUB_Perch-6850			29 Nov 2017
13. HS17110944-15	18WW10-111517	Groundwater	15 Nov 2017 12:05
SUB_Perch-6850			29 Nov 2017
14. HS17110944-16	17WW14-111517	Groundwater	15 Nov 2017 14:25
SUB_Perch-6850			29 Nov 2017
15. HS17110944-17	17WW15-111517	Groundwater	15 Nov 2017 15:55
SUB_Perch-6850			29 Nov 2017
16. HS17110944-18	17WW16-111517	Groundwater	15 Nov 2017 17:30
SUB_Perch-6850			29 Nov 2017
17. HS17110944-19	17WW04-111617	Groundwater	16 Nov 2017 10:35
SUB_Perch-6850			29 Nov 2017
18. HS17110944-20	17WW05-111617	Groundwater	16 Nov 2017 11:55
SUB_Perch-6850			29 Nov 2017

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

Please run MS/MSD on sample HS17110944-03/17WW01-111517

QC Level: DOD IV (DoD Data Package)

Relinquished By:

R. Giga

Date/Time:

11/20/17 18:00

Received By:

Desert

Date/Time:

11/21/17 9:18

Cooler ID(s):

Temperature(s):



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www.alsglobal.com

Subcontract Chain of Custody

COC ID: 8078

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

REVISED

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Sonia West
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Sonia.West@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: HS17110944
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS17110944-02	17WW18-111517	Groundwater	15 Nov 2017 11:45
	SUB_Perch-6850			29 Nov 2017
2.	HS17110944-03	17WW01-111517	Groundwater	15 Nov 2017 13:35
	SUB_Perch-6850			29 Nov 2017
3.	HS17110944-04	17WW17-111517	Groundwater	15 Nov 2017 14:20
	SUB_Perch-6850			29 Nov 2017
4.	HS17110944-05	17WW01-111517-FD	Water	15 Nov 2017 14:20
	SUB_Perch-6850			29 Nov 2017
5.	HS17110944-06	17WW02-111517	Groundwater	15 Nov 2017 15:15
	SUB_Perch-6850			29 Nov 2017
6.	HS17110944-07	17WW02-111517-FD	Water	15 Nov 2017 15:15
	SUB_Perch-6850			29 Nov 2017
7.	HS17110944-08	17WW10-111517	Groundwater	15 Nov 2017 16:20
	SUB_Perch-6850			29 Nov 2017
8.	HS17110944-09	17WW09-111517	Groundwater	15 Nov 2017 17:05
	SUB_Perch-6850			29 Nov 2017
9.	HS17110944-10	18WW14-111617	Groundwater	16 Nov 2017 09:55

RIGHT SOLUTIONS | RIGHT PARTNER



Subcontract Chain of Custody

COC ID: 8078

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			29 Nov 2017
10. HS17110944-11	18WW15-111617	Groundwater	16 Nov 2017 10:45
SUB_Perch-6850			29 Nov 2017
11. HS17110944-12	17WW11-111617 12-15-17	Groundwater	16 Nov 2017 11:35
SUB_Perch-6850			29 Nov 2017
12. HS17110944-13	17WW06-111617	Groundwater	16 Nov 2017 12:35
SUB_Perch-6850			29 Nov 2017
13. HS17110944-15	18WW10-111517	Groundwater	15 Nov 2017 12:05
SUB_Perch-6850			29 Nov 2017
14. HS17110944-16	17WW14-111517	Groundwater	15 Nov 2017 14:25
SUB_Perch-6850			29 Nov 2017
15. HS17110944-17	17WW15-111517	Groundwater	15 Nov 2017 15:55
SUB_Perch-6850			29 Nov 2017
16. HS17110944-18	17WW16-111517	Groundwater	15 Nov 2017 17:30
SUB_Perch-6850			29 Nov 2017
17. HS17110944-19	17WW04-111617	Groundwater	16 Nov 2017 10:35
SUB_Perch-6850			29 Nov 2017
18. HS17110944-20	17WW05-111617	Groundwater	16 Nov 2017 11:55
SUB_Perch-6850			29 Nov 2017

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

Please run MS/MSD on sample HS17110944-03/17WW01-111517

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____

Date/Time: _____

Received By: _____

Date/Time: _____

Cooler ID(s): _____

Temperature(s): _____

ALS - SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS HOUSTON</u>		Project/Task/Site: <u>8078</u>						
Date/Time of Receipt: <u>11/21/2017 9:18</u>		Number of Coolers Received: <u>1</u>						
Condition of Coolers: <u>Acceptable</u> Unacceptable		Temperature Control: <u>Present</u> Not Included						
Cooler Custody Seals: <u>Present</u> Absent NA		Location Temp Taken: <u>Control</u> Between Samples						
Container Custody Seals: <u>Present</u> Absent NA		Are all temperatures within project specific guidelines? Yes/No/NA						
Ice Present: <u>Yes</u> No/NA		VOA Headspace Present? Yes/No/NA						
Intact/Broken NA		Frozen/Melted/NA						
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA		
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA		
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA		
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	TOC Preserved	Yes/No/NA		
Cooler Received	ALS Cooler No.	Temp.	Cooler Received	ALS Cooler No.	Temp.	Cooler Received	ALS Cooler No.	Temp.
1	C17- 8030	2 °C	4	C17-	°C	7	C17-	°C
2	C17-	°C	5	C17-	°C	8	C17-	°C
3	C17-	°C	6	C17-	°C	9	C17-	°C
Taken By: <u>Donna Heer</u> <u>Desiree Hill</u> <u>11/21/2017</u>								
Signature Printed Name Date								

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Sample HS17110944-03 has 3 bottles.

E-mailed to Client? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager:

Printed Name

Returned to Sample Receipt by:

Signature

Date:



Part # 159469-434 RIT2 KP 07/18

ORIGIN ID:SGRA (281) 530-5656
 SHIPPING DEPT
 ALS LABORATORY GROUP
 10450 STANCLIFF RD
 SUITE 210
 HOUSTON, TX 77099
 UNITED STATES US.

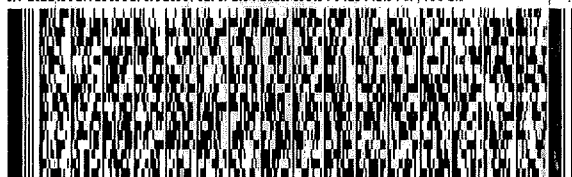
SHIP DATE: 20NOV17
 ACTWGT: 26.55 LB
 CAD: 300130/CAFE3108
 DIMS: 19x16x13 IN
 BILL SENDER

TO **KEVIN GRIFFITHS**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS17110944 SW



FedEx
Express



TRK# 7376 9750 3259
 0201

TUE - 21 NOV 3:00P
 STANDARD OVERNIGHT

AX BTFA

84123
 UT-US SLC





Batch Worklist

Batch: ELMS/ 2003

Created: 11/30/2017 08:32

Instrument: LCMS04

HBN: 203932

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: RE



Workorder: 1732567 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	576518	CCV for HBN 203932 [ELMS/2003]				CCV	3		E685041C3Q	5311		12/7/2017	11/30/2017
2	576519	LODV for HBN 203932 [ELMS/2003]				LODV	3		E6850.D3Q	5311		12/7/2017	11/30/2017
3	576520	ICS for HBN 203932 [ELMS/2003]				ICS	3		E6850.D3Q	5311		12/7/2017	11/30/2017
4	576521	LMB for HBN 203932 [ELMS/2003]				LMB	3		E6850Q413Q	5311		12/7/2017	11/30/2017
5	576522	LCS for HBN 203932 [ELMS/2003]				LCS	3		E6850Q413Q	5311		12/7/2017	11/30/2017
6	1732567001	17WW18-111517				SAMPLE	3	1732567001-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
7	1732567002	17WW01-111517				SAMPLE	3	1732567002-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
8	1732567003	17WW01-111517MS				MS	3	1732567003-A	E6850Q413Q	5480		12/7/2017	11/30/2017
9	1732567004	17WW01-111517MSD				MSD	3	1732567004-A	E6850Q413Q	5480		12/7/2017	11/30/2017
10	1732567005	17WW17-111517				SAMPLE	3	1732567005-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
11	1732567006	17WW01-111517-FD				FLDDUP	3	1732567006-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
12	1732567007	17WW02-111517				SAMPLE	3	1732567007-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
13	1732567008	17WW02-111517-FD				FLDDUP	3	1732567008-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
14	1732567009	17WW10-111517				SAMPLE	3	1732567009-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
15	1732567010	17WW09-111517				SAMPLE	3	1732567010-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
16	576523	CCV for HBN 203932 [ELMS/2003]				CCV	3		E685041C3Q	5311		12/7/2017	11/30/2017
17	576524	LODV for HBN 203932 [ELMS/2003]				LODV	3		E6850.D3Q	5311		12/7/2017	11/30/2017
18	1732567011	18WW14-111617				SAMPLE	3	1732567011-A	E6850Q41.3	5480	12/14/2017	12/7/2017	11/30/2017
19	1732567012	18WW15-111617				SAMPLE	3	1732567012-A	E6850Q41.3	5480	12/14/2017	12/7/2017	11/30/2017
20	1732567013	17WW12-111617				SAMPLE	3	1732567013-A	E6850Q41.3	5480	12/14/2017	12/7/2017	11/30/2017
21	1732567014	17WW06-111617				SAMPLE	3	1732567014-A	E6850Q41.3	5480	12/14/2017	12/7/2017	12/1/2017
22	1732567015	18WW10-111517				SAMPLE	3	1732567015-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
23	1732567016	17WW14-111517				SAMPLE	3	1732567016-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
24	1732567017	17WW15-111517				SAMPLE	3	1732567017-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
25	1732567018	17WW16-111517				SAMPLE	3	1732567018-A	E6850Q41.3	5480	12/13/2017	12/7/2017	11/30/2017
26	1732567019	17WW04-111617				SAMPLE	3	1732567019-A	E6850Q41.3	5480	12/14/2017	12/7/2017	11/30/2017
27	1732567020	17WW05-111617				SAMPLE	3	1732567020-A	E6850Q41.3	5480	12/14/2017	12/7/2017	11/30/2017
28	576525	CCV for HBN 203932 [ELMS/2003]				CCV	3		E685041C3Q	5311		12/7/2017	11/30/2017
29	576526	LODV for HBN 203932 [ELMS/2003]				LODV	3		E6850.D3Q	5311		12/7/2017	12/1/2017



Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
30	576773	CCV for HBN 203932 [ELMS/2003]				CCV	3		E685041C3Q	5311		12/7/2017	
31	576774	LODV for HBN 203932 [ELMS/2003]				LODV	3		E6850..D3Q	5311		12/7/2017	



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February 01, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010689**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 3 sample(s) on Jan 17, 2018 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: Jumokey.Lawal
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010689

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010689-01	17TB01-011518	Water	ALS- 121217-85	15-Jan-2018 08:00	17-Jan-2018 10:00	☐
HS18010689-02	17WW19-011518	Water		15-Jan-2018 11:05	17-Jan-2018 10:00	☐
HS18010689-03	17WW19-011518-FD	Water		15-Jan-2018 11:05	17-Jan-2018 10:00	☐

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010689

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City. Final report attached.

Work Order Comments

-

GCMS Volatiles by Method SW8260**Batch ID: R309787****Sample ID: CCV**

- Bromomethane exceeded %D limits on CCV. Samples ND.

Batch ID: R309702

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB01-011518
 Collection Date: 15-Jan-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18010689
 Lab ID:HS18010689-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	27-Jan-2018 14:14
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	27-Jan-2018 14:14
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	27-Jan-2018 14:14
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	27-Jan-2018 14:14
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	27-Jan-2018 14:14
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17TB01-011518
 Collection Date: 15-Jan-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18010689
 Lab ID:HS18010689-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	27-Jan-2018 14:14
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	27-Jan-2018 14:14
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:14
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	29-Jan-2018 12:34
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:14
Surr: 1,2-Dichloroethane-d4	93.1			0	70-126	%REC	1	27-Jan-2018 14:14
Surr: 1,2-Dichloroethane-d4	92.2			0	70-126	%REC	1	29-Jan-2018 12:34
Surr: 4-Bromofluorobenzene	98.3			0	81-113	%REC	1	27-Jan-2018 14:14
Surr: 4-Bromofluorobenzene	95.8			0	81-113	%REC	1	29-Jan-2018 12:34
Surr: Dibromofluoromethane	104			0	77-123	%REC	1	27-Jan-2018 14:14
Surr: Dibromofluoromethane	104			0	77-123	%REC	1	29-Jan-2018 12:34
Surr: Toluene-d8	93.3			0	82-127	%REC	1	27-Jan-2018 14:14
Surr: Toluene-d8	91.9			0	82-127	%REC	1	29-Jan-2018 12:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW19-011518
 Collection Date: 15-Jan-2018 11:05

ANALYTICAL REPORT

WorkOrder:HS18010689
 Lab ID:HS18010689-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	27-Jan-2018 14:39
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	27-Jan-2018 14:39
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	27-Jan-2018 14:39
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	27-Jan-2018 14:39
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	27-Jan-2018 14:39
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW19-011518
 Collection Date: 15-Jan-2018 11:05

ANALYTICAL REPORT

WorkOrder:HS18010689
 Lab ID:HS18010689-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	27-Jan-2018 14:39
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	27-Jan-2018 14:39
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 14:39
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	29-Jan-2018 12:59
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 14:39
Surr: 1,2-Dichloroethane-d4	93.8			0	70-126	%REC	1	27-Jan-2018 14:39
Surr: 1,2-Dichloroethane-d4	91.4			0	70-126	%REC	1	29-Jan-2018 12:59
Surr: 4-Bromofluorobenzene	98.3			0	81-113	%REC	1	27-Jan-2018 14:39
Surr: 4-Bromofluorobenzene	97.2			0	81-113	%REC	1	29-Jan-2018 12:59
Surr: Dibromofluoromethane	104			0	77-123	%REC	1	27-Jan-2018 14:39
Surr: Dibromofluoromethane	103			0	77-123	%REC	1	29-Jan-2018 12:59
Surr: Toluene-d8	91.7			0	82-127	%REC	1	27-Jan-2018 14:39
Surr: Toluene-d8	92.5			0	82-127	%REC	1	29-Jan-2018 12:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2018 16:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW19-011518-FD
 Collection Date: 15-Jan-2018 11:05

ANALYTICAL REPORT

WorkOrder:HS18010689
 Lab ID:HS18010689-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	27-Jan-2018 19:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	27-Jan-2018 19:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	27-Jan-2018 19:10
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	27-Jan-2018 19:10
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	27-Jan-2018 19:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW19-011518-FD
 Collection Date: 15-Jan-2018 11:05

ANALYTICAL REPORT

WorkOrder:HS18010689
 Lab ID:HS18010689-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	27-Jan-2018 19:10
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	27-Jan-2018 19:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	27-Jan-2018 19:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	29-Jan-2018 13:23
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	27-Jan-2018 19:10
Surr: 1,2-Dichloroethane-d4	93.1			0	70-126	%REC	1	27-Jan-2018 19:10
Surr: 1,2-Dichloroethane-d4	92.0			0	70-126	%REC	1	29-Jan-2018 13:23
Surr: 4-Bromofluorobenzene	98.0			0	81-113	%REC	1	27-Jan-2018 19:10
Surr: 4-Bromofluorobenzene	96.7			0	81-113	%REC	1	29-Jan-2018 13:23
Surr: Dibromofluoromethane	104			0	77-123	%REC	1	27-Jan-2018 19:10
Surr: Dibromofluoromethane	104			0	77-123	%REC	1	29-Jan-2018 13:23
Surr: Toluene-d8	92.6			0	82-127	%REC	1	27-Jan-2018 19:10
Surr: Toluene-d8	91.9			0	82-127	%REC	1	29-Jan-2018 13:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Feb-2018 16:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R309702	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water		
HS18010689-01	17TB01-011518	15 Jan 2018 08:00			27 Jan 2018 14:14	1
HS18010689-02	17WW19-011518	15 Jan 2018 11:05			27 Jan 2018 14:39	1
HS18010689-03	17WW19-011518-FD	15 Jan 2018 11:05			27 Jan 2018 19:10	1
Batch ID R309787	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water		
HS18010689-01	17TB01-011518	15 Jan 2018 08:00			29 Jan 2018 12:34	1
HS18010689-02	17WW19-011518	15 Jan 2018 11:05			29 Jan 2018 12:59	1
HS18010689-03	17WW19-011518-FD	15 Jan 2018 11:05			29 Jan 2018 13:23	1
Batch ID R310039	Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water		
HS18010689-02	17WW19-011518	15 Jan 2018 11:05			01 Feb 2018 16:08	1
HS18010689-03	17WW19-011518-FD	15 Jan 2018 11:05			01 Feb 2018 16:08	1

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260						
MBLK	Sample ID: VBLKW-180127	Units: ug/L			Analysis Date: 27-Jan-2018 10:57					
Client ID:	Run ID: VOA2_309702	SeqNo: 4408593		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	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW-180127	Units: ug/L		Analysis Date: 27-Jan-2018 10:57					
Client ID:	Run ID: VOA2_309702	SeqNo: 4408593		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	1.0	2.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	46.08	1.0	50	0	92.2	70 - 123			
Surr: 4-Bromofluorobenzene	49.15	1.0	50	0	98.3	82 - 115			
Surr: Dibromofluoromethane	51.08	1.0	50	0	102	73 - 126			
Surr: Toluene-d8	47.16	1.0	50	0	94.3	81 - 120			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-180127		Units: ug/L		Analysis Date: 27-Jan-2018 10:08				
Client ID:		Run ID: VOA2_309702		SeqNo: 4408591		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	48.31	1.0	50	0	96.6	77 - 118				
1,1,1-Trichloroethane	48.93	1.0	50	0	97.9	70 - 130				
1,1,2,2-Tetrachloroethane	44.86	1.0	50	0	89.7	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	48.88	1.0	50	0	97.8	70 - 130				
1,1,2-Trichloroethane	47.05	1.0	50	0	94.1	77 - 113				
1,1-Dichloroethane	47.69	1.0	50	0	95.4	71 - 122				
1,1-Dichloroethene	50.41	1.0	50	0	101	70 - 130				
1,1-Dichloropropene	50.76	1.0	50	0	102	78 - 118				
1,2,3-Trichlorobenzene	50.16	1.0	50	0	100	70 - 130				
1,2,3-Trichloropropane	44.4	1.0	50	0	88.8	70 - 127				
1,2,4-Trichlorobenzene	50.89	1.0	50	0	102	77 - 126				
1,2,4-Trimethylbenzene	40.49	1.0	50	0	81.0	73 - 121				
1,2-Dibromo-3-chloropropane	46.03	1.0	50	0	92.1	70 - 130				
1,2-Dibromoethane	49.93	1.0	50	0	99.9	76 - 123				
1,2-Dichlorobenzene	42.44	1.0	50	0	84.9	77 - 113				
1,2-Dichloroethane	52.48	1.0	50	0	105	70 - 124				
1,2-Dichloropropane	48.1	1.0	50	0	96.2	72 - 119				
1,3,5-Trimethylbenzene	40.85	1.0	50	0	81.7	75 - 118				
1,3-Dichlorobenzene	41.95	1.0	50	0	83.9	78 - 118				
1,3-Dichloropropane	46.13	1.0	50	0	92.3	75 - 116				
1,4-Dichlorobenzene	41.93	1.0	50	0	83.9	79 - 113				
2,2-Dichloropropane	49.4	1.0	50	0	98.8	70 - 130				
2-Butanone	102.3	2.0	100	0	102	70 - 130				
2-Chlorotoluene	39.97	1.0	50	0	79.9	70 - 128				
2-Hexanone	97.5	2.0	100	0	97.5	70 - 130				
4-Chlorotoluene	40.54	1.0	50	0	81.1	74 - 126				
4-Isopropyltoluene	42.68	1.0	50	0	85.4	74 - 126				
4-Methyl-2-pentanone	96.64	2.0	100	0	96.6	70 - 130				
Acetone	108.5	2.0	100	0	108	70 - 130				
Benzene	48.25	1.0	50	0	96.5	74 - 120				
Bromobenzene	41.5	1.0	50	0	83.0	78 - 113				
Bromochloromethane	51.53	1.0	50	0	103	76 - 124				
Bromodichloromethane	49.85	1.0	50	0	99.7	74 - 122				
Bromoform	52.77	1.0	50	0	106	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-180127		Units: ug/L		Analysis Date: 27-Jan-2018 10:08				
Client ID:		Run ID: VOA2_309702		SeqNo: 4408591		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	52.92	1.0	50	0	106	70 - 130				
Carbon disulfide	97.58	2.0	100	0	97.6	70 - 130				
Carbon tetrachloride	42.64	1.0	50	0	85.3	71 - 125				
Chlorobenzene	45.55	1.0	50	0	91.1	76 - 113				
Chloroethane	45.07	1.0	50	0	90.1	70 - 130				
Chloroform	48.02	1.0	50	0	96.0	71 - 121				
Chloromethane	49.42	1.0	50	0	98.8	70 - 129				
cis-1,2-Dichloroethene	49.31	1.0	50	0	98.6	75 - 122				
cis-1,3-Dichloropropene	54.14	1.0	50	0	108	73 - 127				
Dibromochloromethane	49.46	1.0	50	0	98.9	77 - 122				
Dibromomethane	51.57	1.0	50	0	103	78 - 121				
Dichlorodifluoromethane	36.23	1.0	50	0	72.5	70 - 130				
Ethylbenzene	46.06	1.0	50	0	92.1	77 - 117				
Hexachlorobutadiene	46.07	1.0	50	0	92.1	70 - 130				
Isopropylbenzene	46.68	1.0	50	0	93.4	73 - 127				
m,p-Xylene	90.84	2.0	100	0	90.8	77 - 122				
Methylene chloride	47.79	2.0	50	0	95.6	70 - 127				
n-Butylbenzene	44.16	1.0	50	0	88.3	72 - 130				
n-Propylbenzene	41.27	1.0	50	0	82.5	73 - 124				
o-Xylene	46.44	1.0	50	0	92.9	75 - 119				
sec-Butylbenzene	43.68	1.0	50	0	87.4	73 - 128				
Styrene	47.01	1.0	50	0	94.0	72 - 126				
tert-Butylbenzene	42.39	1.0	50	0	84.8	73 - 124				
Tetrachloroethene	50.51	1.0	50	0	101	76 - 119				
Toluene	45.04	1.0	50	0	90.1	77 - 118				
trans-1,2-Dichloroethene	52.65	1.0	50	0	105	72 - 127				
trans-1,3-Dichloropropene	54.99	1.0	50	0	110	77 - 119				
Trichloroethene	51.64	1.0	50	0	103	77 - 121				
Trichlorofluoromethane	44.8	1.0	50	0	89.6	70 - 130				
Vinyl chloride	46.51	1.0	50	0	93.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	46.82	1.0	50	0	93.6	70 - 130				
Surr: 4-Bromofluorobenzene	49.98	1.0	50	0	100.0	82 - 115				
Surr: Dibromofluoromethane	48.96	1.0	50	0	97.9	73 - 126				
Surr: Toluene-d8	45.42	1.0	50	0	90.8	81 - 120				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260					
MS		Sample ID: HS18010891-01MS		Units: ug/L		Analysis Date: 27-Jan-2018 15:28			
Client ID:		Run ID: VOA2_309702		SeqNo: 4408623		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	45.19	1.0	50	0	90.4	70 - 120			
1,1,1-Trichloroethane	50.97	1.0	50	0	102	70 - 130			
1,1,2,2-Tetrachloroethane	45	1.0	50	0	90.0	70 - 123			
1,1,2-Trichlor-1,2,2-trifluoroethane	51.85	1.0	50	0	104	70 - 130			
1,1,2-Trichloroethane	45.15	1.0	50	0	90.3	70 - 117			
1,1-Dichloroethane	171.9	1.0	50	114.3	115	70 - 127			
1,1-Dichloroethene	51.02	1.0	50	0	102	70 - 130			
1,1-Dichloropropene	53.11	1.0	50	0	106	70 - 129			
1,2,3-Trichlorobenzene	46.84	1.0	50	0	93.7	70 - 130			
1,2,3-Trichloropropane	41.98	1.0	50	0	84.0	70 - 130			
1,2,4-Trichlorobenzene	46.91	1.0	50	0	93.8	70 - 125			
1,2,4-Trimethylbenzene	38.89	1.0	50	0	77.8	70 - 125			
1,2-Dibromo-3-chloropropane	43.62	1.0	50	0	87.2	70 - 130			
1,2-Dibromoethane	47.1	1.0	50	0	94.2	70 - 124			
1,2-Dichlorobenzene	40.27	1.0	50	0	80.5	70 - 115			
1,2-Dichloroethane	60.47	1.0	50	10.76	99.4	70 - 127			
1,2-Dichloropropane	46.41	1.0	50	0	92.8	70 - 122			
1,3,5-Trimethylbenzene	40.13	1.0	50	0	80.3	70 - 126			
1,3-Dichlorobenzene	40.05	1.0	50	0	80.1	70 - 119			
1,3-Dichloropropane	43.42	1.0	50	0	86.8	70 - 121			
1,4-Dichlorobenzene	39.98	1.0	50	0	80.0	70 - 114			
2,2-Dichloropropane	48.45	1.0	50	0	96.9	70 - 130			
2-Butanone	100.8	2.0	100	0	101	70 - 130			
2-Chlorotoluene	38.7	1.0	50	0	77.4	70 - 130			
2-Hexanone	94.13	2.0	100	0	94.1	70 - 130			
4-Chlorotoluene	38.93	1.0	50	0	77.9	70 - 130			
4-Isopropyltoluene	41.49	1.0	50	0	83.0	70 - 130			
4-Methyl-2-pentanone	93.41	2.0	100	0	93.4	70 - 130			
Acetone	108	2.0	100	0	108	70 - 130			
Benzene	47.37	1.0	50	0	94.7	70 - 127			
Bromobenzene	39.5	1.0	50	0	79.0	70 - 115			
Bromochloromethane	48.78	1.0	50	0	97.6	70 - 127			
Bromodichloromethane	47.53	1.0	50	0	95.1	70 - 124			
Bromoform	48.25	1.0	50	0	96.5	70 - 129			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260						
MS	Sample ID: HS18010891-01MS	Units: ug/L			Analysis Date: 27-Jan-2018 15:28					
Client ID:	Run ID: VOA2_309702	SeqNo: 4408623		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	52.31	1.0	50	0	105	70 - 130				
Carbon disulfide	97.42	2.0	100	0	97.4	70 - 130				
Carbon tetrachloride	42.74	1.0	50	0	85.5	70 - 130				
Chlorobenzene	43.18	1.0	50	0	86.4	70 - 114				
Chloroethane	44.49	1.0	50	0	89.0	70 - 130				
Chloroform	47.7	1.0	50	0	95.4	70 - 125				
Chloromethane	47.05	1.0	50	0	94.1	70 - 130				
cis-1,2-Dichloroethene	49.89	1.0	50	0	99.8	70 - 128				
cis-1,3-Dichloropropene	50.69	1.0	50	0	101	70 - 125				
Dibromochloromethane	46.37	1.0	50	0	92.7	70 - 124				
Dibromomethane	49.5	1.0	50	0	99.0	70 - 124				
Dichlorodifluoromethane	38.97	1.0	50	0	77.9	70 - 130				
Ethylbenzene	44.75	1.0	50	0	89.5	70 - 124				
Hexachlorobutadiene	44.48	1.0	50	0	89.0	70 - 130				
Isopropylbenzene	45.57	1.0	50	0	91.1	70 - 130				
m,p-Xylene	87.78	2.0	100	0	87.8	70 - 130				
Methylene chloride	45.46	2.0	50	0	90.9	70 - 128				
n-Butylbenzene	42.63	1.0	50	0	85.3	70 - 130				
n-Propylbenzene	40.43	1.0	50	0	80.9	70 - 130				
o-Xylene	44.18	1.0	50	0	88.4	70 - 124				
sec-Butylbenzene	42.39	1.0	50	0	84.8	70 - 130				
Styrene	44.31	1.0	50	0	88.6	70 - 130				
tert-Butylbenzene	41.85	1.0	50	0	83.7	70 - 130				
Tetrachloroethene	50.43	1.0	50	0	101	70 - 130				
Toluene	43.91	1.0	50	0	87.8	70 - 123				
trans-1,2-Dichloroethene	53.65	1.0	50	0	107	70 - 130				
trans-1,3-Dichloropropene	50.37	1.0	50	0	101	70 - 121				
Trichloroethene	49.28	1.0	50	0	98.6	70 - 129				
Trichlorofluoromethane	47.04	1.0	50	0	94.1	70 - 130				
Vinyl chloride	49	1.0	50	0	98.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	47.71	1.0	50	0	95.4	70 - 126				
Surr: 4-Bromofluorobenzene	48.87	1.0	50	0	97.7	81 - 113				
Surr: Dibromofluoromethane	49.94	1.0	50	0	99.9	77 - 123				
Surr: Toluene-d8	45.13	1.0	50	0	90.3	82 - 127				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260	
MS		Sample ID: HS18010689-02MS	Units: ug/L	Analysis Date: 27-Jan-2018 16:18	
Client ID: 17WW19-011518		Run ID: VOA2_309702	SeqNo: 4408625	PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC Control Limit RPD Ref Value %RPD Limit Qual
1,1,1,2-Tetrachloroethane	43.96	1.0	50	0	87.9 70 - 120
1,1,1-Trichloroethane	49.93	1.0	50	0	99.9 70 - 130
1,1,2,2-Tetrachloroethane	44.22	1.0	50	0	88.4 70 - 123
1,1,2-Trichlor-1,2,2-trifluoroethane	52.42	1.0	50	0	105 70 - 130
1,1,2-Trichloroethane	42.38	1.0	50	0	84.8 70 - 117
1,1-Dichloroethane	46.55	1.0	50	0	93.1 70 - 127
1,1-Dichloroethene	52.38	1.0	50	0	105 70 - 130
1,1-Dichloropropene	52.38	1.0	50	0	105 70 - 129
1,2,3-Trichlorobenzene	48	1.0	50	0	96.0 70 - 130
1,2,3-Trichloropropane	41.11	1.0	50	0	82.2 70 - 130
1,2,4-Trichlorobenzene	48.12	1.0	50	0	96.2 70 - 125
1,2,4-Trimethylbenzene	38.6	1.0	50	0	77.2 70 - 125
1,2-Dibromo-3-chloropropane	43.2	1.0	50	0	86.4 70 - 130
1,2-Dibromoethane	45.24	1.0	50	0	90.5 70 - 124
1,2-Dichlorobenzene	39.18	1.0	50	0	78.4 70 - 115
1,2-Dichloroethane	48.29	1.0	50	0	96.6 70 - 127
1,2-Dichloropropane	45.48	1.0	50	0	91.0 70 - 122
1,3,5-Trimethylbenzene	39.47	1.0	50	0	78.9 70 - 126
1,3-Dichlorobenzene	40.18	1.0	50	0	80.4 70 - 119
1,3-Dichloropropane	42.27	1.0	50	0	84.5 70 - 121
1,4-Dichlorobenzene	39.55	1.0	50	0	79.1 70 - 114
2,2-Dichloropropane	46.8	1.0	50	0	93.6 70 - 130
2-Butanone	96.89	2.0	100	0	96.9 70 - 130
2-Chlorotoluene	38.51	1.0	50	0	77.0 70 - 130
2-Hexanone	89.43	2.0	100	0	89.4 70 - 130
4-Chlorotoluene	38.93	1.0	50	0	77.9 70 - 130
4-Isopropyltoluene	41.8	1.0	50	0	83.6 70 - 130
4-Methyl-2-pentanone	89.11	2.0	100	0	89.1 70 - 130
Acetone	95.32	2.0	100	0	95.3 70 - 130
Benzene	46.96	1.0	50	0	93.9 70 - 127
Bromobenzene	39.08	1.0	50	0	78.2 70 - 115
Bromochloromethane	48.9	1.0	50	0	97.8 70 - 127
Bromodichloromethane	46.71	1.0	50	0	93.4 70 - 124
Bromoform	46.96	1.0	50	0	93.9 70 - 129

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260					
MS		Sample ID: HS18010689-02MS		Units: ug/L		Analysis Date: 27-Jan-2018 16:18			
Client ID: 17WW19-011518		Run ID: VOA2_309702		SeqNo: 4408625		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	52.69	1.0	50	0	105	70 - 130			
Carbon disulfide	98.11	2.0	100	0	98.1	70 - 130			
Carbon tetrachloride	44.81	1.0	50	0	89.6	70 - 130			
Chlorobenzene	42.39	1.0	50	0	84.8	70 - 114			
Chloroethane	44.84	1.0	50	0	89.7	70 - 130			
Chloroform	46.51	1.0	50	0	93.0	70 - 125			
Chloromethane	46.7	1.0	50	0	93.4	70 - 130			
cis-1,2-Dichloroethene	47.13	1.0	50	0	94.3	70 - 128			
cis-1,3-Dichloropropene	49.65	1.0	50	0	99.3	70 - 125			
Dibromochloromethane	44.53	1.0	50	0	89.1	70 - 124			
Dibromomethane	49.56	1.0	50	0	99.1	70 - 124			
Dichlorodifluoromethane	41.64	1.0	50	0	83.3	70 - 130			
Ethylbenzene	43.43	1.0	50	0	86.9	70 - 124			
Hexachlorobutadiene	46.29	1.0	50	0	92.6	70 - 130			
Isopropylbenzene	45.46	1.0	50	0	90.9	70 - 130			
m,p-Xylene	86.79	2.0	100	0	86.8	70 - 130			
Methylene chloride	43.68	2.0	50	0	87.4	70 - 128			
n-Butylbenzene	43.28	1.0	50	0	86.6	70 - 130			
n-Propylbenzene	40.89	1.0	50	0	81.8	70 - 130			
o-Xylene	43.48	1.0	50	0	87.0	70 - 124			
sec-Butylbenzene	42.96	1.0	50	0	85.9	70 - 130			
Styrene	43.42	1.0	50	0	86.8	70 - 130			
tert-Butylbenzene	41.71	1.0	50	0	83.4	70 - 130			
Tetrachloroethene	49.59	1.0	50	0	99.2	70 - 130			
Toluene	43.04	1.0	50	0	86.1	70 - 123			
trans-1,2-Dichloroethene	52.99	1.0	50	0	106	70 - 130			
trans-1,3-Dichloropropene	50.19	1.0	50	0	100	70 - 121			
Trichloroethene	49.18	1.0	50	0	98.4	70 - 129			
Trichlorofluoromethane	49.17	1.0	50	0	98.3	70 - 130			
Vinyl chloride	49.5	1.0	50	0	99.0	70 - 130			
Surr: 1,2-Dichloroethane-d4	47.86	1.0	50	0	95.7	70 - 126			
Surr: 4-Bromofluorobenzene	49.19	1.0	50	0	98.4	81 - 113			
Surr: Dibromofluoromethane	49.3	1.0	50	0	98.6	77 - 123			
Surr: Toluene-d8	45.2	1.0	50	0	90.4	82 - 127			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260						
MSD		Sample ID: HS18010891-01MSD		Units: ug/L		Analysis Date: 27-Jan-2018 15:53				
Client ID:		Run ID: VOA2_309702		SeqNo: 4408624		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	46.33	1.0	50	0	92.7	70 - 120	45.19	2.48	20	
1,1,1-Trichloroethane	53.15	1.0	50	0	106	70 - 130	50.97	4.19	20	
1,1,2,2-Tetrachloroethane	44.95	1.0	50	0	89.9	70 - 123	45	0.111	20	
1,1,2-Trichloro-1,2,2-trifluoroethane	52.59	1.0	50	0	105	70 - 130	51.85	1.42	20	
1,1,2-Trichloroethane	45.82	1.0	50	0	91.6	70 - 117	45.15	1.47	20	
1,1-Dichloroethane	156.9	1.0	50	114.3	85.1	70 - 127	171.9	9.11	20	
1,1-Dichloroethene	55.01	1.0	50	0	110	70 - 130	51.02	7.53	20	
1,1-Dichloropropene	54.86	1.0	50	0	110	70 - 129	53.11	3.24	20	
1,2,3-Trichlorobenzene	50	1.0	50	0	100.0	70 - 130	46.84	6.52	20	
1,2,3-Trichloropropane	42.58	1.0	50	0	85.2	70 - 130	41.98	1.41	20	
1,2,4-Trichlorobenzene	49.33	1.0	50	0	98.7	70 - 125	46.91	5.03	20	
1,2,4-Trimethylbenzene	40.04	1.0	50	0	80.1	70 - 125	38.89	2.91	20	
1,2-Dibromo-3-chloropropane	44.42	1.0	50	0	88.8	70 - 130	43.62	1.81	20	
1,2-Dibromoethane	48.37	1.0	50	0	96.7	70 - 124	47.1	2.67	20	
1,2-Dichlorobenzene	41.35	1.0	50	0	82.7	70 - 115	40.27	2.64	20	
1,2-Dichloroethane	61.08	1.0	50	10.76	101	70 - 127	60.47	1.01	20	
1,2-Dichloropropane	47.69	1.0	50	0	95.4	70 - 122	46.41	2.72	20	
1,3,5-Trimethylbenzene	40.83	1.0	50	0	81.7	70 - 126	40.13	1.72	20	
1,3-Dichlorobenzene	41.64	1.0	50	0	83.3	70 - 119	40.05	3.9	20	
1,3-Dichloropropane	44.21	1.0	50	0	88.4	70 - 121	43.42	1.8	20	
1,4-Dichlorobenzene	41.65	1.0	50	0	83.3	70 - 114	39.98	4.1	20	
2,2-Dichloropropane	49.21	1.0	50	0	98.4	70 - 130	48.45	1.57	20	
2-Butanone	102	2.0	100	0	102	70 - 130	100.8	1.15	20	
2-Chlorotoluene	39.76	1.0	50	0	79.5	70 - 130	38.7	2.7	20	
2-Hexanone	93.24	2.0	100	0	93.2	70 - 130	94.13	0.951	20	
4-Chlorotoluene	39.79	1.0	50	0	79.6	70 - 130	38.93	2.17	20	
4-Isopropyltoluene	43.17	1.0	50	0	86.3	70 - 130	41.49	3.97	20	
4-Methyl-2-pentanone	92.75	2.0	100	0	92.7	70 - 130	93.41	0.711	20	
Acetone	108.8	2.0	100	0	109	70 - 130	108	0.701	20	
Benzene	49.34	1.0	50	0	98.7	70 - 127	47.37	4.07	20	
Bromobenzene	40.55	1.0	50	0	81.1	70 - 115	39.5	2.62	20	
Bromochloromethane	50.52	1.0	50	0	101	70 - 127	48.78	3.51	20	
Bromodichloromethane	48.57	1.0	50	0	97.1	70 - 124	47.53	2.17	20	
Bromoform	49.76	1.0	50	0	99.5	70 - 129	48.25	3.1	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260					
MSD	Sample ID: HS18010891-01MSD	Units: ug/L		Analysis Date: 27-Jan-2018 15:53					
Client ID:	Run ID: VOA2_309702	SeqNo: 4408624		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	53.97	1.0	50	0	108	70 - 130	52.31	3.12	20
Carbon disulfide	101.4	2.0	100	0	101	70 - 130	97.42	3.98	20
Carbon tetrachloride	44.71	1.0	50	0	89.4	70 - 130	42.74	4.52	20
Chlorobenzene	44.67	1.0	50	0	89.3	70 - 114	43.18	3.4	20
Chloroethane	47.15	1.0	50	0	94.3	70 - 130	44.49	5.8	20
Chloroform	49.44	1.0	50	0	98.9	70 - 125	47.7	3.58	20
Chloromethane	48.26	1.0	50	0	96.5	70 - 130	47.05	2.54	20
cis-1,2-Dichloroethene	51.87	1.0	50	0	104	70 - 128	49.89	3.89	20
cis-1,3-Dichloropropene	51.51	1.0	50	0	103	70 - 125	50.69	1.59	20
Dibromochloromethane	46.81	1.0	50	0	93.6	70 - 124	46.37	0.927	20
Dibromomethane	50.29	1.0	50	0	101	70 - 124	49.5	1.6	20
Dichlorodifluoromethane	38.1	1.0	50	0	76.2	70 - 130	38.97	2.26	20
Ethylbenzene	45.64	1.0	50	0	91.3	70 - 124	44.75	1.96	20
Hexachlorobutadiene	47.49	1.0	50	0	95.0	70 - 130	44.48	6.54	20
Isopropylbenzene	46.85	1.0	50	0	93.7	70 - 130	45.57	2.78	20
m,p-Xylene	89.69	2.0	100	0	89.7	70 - 130	87.78	2.15	20
Methylene chloride	46.85	2.0	50	0	93.7	70 - 128	45.46	3.01	20
n-Butylbenzene	43.74	1.0	50	0	87.5	70 - 130	42.63	2.55	20
n-Propylbenzene	42	1.0	50	0	84.0	70 - 130	40.43	3.81	20
o-Xylene	45.51	1.0	50	0	91.0	70 - 124	44.18	2.96	20
sec-Butylbenzene	43.78	1.0	50	0	87.6	70 - 130	42.39	3.23	20
Styrene	45.75	1.0	50	0	91.5	70 - 130	44.31	3.21	20
tert-Butylbenzene	42.89	1.0	50	0	85.8	70 - 130	41.85	2.43	20
Tetrachloroethene	51.48	1.0	50	0	103	70 - 130	50.43	2.07	20
Toluene	45.27	1.0	50	0	90.5	70 - 123	43.91	3.05	20
trans-1,2-Dichloroethene	56.79	1.0	50	0	114	70 - 130	53.65	5.68	20
trans-1,3-Dichloropropene	51.49	1.0	50	0	103	70 - 121	50.37	2.19	20
Trichloroethene	51.18	1.0	50	0	102	70 - 129	49.28	3.77	20
Trichlorofluoromethane	50.6	1.0	50	0	101	70 - 130	47.04	7.29	20
Vinyl chloride	49.17	1.0	50	0	98.3	70 - 130	49	0.346	20
Surr: 1,2-Dichloroethane-d4	48.95	1.0	50	0	97.9	70 - 126	47.71	2.56	20
Surr: 4-Bromofluorobenzene	49.33	1.0	50	0	98.7	81 - 113	48.87	0.937	20
Surr: Dibromofluoromethane	50.56	1.0	50	0	101	77 - 123	49.94	1.23	20
Surr: Toluene-d8	44.77	1.0	50	0	89.5	82 - 127	45.13	0.793	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260					
MSD		Sample ID: HS18010689-02MSD		Units: ug/L		Analysis Date: 27-Jan-2018 16:42			
Client ID: 17WW19-011518		Run ID: VOA2_309702		SeqNo: 4408626		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	45.29	1.0	50	0	90.6	70 - 120	43.96	2.99	20
1,1,1-Trichloroethane	52.13	1.0	50	0	104	70 - 130	49.93	4.31	20
1,1,2,2-Tetrachloroethane	45.13	1.0	50	0	90.3	70 - 123	44.22	2.03	20
1,1,2-Trichloro-1,2,2-trifluoroethane	52.42	1.0	50	0	105	70 - 130	52.42	0.00669	20
1,1,2-Trichloroethane	44.38	1.0	50	0	88.8	70 - 117	42.38	4.63	20
1,1-Dichloroethane	49.12	1.0	50	0	98.2	70 - 127	46.55	5.37	20
1,1-Dichloroethene	54.55	1.0	50	0	109	70 - 130	52.38	4.07	20
1,1-Dichloropropene	55.02	1.0	50	0	110	70 - 129	52.38	4.92	20
1,2,3-Trichlorobenzene	50.96	1.0	50	0	102	70 - 130	48	5.97	20
1,2,3-Trichloropropane	41.89	1.0	50	0	83.8	70 - 130	41.11	1.87	20
1,2,4-Trichlorobenzene	49.87	1.0	50	0	99.7	70 - 125	48.12	3.56	20
1,2,4-Trimethylbenzene	40.38	1.0	50	0	80.8	70 - 125	38.6	4.5	20
1,2-Dibromo-3-chloropropane	43.76	1.0	50	0	87.5	70 - 130	43.2	1.28	20
1,2-Dibromoethane	46.57	1.0	50	0	93.1	70 - 124	45.24	2.89	20
1,2-Dichlorobenzene	41.29	1.0	50	0	82.6	70 - 115	39.18	5.25	20
1,2-Dichloroethane	50.07	1.0	50	0	100	70 - 127	48.29	3.62	20
1,2-Dichloropropane	46.63	1.0	50	0	93.3	70 - 122	45.48	2.5	20
1,3,5-Trimethylbenzene	40.98	1.0	50	0	82.0	70 - 126	39.47	3.74	20
1,3-Dichlorobenzene	41.42	1.0	50	0	82.8	70 - 119	40.18	3.04	20
1,3-Dichloropropane	43.79	1.0	50	0	87.6	70 - 121	42.27	3.54	20
1,4-Dichlorobenzene	41.21	1.0	50	0	82.4	70 - 114	39.55	4.11	20
2,2-Dichloropropane	48.47	1.0	50	0	96.9	70 - 130	46.8	3.5	20
2-Butanone	98.21	2.0	100	0	98.2	70 - 130	96.89	1.36	20
2-Chlorotoluene	39.55	1.0	50	0	79.1	70 - 130	38.51	2.65	20
2-Hexanone	92.58	2.0	100	0	92.6	70 - 130	89.43	3.46	20
4-Chlorotoluene	40.29	1.0	50	0	80.6	70 - 130	38.93	3.43	20
4-Isopropyltoluene	43.53	1.0	50	0	87.1	70 - 130	41.8	4.04	20
4-Methyl-2-pentanone	92.22	2.0	100	0	92.2	70 - 130	89.11	3.43	20
Acetone	101.5	2.0	100	0	102	70 - 130	95.32	6.28	20
Benzene	48.26	1.0	50	0	96.5	70 - 127	46.96	2.73	20
Bromobenzene	40.74	1.0	50	0	81.5	70 - 115	39.08	4.14	20
Bromochloromethane	50.67	1.0	50	0	101	70 - 127	48.9	3.56	20
Bromodichloromethane	47.71	1.0	50	0	95.4	70 - 124	46.71	2.11	20
Bromoform	48.79	1.0	50	0	97.6	70 - 129	46.96	3.84	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702		Instrument: VOA2		Method: SW8260					
MSD		Sample ID: HS18010689-02MSD		Units: ug/L		Analysis Date: 27-Jan-2018 16:42			
Client ID: 17WW19-011518		Run ID: VOA2_309702		SeqNo: 4408626		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	53.47	1.0	50	0	107	70 - 130	52.69	1.49	20
Carbon disulfide	101	2.0	100	0	101	70 - 130	98.11	2.9	20
Carbon tetrachloride	45.63	1.0	50	0	91.3	70 - 130	44.81	1.83	20
Chlorobenzene	44.48	1.0	50	0	89.0	70 - 114	42.39	4.81	20
Chloroethane	44.68	1.0	50	0	89.4	70 - 130	44.84	0.348	20
Chloroform	48.03	1.0	50	0	96.1	70 - 125	46.51	3.23	20
Chloromethane	47.59	1.0	50	0	95.2	70 - 130	46.7	1.9	20
cis-1,2-Dichloroethene	48.9	1.0	50	0	97.8	70 - 128	47.13	3.68	20
cis-1,3-Dichloropropene	50.6	1.0	50	0	101	70 - 125	49.65	1.89	20
Dibromochloromethane	46.83	1.0	50	0	93.7	70 - 124	44.53	5.05	20
Dibromomethane	49.56	1.0	50	0	99.1	70 - 124	49.56	0.0086	20
Dichlorodifluoromethane	41.5	1.0	50	0	83.0	70 - 130	41.64	0.328	20
Ethylbenzene	45.49	1.0	50	0	91.0	70 - 124	43.43	4.61	20
Hexachlorobutadiene	48.99	1.0	50	0	98.0	70 - 130	46.29	5.68	20
Isopropylbenzene	47.13	1.0	50	0	94.3	70 - 130	45.46	3.61	20
m,p-Xylene	90.73	2.0	100	0	90.7	70 - 130	86.79	4.43	20
Methylene chloride	46.35	2.0	50	0	92.7	70 - 128	43.68	5.93	20
n-Butylbenzene	45.51	1.0	50	0	91.0	70 - 130	43.28	5.03	20
n-Propylbenzene	42.42	1.0	50	0	84.8	70 - 130	40.89	3.69	20
o-Xylene	45.14	1.0	50	0	90.3	70 - 124	43.48	3.75	20
sec-Butylbenzene	44.28	1.0	50	0	88.6	70 - 130	42.96	3.02	20
Styrene	45.15	1.0	50	0	90.3	70 - 130	43.42	3.91	20
tert-Butylbenzene	42.56	1.0	50	0	85.1	70 - 130	41.71	2.03	20
Tetrachloroethene	51.97	1.0	50	0	104	70 - 130	49.59	4.67	20
Toluene	44.66	1.0	50	0	89.3	70 - 123	43.04	3.7	20
trans-1,2-Dichloroethene	54.91	1.0	50	0	110	70 - 130	52.99	3.57	20
trans-1,3-Dichloropropene	51.58	1.0	50	0	103	70 - 121	50.19	2.75	20
Trichloroethene	49.68	1.0	50	0	99.4	70 - 129	49.18	1.03	20
Trichlorofluoromethane	51.27	1.0	50	0	103	70 - 130	49.17	4.17	20
Vinyl chloride	50.56	1.0	50	0	101	70 - 130	49.5	2.12	20
Surr: 1,2-Dichloroethane-d4	47.6	1.0	50	0	95.2	70 - 126	47.86	0.551	20
Surr: 4-Bromofluorobenzene	49.88	1.0	50	0	99.8	81 - 113	49.19	1.39	20
Surr: Dibromofluoromethane	49.56	1.0	50	0	99.1	77 - 123	49.3	0.521	20
Surr: Toluene-d8	45.24	1.0	50	0	90.5	82 - 127	45.2	0.0913	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309702	Instrument: VOA2	Method: SW8260
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The following samples were analyzed in this batch:

HS18010689-01	HS18010689-02	HS18010689-03
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Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309787		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW-180128	Units: ug/L		Analysis Date: 29-Jan-2018 12:09					
Client ID:	Run ID: VOA2_309787	SeqNo: 4410857		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Naphthalene	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	46.74	1.0	50	0	93.5	70 - 123			
Surr: 4-Bromofluorobenzene	47.88	1.0	50	0	95.8	82 - 115			
Surr: Dibromofluoromethane	51.98	1.0	50	0	104	73 - 126			
Surr: Toluene-d8	46.37	1.0	50	0	92.7	81 - 120			

LCS	Sample ID: VLCSW-180128	Units: ug/L		Analysis Date: 29-Jan-2018 11:20					
Client ID:	Run ID: VOA2_309787	SeqNo: 4410855		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Naphthalene	47.47	1.0	50	0	94.9	70 - 130			
Surr: 1,2-Dichloroethane-d4	47.69	1.0	50	0	95.4	70 - 130			
Surr: 4-Bromofluorobenzene	49.98	1.0	50	0	100.0	82 - 115			
Surr: Dibromofluoromethane	49.06	1.0	50	0	98.1	73 - 126			
Surr: Toluene-d8	45.34	1.0	50	0	90.7	81 - 120			

MS	Sample ID: HS18010689-02MS	Units: ug/L		Analysis Date: 29-Jan-2018 14:12					
Client ID: 17WW19-011518	Run ID: VOA2_309787	SeqNo: 4410862		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Naphthalene	39.75	1.0	50	0	79.5	70 - 130			
Surr: 1,2-Dichloroethane-d4	47.95	1.0	50	0	95.9	70 - 126			
Surr: 4-Bromofluorobenzene	48.81	1.0	50	0	97.6	81 - 113			
Surr: Dibromofluoromethane	50.89	1.0	50	0	102	77 - 123			
Surr: Toluene-d8	45.26	1.0	50	0	90.5	82 - 127			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

QC BATCH REPORT

Batch ID: R309787		Instrument: VOA2		Method: SW8260						
MSD		Sample ID: HS18010689-02MSD		Units: ug/L		Analysis Date: 29-Jan-2018 14:36				
Client ID: 17WW19-011518		Run ID: VOA2_309787		SeqNo: 4410863		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Naphthalene	40.36	1.0	50	0	80.7	70 - 130	39.75	1.53	20	
Surr: 1,2-Dichloroethane-d4	46.69	1.0	50	0	93.4	70 - 126	47.95	2.65	20	
Surr: 4-Bromofluorobenzene	49	1.0	50	0	98.0	81 - 113	48.81	0.39	20	
Surr: Dibromofluoromethane	50.52	1.0	50	0	101	77 - 123	50.89	0.741	20	
Surr: Toluene-d8	45.17	1.0	50	0	90.3	82 - 127	45.26	0.199	20	
The following samples were analyzed in this batch:		HS18010689-01		HS18010689-02		HS18010689-03				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 01-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010689

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group USA, Corp

Date: 01-Feb-18

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18010689

Date/Time Received: **17-Jan-2018 10:00**
Received by: **RPG**

Checklist completed by: Paresh M. Giga 18-Jan-2018
eSignature Date

Reviewed by: RJ Modashia 19-Jan-2018
eSignature Date

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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.9c/0.4c U/C IR11

Cooler(s)/Kit(s): 43452

Date/Time sample(s) sent to storage: 1/18/18 15:55

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:

RUSH:

OTHER INFO

FedInvoices@CBIFederalServices.com

Email Report To: Sharon.Pennington@CBIFederalServices.com

Mail Reports To Sharon Pennington

Address	2410 Cherahala Blvd.
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State	TN
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Country	USA
---------	-----

Phone Number	281.575.2132 or 281.530.5656
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FEDEX

ANALYSIS REQUESTED

ANALYSIS

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2

1

4

Abstract

4

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4

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DATE/TIME

10:00

43452 0.9C IR 11 CF-0.5

CUSTODY SEAL *SM*DATE: 1/15/18 *01/17/18*Signature: *DR*

43452 LHAAP

43452 JAN 17 2018

FedEx
TRK# 7376 9751 5918
0221TUE - 16 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA

43452

77099

TX-US IAH





Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1801949; 1802229

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2040 (207523)

General Set Information: There were three field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (LMB 585118) was less than 1/2 the CRDL. The recovery for the LCS (585119) was within acceptable parameters.

MS/MSD Analysis: The matrix spike and matrix spike duplicate (MS/MSD) was performed on samples 1801949002/03 (Client ID: 17WW19-011518). The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.



NC/CAR(s): NA

Sample Calculation: Samples were reported in $\mu\text{g/L}$. Results were calculated in $\mu\text{g/L}$ by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve ($\mu\text{g/L}$)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1. Manual Integrations were performed for some of the Initial Calibration analyses (datafiles: 28NOVP01/02) along with datafiles 29JAND02/04/11/13/14.

<u>Thomas Bosch</u>	<u>January 29, 2018</u>
Analyst	Date



ANALYTICAL REPORT

Report Date: February 01, 2018

RJ Masahisa
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1801949**

Project ID: HS18010689 011518

Purchase Order: HS18010689

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
17WW19-011518	1801949001	01/15/18	01/19/18	
17WW19-011518-FD	1801949004	01/15/18	01/19/18	
Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
17WW19-011518MS	1801949002	01/15/18	01/19/18	
17WW19-011518MSD	1801949003	01/15/18	01/19/18	

*Client QC is reported as part of the Quality Control results report, if requested.



ANALYTICAL REPORT

Workorder: **34-1801949**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 17WW19-011518			Sampling Site: NA		Collected: 01/15/2018	
Lab ID: 1801949001			Media: 125 mL Nalgene		Received: 01/19/2018	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2040 (HBN: 207523) Analyzed: 01/29/2018 10:13		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: 17WW19-011518-FD			Sampling Site: NA		Collected: 01/15/2018	
Lab ID: 1801949004			Media: 125 mL Nalgene		Received: 01/19/2018	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2040 (HBN: 207523) Analyzed: 01/29/2018 10:57		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 01/29/2018 16:56	/S/ Stephen Brose 02/01/2018 09:10

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: als@alstglobal.com
Web: www.alstglobal.com



ANALYTICAL REPORT

Workorder: **34-1801949**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint ,Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com



ANALYTICAL REPORT

Workorder: 34-1801949

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< This testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00898755

Analysis Information

Workorder: 1801949

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850

Basis: DoD QSM

Batch: NA

Batch: ELMS/2040 (HBN: 207523)

Prepared By: NA

Analyzed By: Thomas Bosch

Blank

LMB: 585118

Analyzed: 01/29/2018 09:43

Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 585119

Analyzed: 01/29/2018 09:57

Dilution: 1

Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	5.20	5.00	104	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1801949001

Analyzed: 01/29/2018 10:13

Dilution: 1

Units: ug/L

MS: 1801949002

Analyzed: 01/29/2018 10:28

Dilution: 1

Units: ug/L

MSD: 1801949003

Analyzed: 01/29/2018 10:42

Dilution: 1

Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.4	5	88.0	78.8	123.8	4.37	87.4	0.707	0.0	20.0

Continuing Calibration Verification

CCV: 585115

Analyzed: 01/29/2018 09:12

Units: ug/L

Criteria: $\pm 15\%$
CCV: 585120

Analyzed: 01/29/2018 11:58

Units: ug/L

Criteria: $\pm 15\%$

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	26.5	25.0	106	21.5	25.0	85.9

Interference Check Sample

ICSA: 585117

Analyzed: 01/29/2018 09:28

Units: ug/L

Criteria: $\pm 30\%$

Analyte	Result	Target	% Rec.
Perchlorate	0.971	1.00	97.1

Limit of Detection Verification

LODV: 585116

Analyzed: 01/29/2018 08:53

Units: ug/L

Criteria: $\pm 50\%$
LODV: 585121

Analyzed: 01/29/2018 11:41

Units: ug/L

Criteria: $\pm 50\%$

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	1.23	1.00	123	1.29	1.00	129



Quality Control Sample Batch Report

00898756

Analysis Information

Workorder: 1801949

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850

Basis: DoD QSM

Batch: NA

Batch: ELMS/2040 (HBN: 207523)

Prepared By: NA

Analyzed By: Thomas Bosch

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 01/29/2018 16:56	/S/ Stephen Brose 02/01/2018 09:08

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable



18098/2

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

COC ID: 8393

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Sonia West
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Sonia.West@alsglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS18010689
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS18010689-02	17WW19-011518 - MS/MSD	Water	15 Jan 2018 11:05
	SUB_Perch-6850			31 Jan 2018
2.	HS18010689-03	17WW19-011518-FD ✓	Water	15 Jan 2018 11:05
	SUB_Perch-6850			31 Jan 2018

3 containers

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

**Please run MS/MSD
on Sample HS18010689-02**

Relinquished By: S. Maitan
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 1/18/18 18:00
Date/Time: 01/19/2018 10:05
Temperature(s): _____

DRINK SOLUTIONS, DRINK & WATER

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)
COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>1801949</u>	
Date/Time of Receipt: <u>01/19/2018 11:05</u>		Number of Coolers Received: <u>1</u>	
Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Intact/Broken/NA	VOA Headspace Present?	Yes/No/NA
	Yes/No/NA		
	Frozen/Melted/NA		
pH Check Performed:	Metals Yes/No/NA	Total Phenolics Yes/No/NA	NO3/NO2 Yes/No/NA
	Cyanide Yes/No/NA	TPH - 418.1 Yes/No/NA	Oil & Grease Yes/No/NA
	Sulfide Yes/No/NA	COD Yes/No/NA	Total Phosphorous Yes/No/NA
	Ammonia Yes/No/NA	TKN Yes/No/NA	Gross A.B, Gamma Spec Yes/No/NA
Cooler Received	DCL Cooler No.	Temp.	Cooler Received
			DCL Cooler No.
			Temp.
1	C18 8181	2 °C	4
			C18
			°C
2	C18	°C	5
			C18
			°C
3	C18	°C	6
			C18
			°C
Taken By: <u>W. Schmitt</u> <u>Marianne Schmitt</u> <u>01/19/2018</u>			
Signature Printed Name Date			

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

3 containers for sample HS18010689-02
for ms/msd

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____

Printed Name

Signature



ORIGIN ID:SGRA (281) 530-5656
 SHIPPING DEPT
 ALS LABORATORY GROUP
 10450 STANCLIFF RD
 SUITE 210
 HOUSTON, TX 77099
 UNITED STATES US

SHIP DATE: 18JAN18
 ACTWGT: 9.15 LB
 CAD: 300130/CAFE3108
 DIMS: 14x11x10 IN

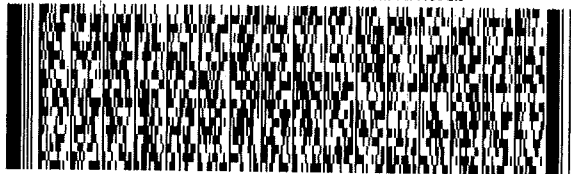
BILL SENDER

TO **PAUL POPE**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS18010689 SW



FedEx
Express

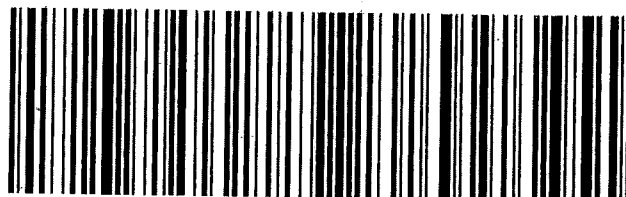


TRK# 7376 9751 7689
 0201

FRI - 19 JAN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
 UT-US **SLC**





CHAIN-OF-CUSTODY

00898760

Project / Job / Task: HS18010689			Split:		Workorder ID: 1801949		Level: ENV_LVL4		Requested Analysis													
Client: ALS Environmental (Houston)					Account: 8101			Type: 125Poly		EPA 8850, DoD QSM												
Comments:					Preservatives			Cool														
					Containers		ID(s)		Count													
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix																	
1	01/15/2018 11:05	17WW19-011518	1801949001		Water	A		1		A												
2	01/15/2018 11:05	17WW19-011518MS	1801949002	MS	Water	A		1		A												
3	01/15/2018 11:05	17WW19-011518MSD	1801949003	MSD	Water	A		1		A												
4	01/15/2018 11:05	17WW19-011518-FD	1801949004		Water	A		1		A												
5																						
6																						
7																						
8																						
9																						
10																						

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____
Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	01/19/2018 10:05	ALS Sample Receiving	Sample Login				
<i>Julie Warath</i>	1/19/18 1330	<i>SB</i>	<i>Storage</i>				
<i>R-33.1</i>	<i>1.26.18/10:25</i>	<i>T. Bush</i>	<i>6850</i>				



Batch Worklist

Batch: ELMS/ 2040

Created: 1/26/2018 12:56

Instrument:

HBN: 207523

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP



Workorder: 1801949 [ENV_LVL4]

Workorder: 1802229 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	585115	CCV for HBN 207523 [ELMS/2040]				CCV	3		E685041C3Q	5311		2/2/2018	
2	585116	LODV for HBN 207523 [ELMS/2040]				LODV	3		E6850.D3Q	5311		2/2/2018	
3	585117	ICS for HBN 207523 [ELMS/2040]				ICS	3		E6850.D3Q	5311		2/2/2018	
4	585118	LMB for HBN 207523 [ELMS/2040]				LMB	3		E6850Q413Q	5311		2/2/2018	
5	585119	LCS for HBN 207523 [ELMS/2040]				LCS	3		E6850Q413Q	5311		2/2/2018	
6	1801949001	17WW19-011518				SAMPLE	3	1801949001-A	E6850Q41.3	5480	2/12/2018	2/2/2018	
7	1801949002	17WW19-011518MS				MS	3	1801949002-A	E6850Q413Q	5480		2/2/2018	
8	1801949003	17WW19-011518MSD				MSD	3	1801949003-A	E6850Q413Q	5480		2/2/2018	
9	1801949004	17WW19-011518-FD				SAMPLE	3	1801949004-A	E6850Q41.3	5480	2/12/2018	2/2/2018	
10	1802229001	LH18/24-SP650_011018				SAMPLE	3	1802229001-A	E6850Q41.3	5480	2/7/2018	2/5/2018	
11	585120	CCV for HBN 207523 [ELMS/2040]				CCV	3		E685041C3Q	5311		2/2/2018	
12	585121	LODV for HBN 207523 [ELMS/2040]				LODV	3		E6850.D3Q	5311		2/2/2018	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #()'s: 1801949 (001-04); 1802229 (001)
 ELMS Batch/HBN ID: 2040 (207523)
 Prep Date: 01/29/2018 Analysis Date: 01/29/2018 Analyst: T. Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\JAN\29JAN18D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot DI735)/0.1% glacial acetic acid (JT-Baker Lot 04802).
 Eluent B1: 95% ACN (B&J Lot DI735)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 38780. Dilutions of Working Standard Solution ID 32373 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 11/28/2017, sequence 28NOV17P.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-DOD.M Fragmentor: 160 Output Gain: 3 Injection Volume: 25µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
4.0	0.65
5.0	0.25
14.5	0.25
15.0	0.65
17.5	0.65

QC DATA: 5.0µL of QC Solution Horizon ID 36749 was used for LCS 585119; Target = 5.0µg/L. ASTM type II water was used for LMB 585118.

MS/MSD: MS/MSD was performed on samples 1801949002/03 (Client ID: 17WW19-011518). 5.0µL of Working Standard Solution Horizon ID 36735 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for some of the Initial Calibration analyses (datafiles: 28NOVP01,02) along with datafiles 29JAND02/04/11/13/14.
- 5) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\ 207523-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 36735		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/10/2017		Expires: 05/10/2018	
MFG Lot: TNB: 05/10/17		Lab Lot: CLO4 WRK		Usable: Yes	
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36734	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	05/10/2018



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850 Stock AccStd 1,000ug/mL
Standard: 36733		Created By: T. Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 5/10/2017	Expires: 10/4/2018
MFG Lot: 216095148		Lab Lot: CLO4 STOCK	Usable: Yes
Part ID: IC-PER-10X-1			
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109		Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House		Create Date: 10/6/2005	Expires: 11/7/2025
MFG Lot:		Lab Lot: LAB 109	Usable: Yes
Part ID:			
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 36734		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/10/2017		Expires: 05/10/2018	
MFG Lot: TNB: 05/10/17		Lab Lot: CLO4 INT		Usable: Yes	
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36733	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	10/04/2018



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 36750		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/11/2017		Expires: 05/11/2018	
MFG Lot: TNB: 05/11/17		Lab Lot: CLO4 QC WRK 100.ug/L		Usable: Yes	
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36749	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/11/2018



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 36749		Created By: T. Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/11/2017	Expires: 05/11/2018		
MFG Lot: TNB: 05/11/2017		Lab Lot: CLO4 QC INT 10.ug/mL	Usable: Yes		
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109		Created By: ALS Support (Lims)	
MFG: DCL In House		Amount: 1000 L	
MFG Lot:		Create Date: 10/6/2005	
Part ID:		Expires: 11/7/2025	
		Usable: Yes	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748		Created By: T. Bosch	Amount: 100 mL
MFG: Ultra Scientific		Create Date: 5/11/2017	Expires: 3/31/2020
MFG Lot: CP-0860		Lab Lot: CLO4 QC STOCK	Usable: Yes
Part ID: ICC-013			
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 38780		Created By: Thomas Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 10/09/2017 01:10PM	Expires: 10/09/2018		
MFG Lot: TNB: 10/09/17		Verified By: Thomas Bosch	Usable: Yes		
Pipette ID: Not Provided		Verify Date:	Lab Lot: CLO4ISTDWRK		
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
23118	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.1 mL	02/27/2024



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 23118		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 04/04/2014 03:04PM	Expires: 02/27/2024
MFG Lot: SDDG-013		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date: 02/05/2009 12:02AM	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.





Certificate of Analysis



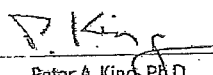
ISO Guide 34 Reference Material

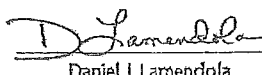
Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®, Inc.

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www.AccuStandard.com

CERTIFICATE OF ANALYSIS

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 216095148

Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Oct 4, 2016

Expiration: Oct 4, 2018

Sample Size: 100 mL

Components: 1

Storage Condition: Ambient ($>5^\circ\text{C}$)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO Guide 34 Scope of Accreditation: Yes



Signal Word: Warning

Component		SRM #	Prepared Concentration ($\mu\text{g/mL}$)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.2\%$. See reverse side for details.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a $0.2\ \mu\text{m}$ filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be $\pm 0.5\%$ of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:

ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$
 Labeled CAS Number: NA
 Unlabeled CAS Number: 7601-89-0
 MW*: 130.4
 Chemical Formula: NaClO_4
 Storage: Store at room temperature away from light and moisture.
 Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* For isotopically labeled compounds, MW listed is for the fully enriched product.

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 $\mu\text{g/mL}$
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 $\pm$ 2.8 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount
* 585116	LODV@1.	Vial 72	1	Control	2	3.99335e4	1.23322
* 585115	CCV@25	Vial 71	1	Control	3	8.69918e5	26.45203
* 585117	ICS@1.	Vial 73	1	Control	4	2.41610e4	9.70817e-1
* 585118	LMB	Vial 74	1	Control	5	0.00000	0.00000
* 585119	LCS@5.	Vial 75	1	Control	6	1.55581e5	5.20404
* 1801949001		Vial 76	1	Sample	7	0.00000	0.00000
* 1801949002	MS	Vial 77	1	Sample	8	1.40255e5	4.40206
* 1801949003	MSD	Vial 78	1	Sample	9	1.50985e5	4.37111
* 1801949004	FD	Vial 79	1	Sample	10	0.00000	0.00000
* 1802229001		Vial 80	1	Sample	11	6.37274e4	2.27213
* 585121	LODV@1.	Vial 72	1	Control	13	4.64507e4	1.29303
* 585120	CCV@25	Vial 71	1	Control	14	7.64537e5	21.47601

#*	Sample Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
* 585116	LODV@1.	Vial 72	1	Control	2	1.60003e4	1.30186
* 585115	CCV@25	Vial 71	1	Control	3	2.91664e5	27.98484
* 585117	ICS@1.	Vial 73	1	Control	4	7613.24951	7.23463e-1
* 585118	LMB	Vial 74	1	Control	5	0.00000	0.00000
* 585119	LCS@5.	Vial 75	1	Control	6	5.18019e4	5.18929
* 1801949001		Vial 76	1	Sample	7	0.00000	0.00000
* 1801949002	MS	Vial 77	1	Sample	8	4.80214e4	4.47697
* 1801949003	MSD	Vial 78	1	Sample	9	5.31868e4	4.57538
* 1801949004	FD	Vial 79	1	Sample	10	0.00000	0.00000
* 1802229001		Vial 80	1	Sample	11	2.56524e4	2.61089
* 585121	LODV@1.	Vial 72	1	Control	13	1.71864e4	1.25602
* 585120	CCV@25	Vial 71	1	Control	14	2.53308e5	22.34917

#*	Sample Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount
* 585116	LODV@1.	Vial 72	1	Control	2	1.52315e5	5.00000
* 585115	CCV@25	Vial 71	1	Control	3	1.33865e5	5.00000
* 585117	ICS@1.	Vial 73	1	Control	4	1.17867e5	5.00000
* 585118	LMB	Vial 74	1	Control	5	1.54956e5	5.00000
* 585119	LCS@5.	Vial 75	1	Control	6	1.35641e5	5.00000
* 1801949001		Vial 76	1	Sample	7	1.33078e5	5.00000
* 1801949002	MS	Vial 77	1	Sample	8	1.45286e5	5.00000
* 1801949003	MSD	Vial 78	1	Sample	9	1.57539e5	5.00000
* 1801949004	FD	Vial 79	1	Sample	10	1.37008e5	5.00000
* 1802229001		Vial 80	1	Sample	11	1.30009e5	5.00000
* 585121	LODV@1.	Vial 72	1	Control	13	1.68767e5	5.00000
* 585120	CCV@25	Vial 71	1	Control	14	1.48395e5	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

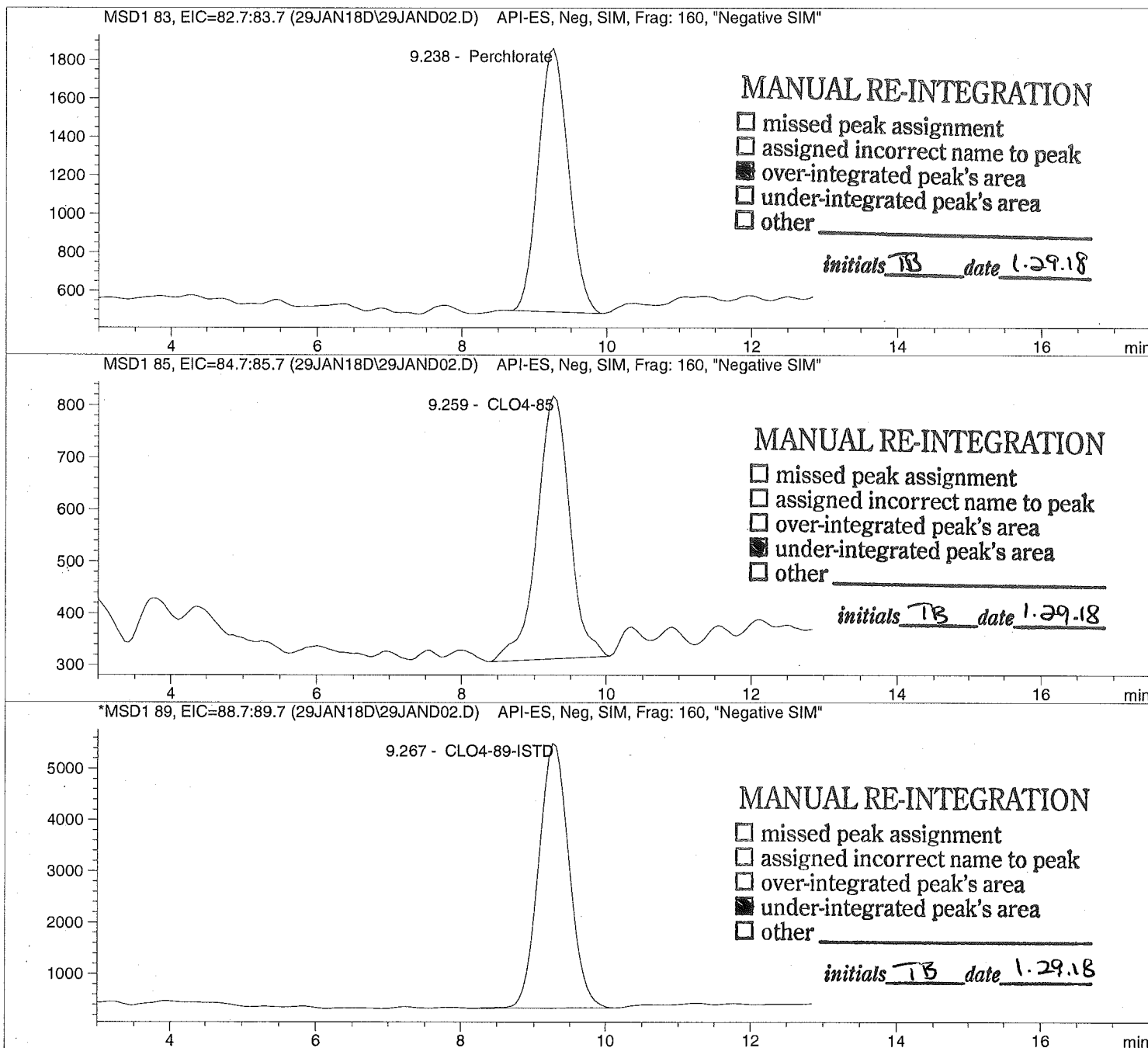
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	585115	CCV@25	CLO4-DOD 1	Ctrl Samp		
2	Vial 72	585116	LODV@1.	CLO4-DOD 1	Ctrl Samp		
3	Vial 71	585115	CCV@25	CLO4-DOD 1	Ctrl Samp		
4	Vial 73	585117	ICS@1.	CLO4-DOD 1	Ctrl Samp		
5	Vial 74	585118	LMB	CLO4-DOD 1	Ctrl Samp		
6	Vial 75	585119	LCS@5.	CLO4-DOD 1	Ctrl Samp		
7	Vial 76	1801949001		CLO4-DOD 1	Sample		
8	Vial 77	1801949002	MS	CLO4-DOD 1	Sample		
9	Vial 78	1801949003	MSD	CLO4-DOD 1	Sample		
10	Vial 79	1801949004	FD	CLO4-DOD 1	Sample		
11	Vial 80	1802229001		CLO4-DOD 1	Sample		
12	Vial 71	585120	CCV@25	CLO4-DOD 1	Ctrl Samp		
13	Vial 72	585121	LODV@1.	CLO4-DOD 1	Ctrl Samp		
14	Vial 71	585120	CCV@25	CLO4-DOD 1	Ctrl Samp		

Injection Date: 1/29/2018 08:53:03
Sample Name: 585116 LODV@1.
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date: 1/29/2018 08:53:03      Seq Line:      2
Sample Name:    585116  LODV@1.         Location:      Vial 72
Acq Operator:   TNB                    Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018 12:46:10
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   1.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.238	MM	39933.5	1.2332	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.259	MM	16000.3	1.3019	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.267	MM	152314.7	5.0000	CLO4-89-ISTD

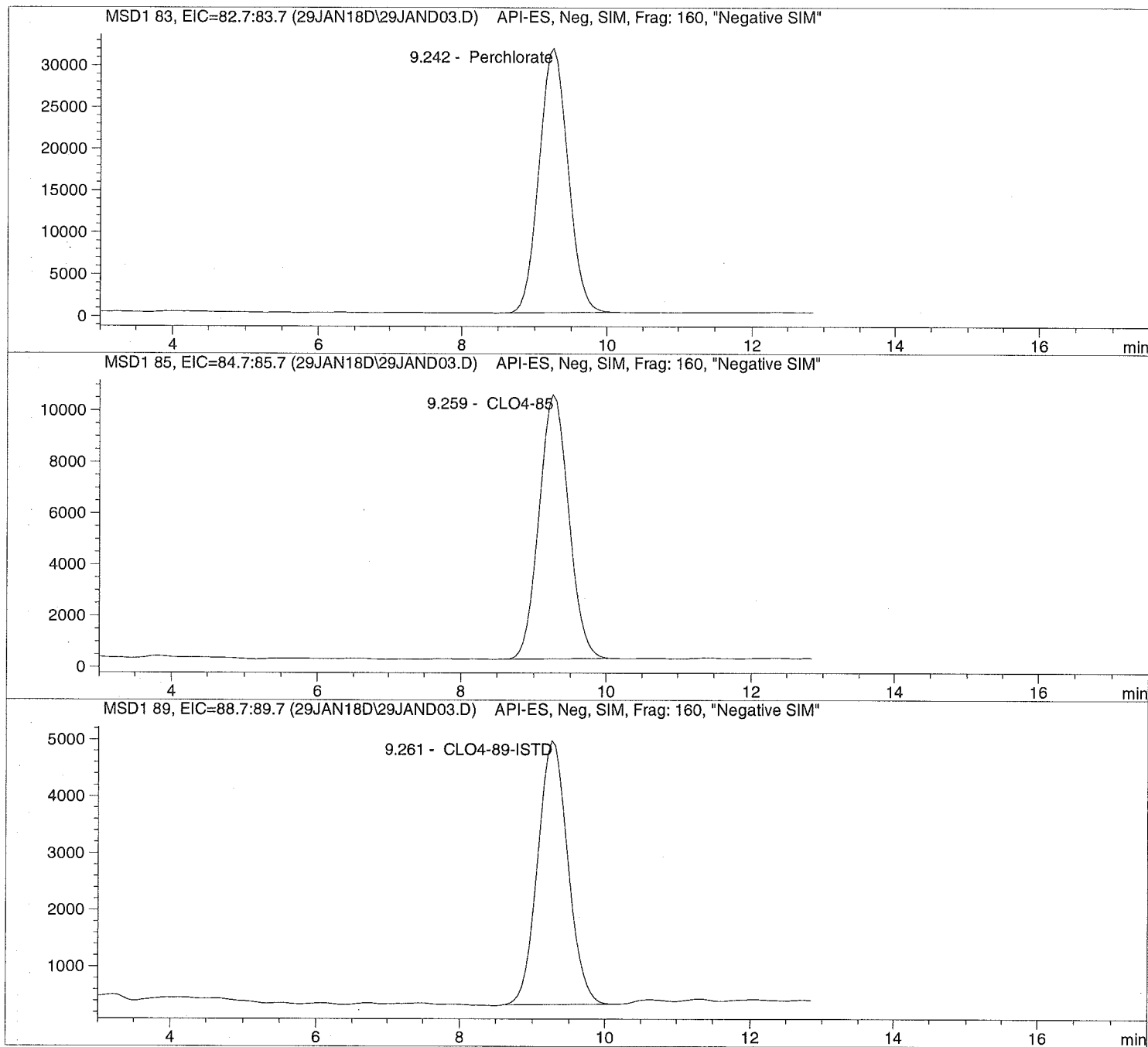
```
=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 09:12:03
Sample Name: 585115 CCV@25
Acq Operator: TNB

Seq Line: 3
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  09:12:03      Seq Line:           3
Sample Name:    585115   CCV@25          Location:           Vial 71
Acq Operator:   TNB                               Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.242	PBA	869917.6	26.4520	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.259	PBA	291664.1	27.9848	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.261	PBA	133864.6	5.0000	CLO4-89-ISTD

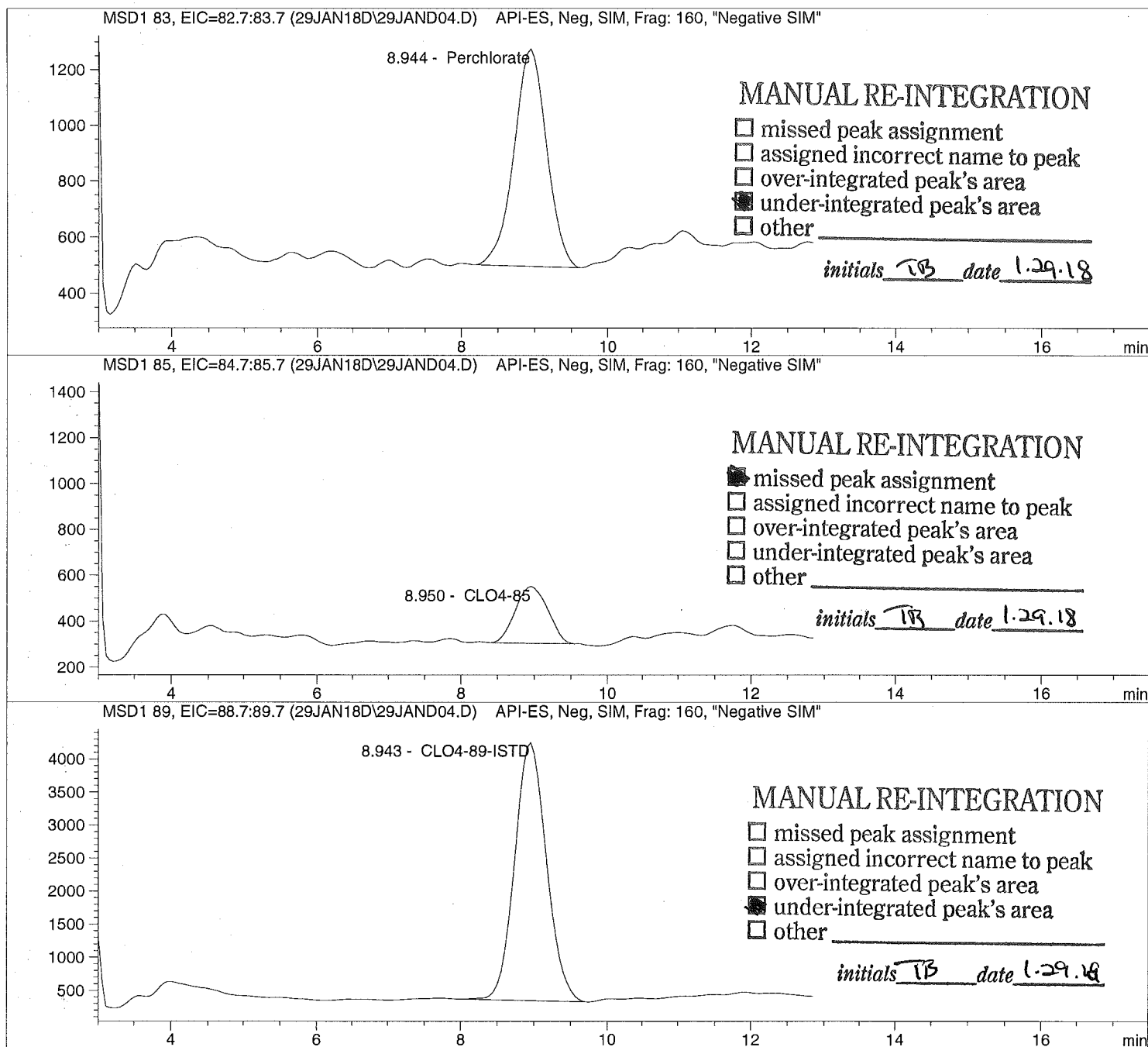
```
=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 09:28:16
Sample Name: 585117 ICS@1.
Acq Operator: TNB

Seq Line: 4
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



Injection Date: 1/29/2018 09:28:16 Seq Line: 4
Sample Name: 585117 ICS@1. Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.944	MM	24161.0	0.9708	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.950	MM	7613.2	0.7235	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.943	MM	117867.3	5.0000	CLO4-89-ISTD

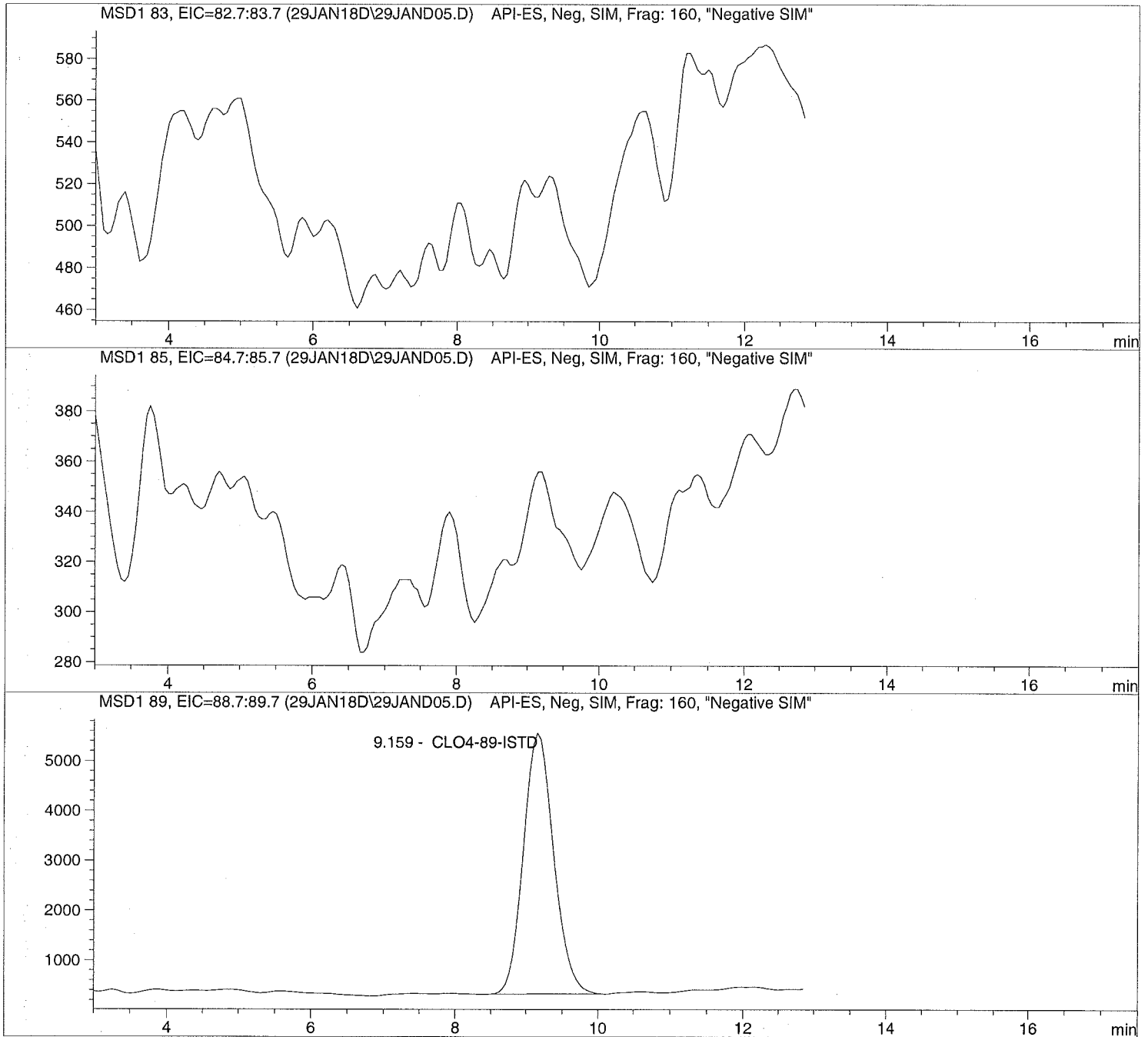
*** End of Report ***

Injection Date: 1/29/2018 09:43:00
Sample Name: 585118 LMB
Acq Operator: TNB

Seq Line: 5
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  09:43:00      Seq Line:           5
Sample Name:    585118    LMB             Location:           Vial 74
Acq Operator:   TNB                Inj. No.:            1
                                           Inj. Vol.:           25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified:  Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.159	PBA	154955.5	5.0000	CLO4-89-ISTD

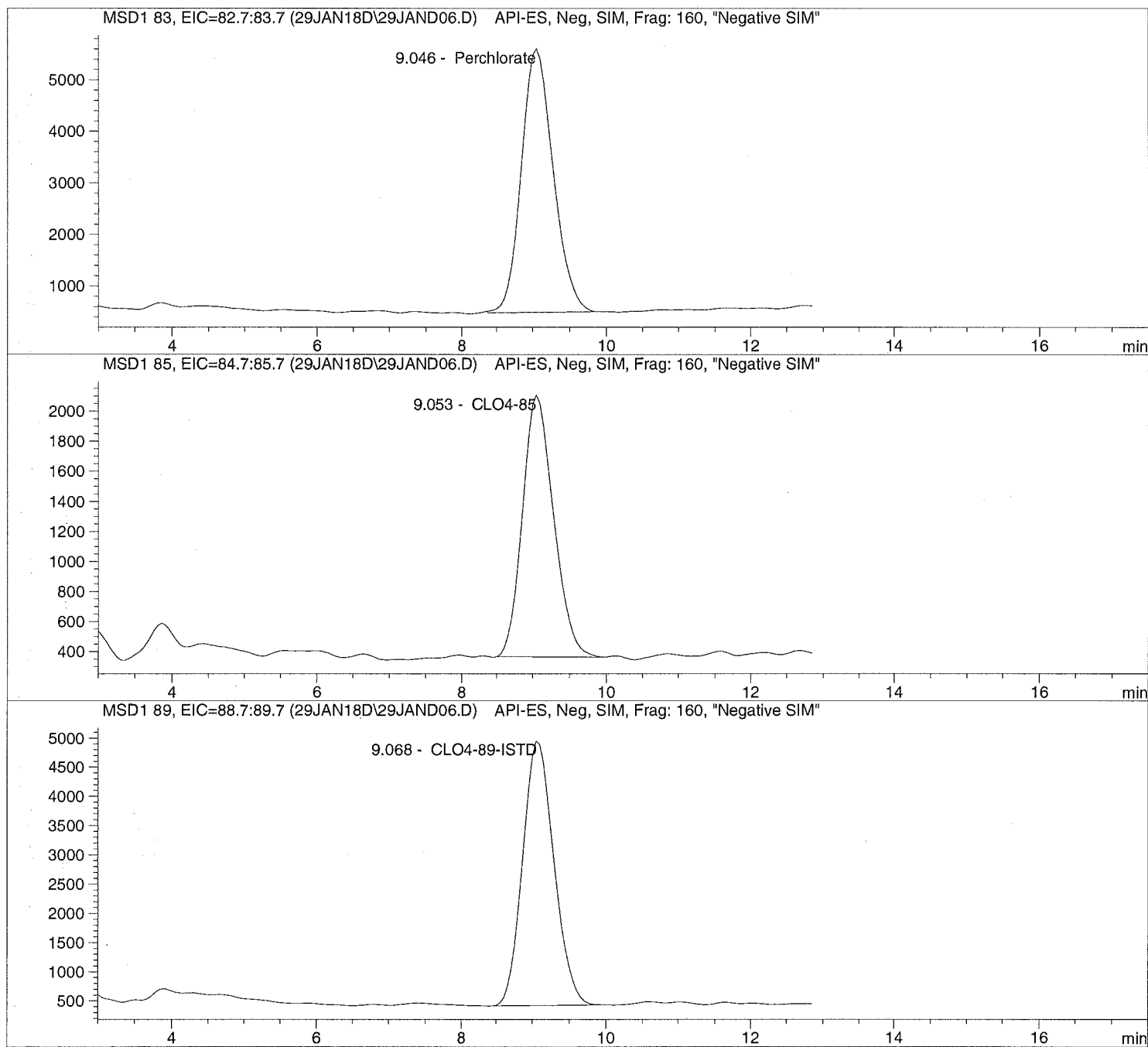
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*** End of Report ***
=====
```

Injection Date: 1/29/2018 09:57:39
Sample Name: 585119 LCS05.
Acq Operator: TNB

Seq Line: 6
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date: 1/29/2018 09:57:39      Seq Line: 6
Sample Name: 585119 LCS@5.             Location: Vial 75
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.046	BBA	155580.6	5.2040	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.053	PBA	51801.9	5.1893	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.068	PBA	135640.7	5.0000	CLO4-89-ISTD

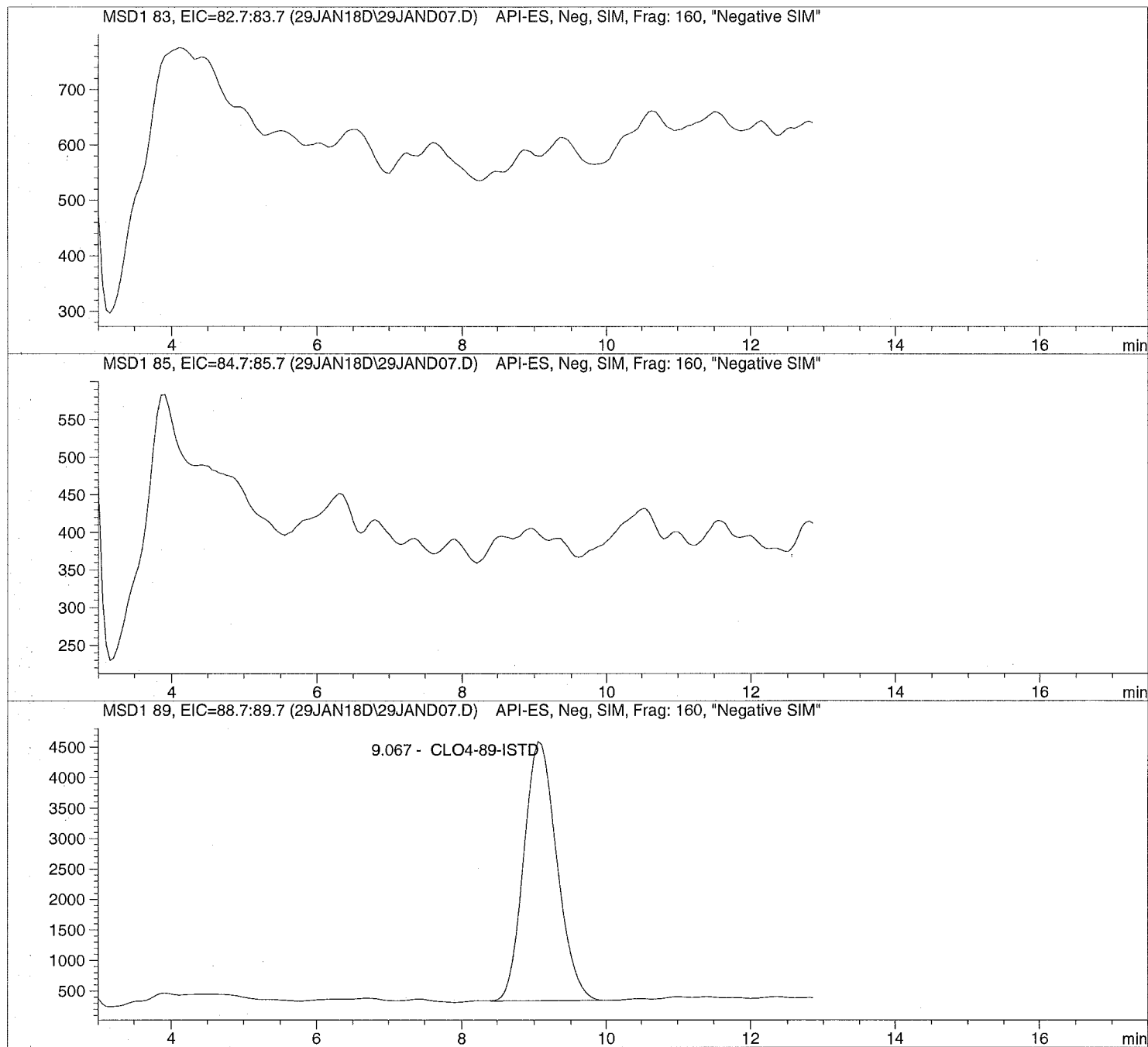
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=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 10:13:23
Sample Name: 1801949001
Acq Operator: TNB

Seq Line: 7
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  10:13:23      Seq Line:           7
Sample Name:    1801949001      Location:          Vial 76
Acq Operator:   TNB             Inj. No.:          1
                                   Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.067	BBA	133077.6	5.0000	CLO4-89-ISTD

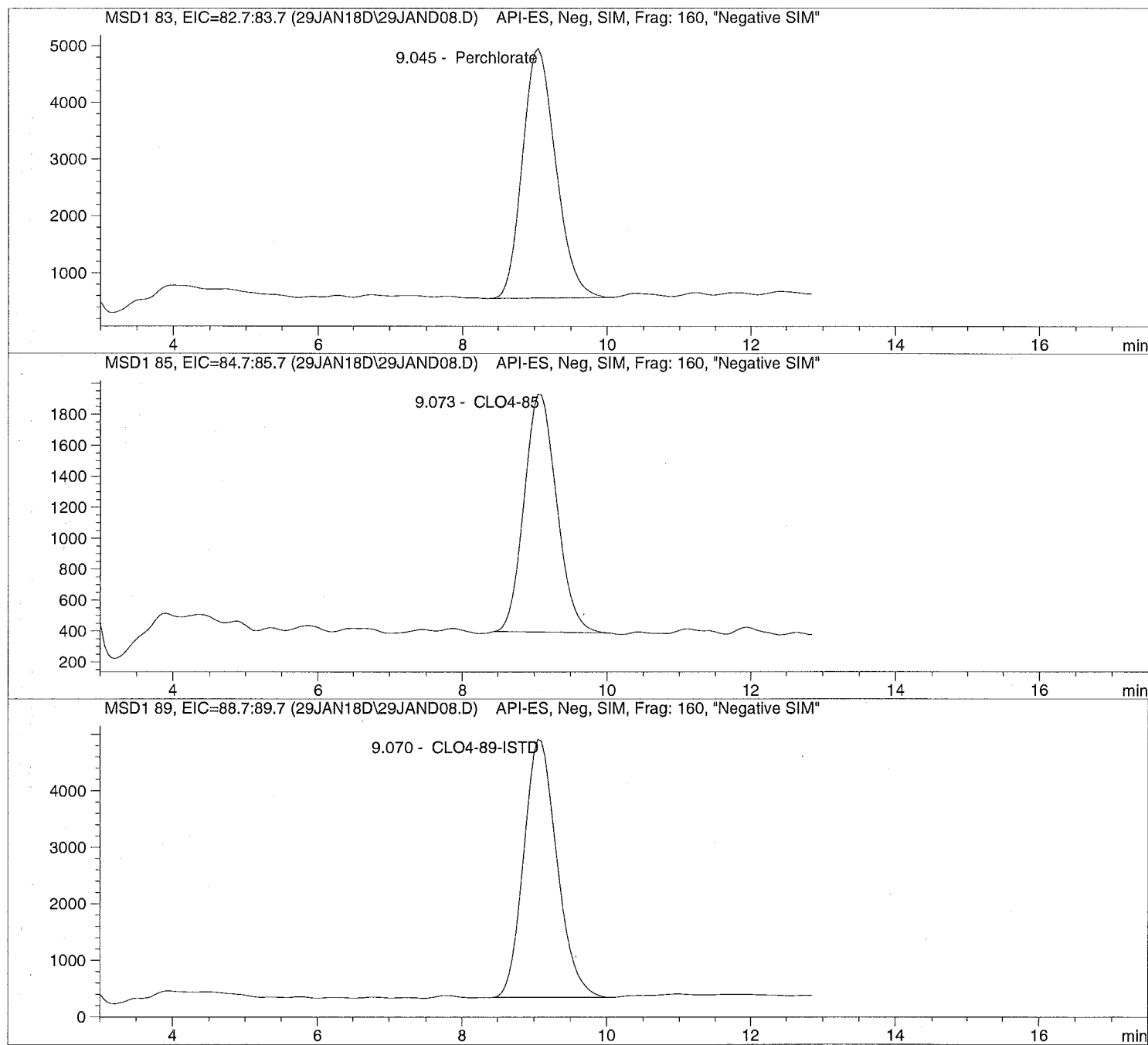
```
=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 10:28:03
Sample Name: 1801949002 MS
Acq Operator: TNB

Seq Line: 8
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  10:28:03      Seq Line:           8
Sample Name:    1801949002   MS          Location:          Vial 77
Acq Operator:   TNB                Inj. No.:             1
                                           Inj. Vol.:            25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.045	PBA	140255.5	4.4021	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.073	BBA	48021.4	4.4770	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.070	PBA	145286.1	5.0000	CLO4-89-ISTD

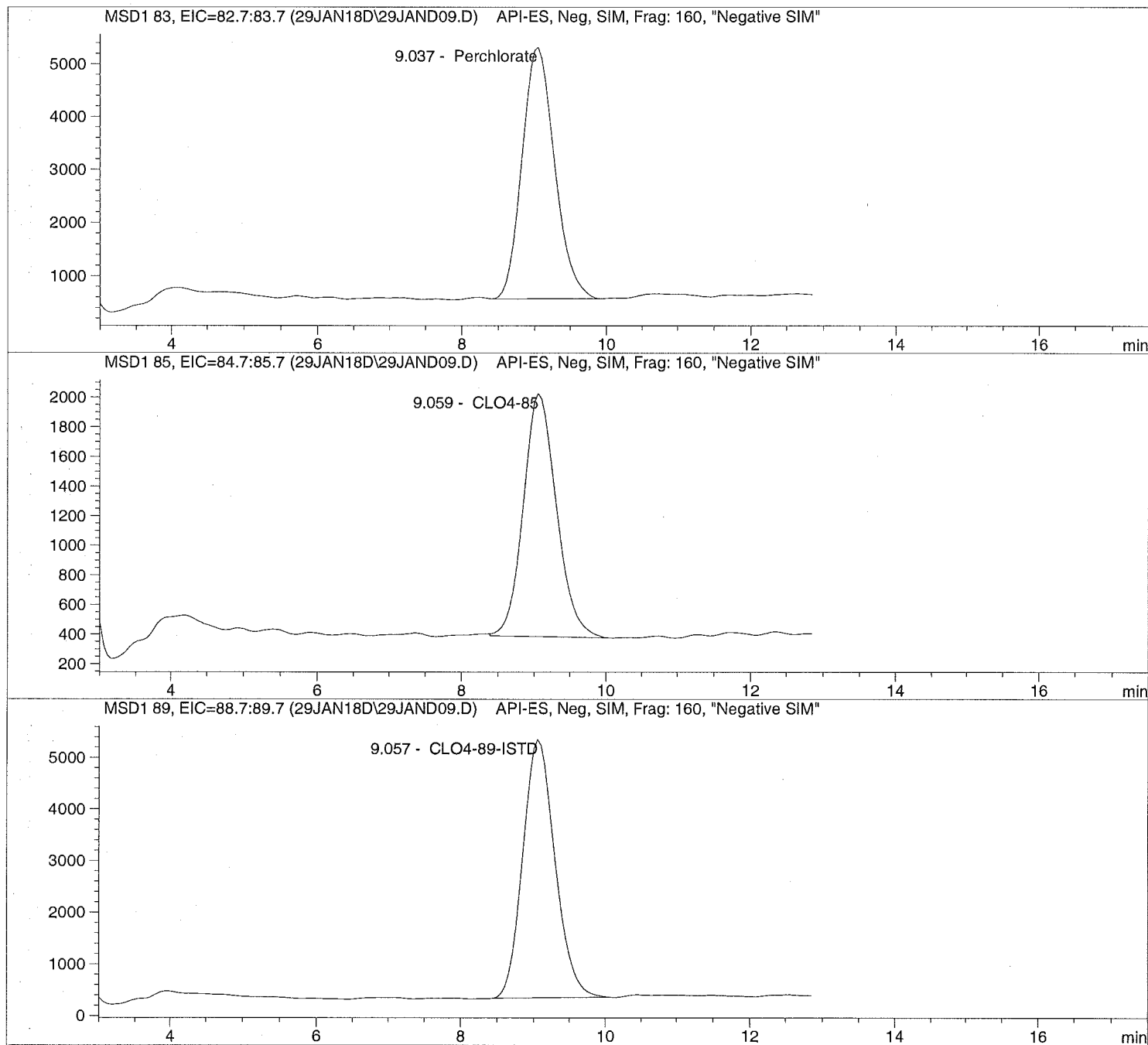
```
=====
*** End of Report ***
=====
```


Injection Date: 1/29/2018 10:42:43
Sample Name: 1801949003 MSD
Acq Operator: TNB

Seq Line: 9
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  10:42:43      Seq Line:          9
Sample Name:    1801949003   MSD          Location:         Vial 78
Acq Operator:   TNB          Inj. No.:          1
                                   Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.037	PBA	150984.7	4.3711	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.059	BBA	53186.8	4.5754	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.057	PBA	157539.1	5.0000	CLO4-89-ISTD

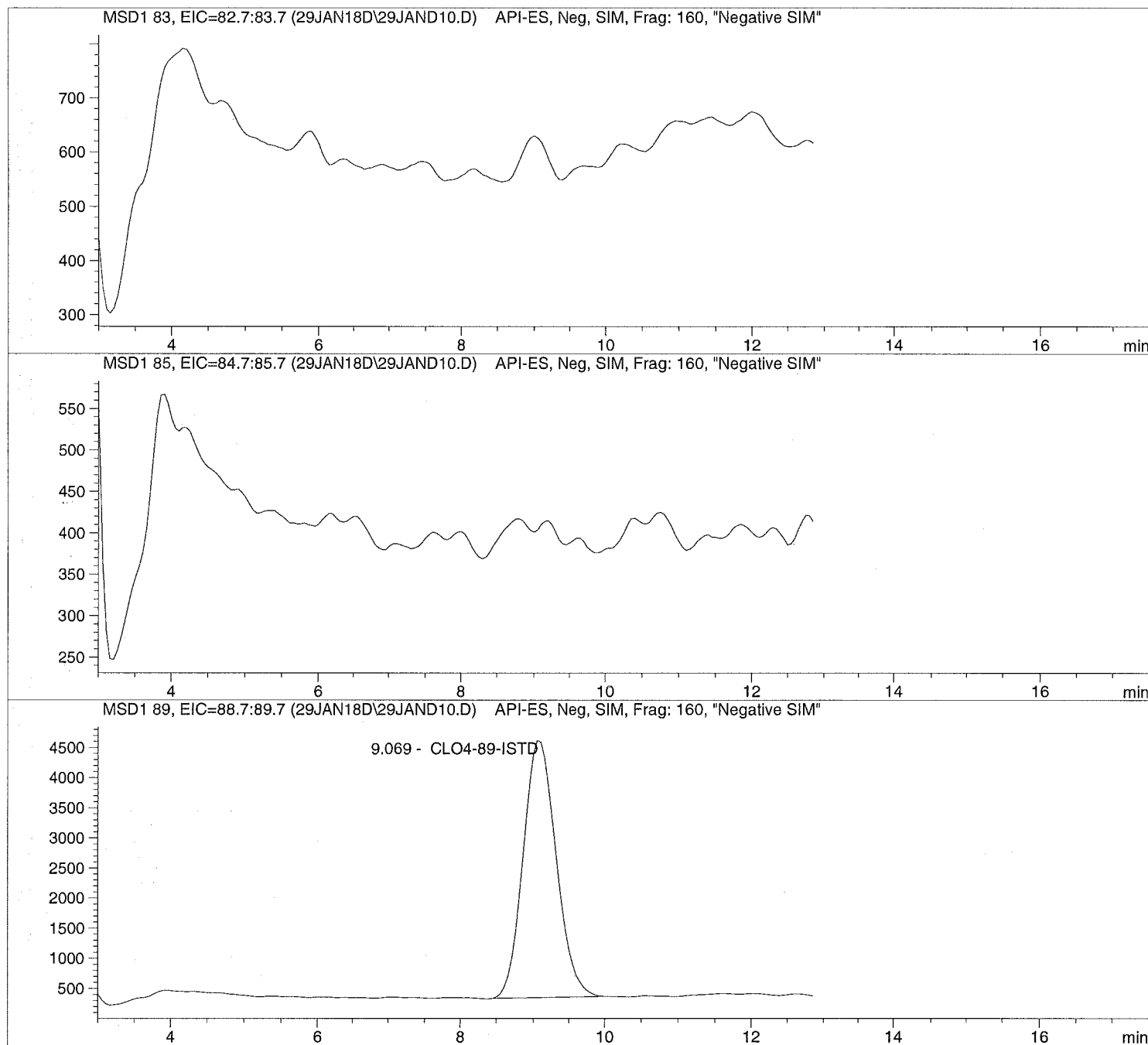
```
=====
*** End of Report ***
=====
```

=====

Injection Date:	1/29/2018 10:57:23	Seq Line:	10
Sample Name:	1801949004 FD	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  10:57:23      Seq Line:          10
Sample Name:    1801949004   FD           Location:          Vial 79
Acq Operator:   TNB                Inj. No.:            1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.069	PBA	137008.2	5.0000	CLO4-89-ISTD

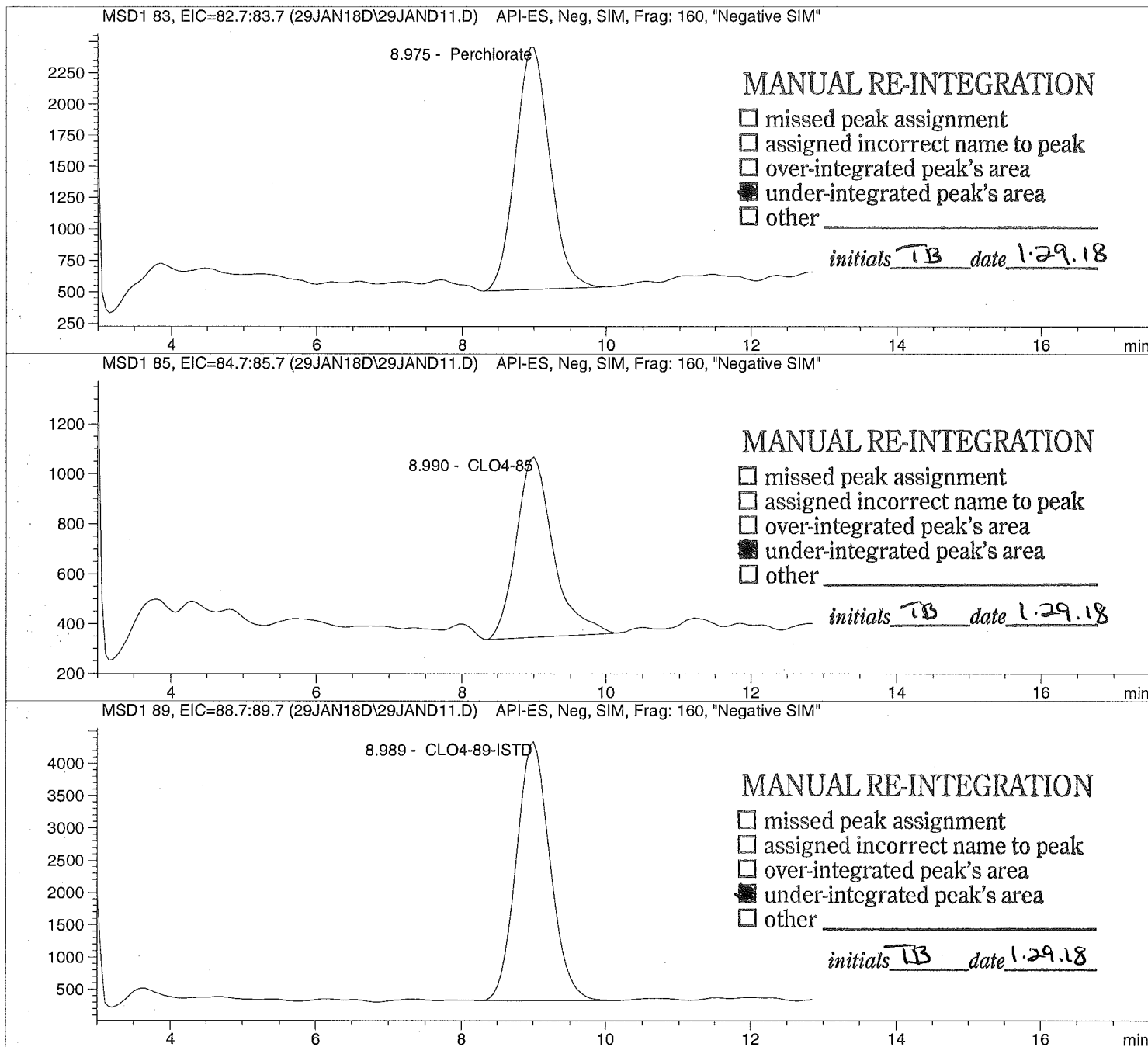
```
=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 11:12:05
Sample Name: 1802229001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  11:12:05      Seq Line:      11
Sample Name:    1802229001      Location:      Vial 80
Acq Operator:   TNB             Inj. No.:      1
                                   Inj. Vol.:      25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.975	MM	63727.4	2.2721	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.990	MM	25652.4	2.6109	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.989	MM	130009.1	5.0000	CLO4-89-ISTD

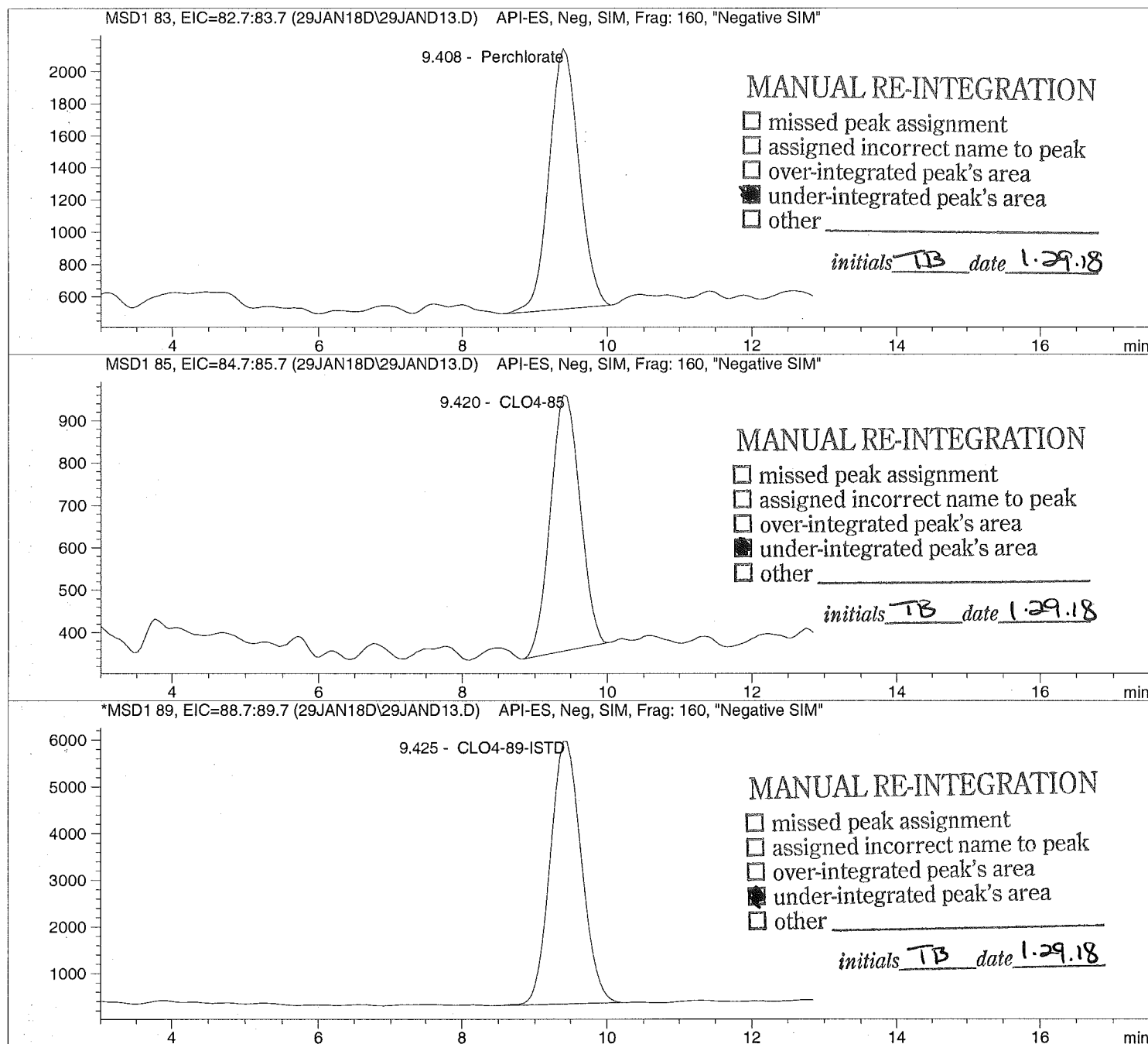
```
=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 11:41:26
Sample Name: 585121 LODV@1.
Acq Operator: TNB

Seq Line: 13
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```

=====
Injection Date: 1/29/2018 11:41:26      Seq Line: 13
Sample Name: 585121    LODV@1.      Location: Vial 72
Acq Operator: TNB      Inj. No.: 1
                                 Inj. Vol.: 25 µl
=====
    
```

```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10
    
```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
    
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.408	MM	46450.7	1.2930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.420	MM	17186.4	1.2560	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.425	MM	168767.0	5.0000	CLO4-89-ISTD

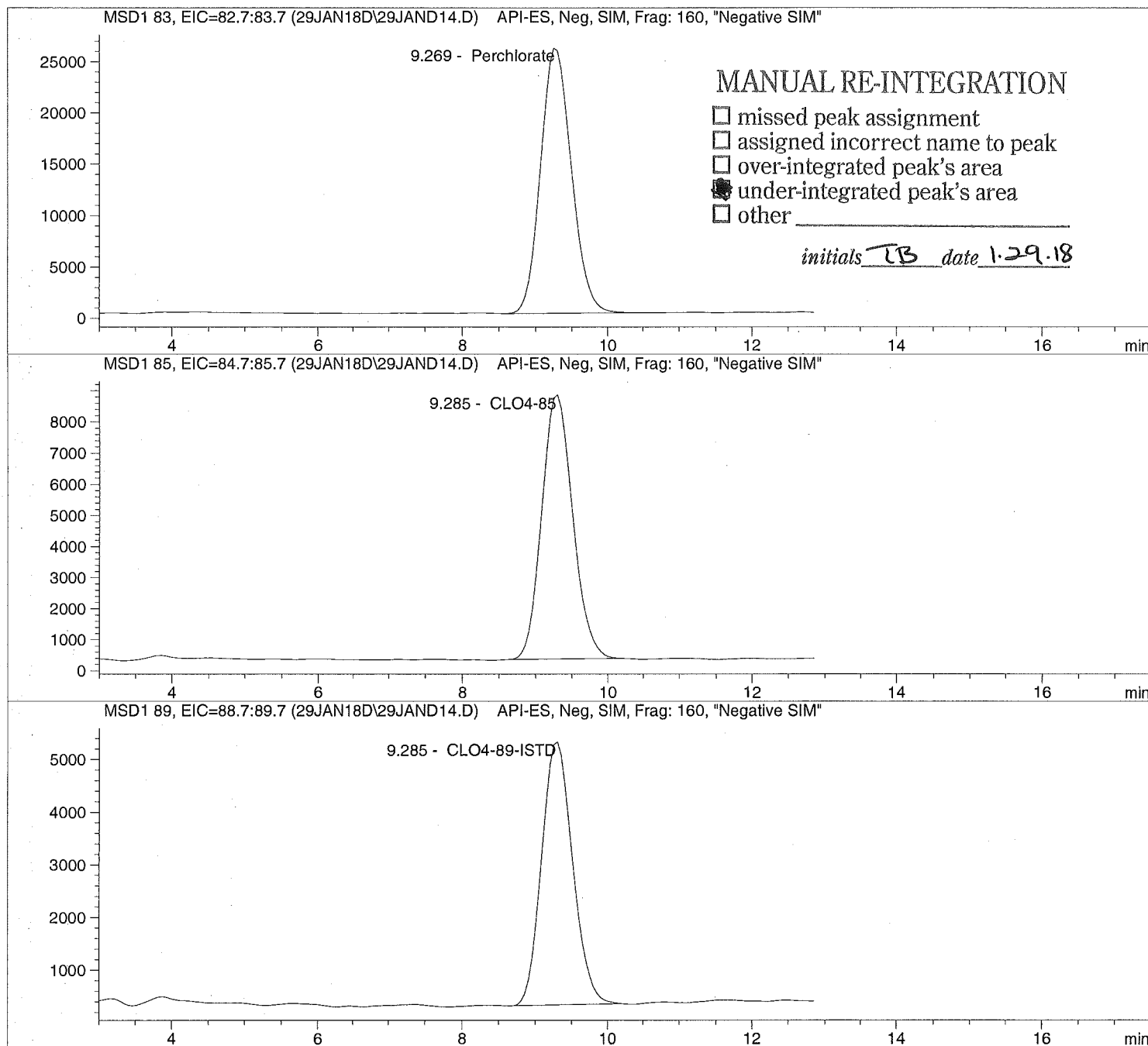
*** End of Report ***

Injection Date: 1/29/2018 11:58:26
Sample Name: 585120 CCV@25
Acq Operator: TNB

Seq Line: 14
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  11:58:26      Seq Line:      14
Sample Name:    585120    CCV@25          Location:      Vial 71
Acq Operator:   TNB                      Inj. No.:      1
                                           Inj. Vol.:    25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.269	MM	764537.1	21.4760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.285	PBA	253307.9	22.3492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.285	PBA	148394.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

 Calibration Table

Perchlorate

Calib. Data Modified : 11/29/2017 8:02:06 AM

Calculate : Internal Standard

Based on : Peak Area

Rel. Reference Window : 20.000 %

Abs. Reference Window : 0.000 min

Rel. Non-ref. Window : 20.000 %

Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs

Uncalibrated Peaks : not reported

Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)

Origin : Ignored (some peaks differ, see below)

Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:

Average Response : Average all calibrations

Average Retention Time: Floating Average New 75%

Calibration Report Options :

Printout of recalibrations within a sequence:

Calibration Table after Recalibration

Normal Report after Recalibration

If the sequence is done with bracketing:

Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name

#

#	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7

Signal 2: MSD1 85, EIC=84.7:85.7

Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
12.090	1 1	1.00000	4.10942e4	2.43343e-5	1 Perchlorate
	2	2.00000	7.74077e4	2.58372e-5	
	3	5.00000	1.92985e5	2.59088e-5	
	4	10.00000	3.91583e5	2.55374e-5	
	5	25.00000	1.09763e6	2.27764e-5	
	6	50.00000	2.29834e6	2.17549e-5	
	7	75.00000	3.73021e6	2.01061e-5	
12.106	2 1	1.00000	1.56787e4	6.37808e-5	1 CLO4-85
	2	2.00000	2.80487e4	7.13046e-5	
	3	5.00000	6.51323e4	7.67668e-5	
	4	10.00000	1.31325e5	7.61471e-5	
	5	25.00000	3.46913e5	7.20642e-5	
	6	50.00000	6.96156e5	7.18230e-5	
	7	75.00000	1.13077e6	6.63264e-5	
12.107	3 1	5.00000	1.88880e5	2.64718e-5	+I1 CLO4-89-ISTD
	2	5.00000	1.81109e5	2.76076e-5	
	3	5.00000	1.75128e5	2.85505e-5	
	4	5.00000	1.80962e5	2.76301e-5	
	5	5.00000	1.75597e5	2.84743e-5	
	6	5.00000	1.69148e5	2.95599e-5	
	7	5.00000	1.64867e5	3.03275e-5	

ethod C:\HPCHEM\1\METHODS\CLO4-DPR.M

More compound-specific settings:

Compound: Perchlorate

Time Window : From 8.390 min To 13.052 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 8.366 min To 13.046 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

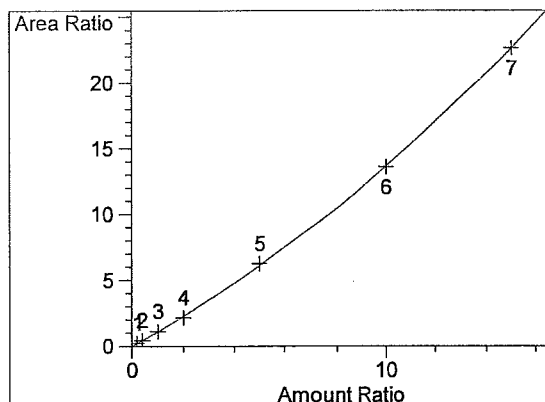
Compound: CLO4-89-ISTD

Time Window : From 8.457 min To 13.107 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Peak Sum Table

No Entries in table

Calibration Curves



Perchlorate at exp. RT: 12.090
 MSD1 83, EIC=82.7:83.7

Correlation: 0.99991

Residual Std. Dev.: 0.08487

Formula: $y = ax^2 + bx + c$

a: 2.87739e-2

b: 1.07712

c: -5.23718e-3

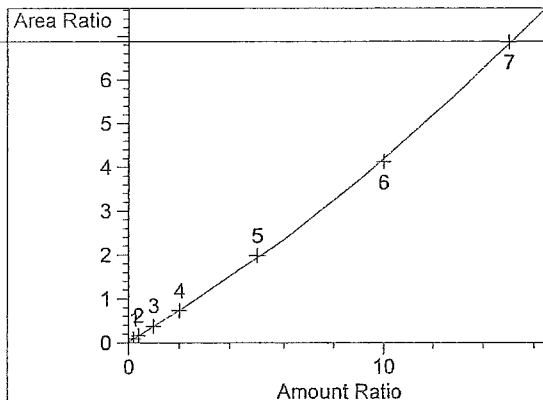
x: Amount Ratio

y: Area Ratio

Calibration Level Weights:

Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Method C:\HPCHEM\1\METHODS\CLO4-DPR.M



CLO4-85 at exp. RT: 12.106

MSD1 85, EIC=84.7:85.7

Correlation: 0.99988

Residual Std. Dev.: 0.04548

Formula: $y = ax^2 + bx + c$

a: 7.12800e-3

b: 3.46840e-1

c: 1.42573e-2

x: Amount Ratio

y: Area Ratio

Calibration Level Weights:

Level 1 : 1

Level 2 : 0.5

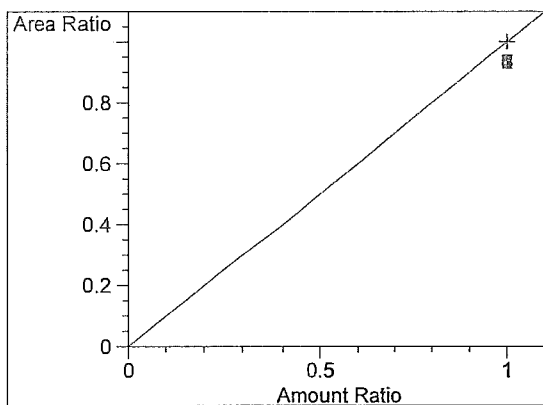
Level 3 : 0.2

Level 4 : 0.1

Level 5 : 0.04

Level 6 : 0.02

Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 12.107

MSD1 89, EIC=88.7:89.7

Correlation: 1.00000

Residual Std. Dev.: 0.00000

Formula: $y = mx + b$

m: 1.00000

b: 0.00000

x: Amount Ratio

y: Area Ratio

Calibration Level Weights:

Level 1 : 1

Level 2 : 1

Level 3 : 1

Level 4 : 1

Level 5 : 1

Level 6 : 1

Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\28NOV17P\28NOV17P.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.M

['#'] ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#*	Sample Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount	
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	4.10942e4	12.029	1.02861
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	7.74077e4	12.054	1.98725
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	1.92985e5	12.090	5.00575
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	3.91583e5	12.084	9.57892
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	1.09763e6	12.065	25.55231
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	2.29834e6	12.065	49.83164
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	3.73021e6	12.090	74.99992
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	3.83615e5	12.163	9.59533

#*	Sample Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	1.56787e4	12.053	9.87106e-1
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	2.80487e4	12.066	2.01046
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	6.51323e4	12.106	5.05104
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	1.31325e5	12.101	9.85678
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	3.46913e5	12.084	25.58435
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	6.96156e5	12.080	49.18282
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	1.13077e6	12.106	75.33907
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	1.31460e5	12.177	10.08554

#*	Sample Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	1.88880e5	12.050	5.00000
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	1.81109e5	12.078	5.00000
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	1.75128e5	12.110	5.00000
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	1.80962e5	12.109	5.00000
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	1.75597e5	12.084	5.00000
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	1.69148e5	12.086	5.00000
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	1.64867e5	12.107	5.00000
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	1.76961e5	12.181	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	ICAL1@ 1.0ug/L	CLO4-DOD	1	Ctrl Samp		
2	Vial 72	ICAL2@ 2.0ug/L	CLO4-DOD	1	Ctrl Samp		
3	Vial 73	ICAL3@ 5.0ug/L	CLO4-DOD	1	Ctrl Samp		
4	Vial 74	ICAL4@ 10.ug/L	CLO4-DOD	1	Ctrl Samp		
5	Vial 75	ICAL5@ 25.ug/L	CLO4-DOD	1	Ctrl Samp		
6	Vial 76	ICAL6@ 50.ug/L	CLO4-DOD	1	Ctrl Samp		
7	Vial 77	ICAL7@ 75.ug/L	CLO4-DOD	1	Ctrl Samp		
8	Vial 78	ICAL Verf@10ug/L	CLO4-DOD	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

Injection Date: 11/28/2017 09:08:10

Seq Line: 1

Sample Name: ICAL1@ 1.0ug/L

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

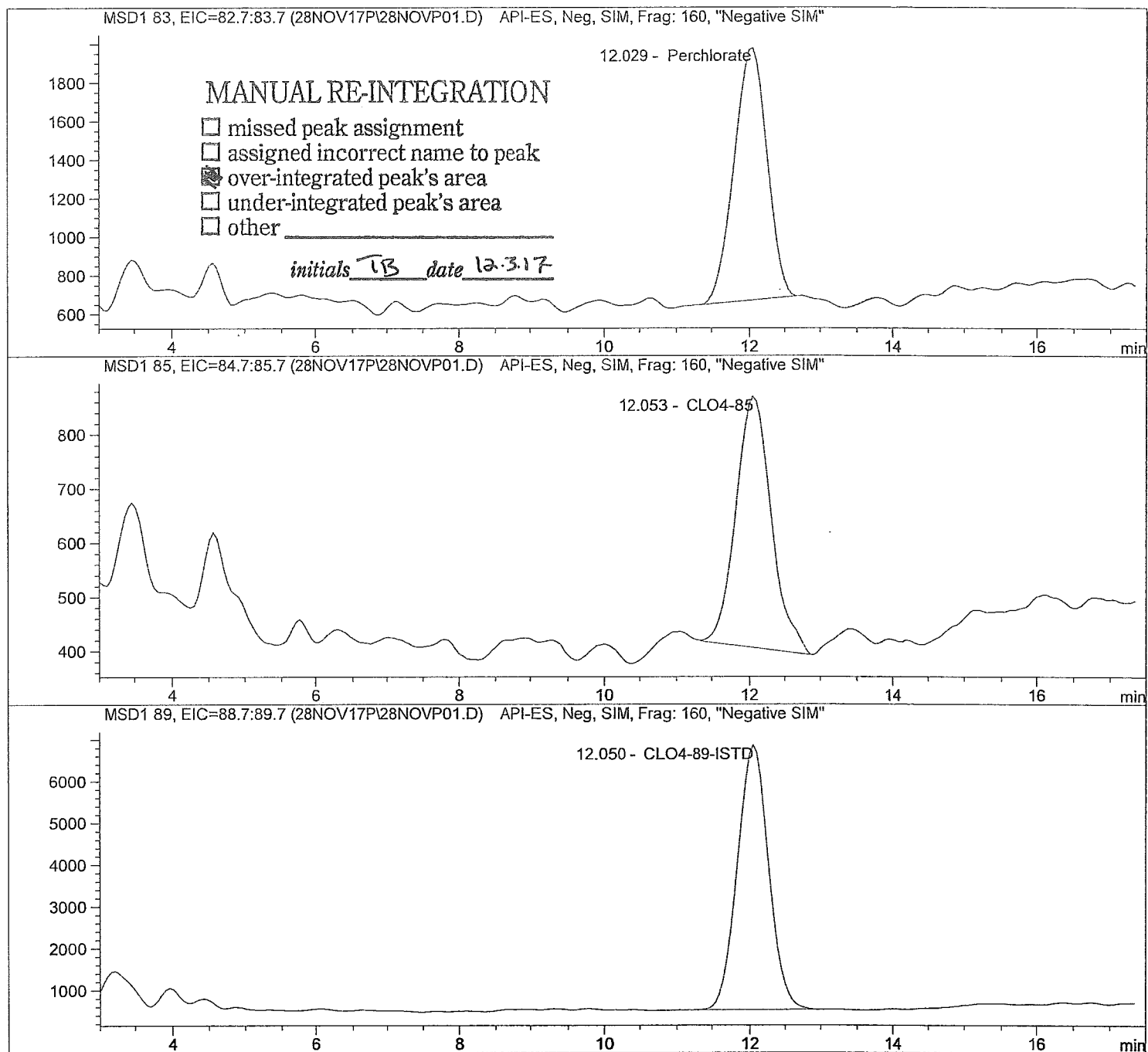
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

```
=====
Injection Date: 11/28/2017 09:08:10      Seq Line: 1
Sample Name: ICAL1@ 1.0ug/L              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.029	MM	41094.2	1.0286	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.053	BBA	15678.7	0.9871	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.050	BBA	188880.3	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP02.D

Sample Name: ICAL2@ 2.0ug/L

Injection Date: 11/28/2017 09:33:49

Seq Line: 2

Sample Name: ICAL2@ 2.0ug/L

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

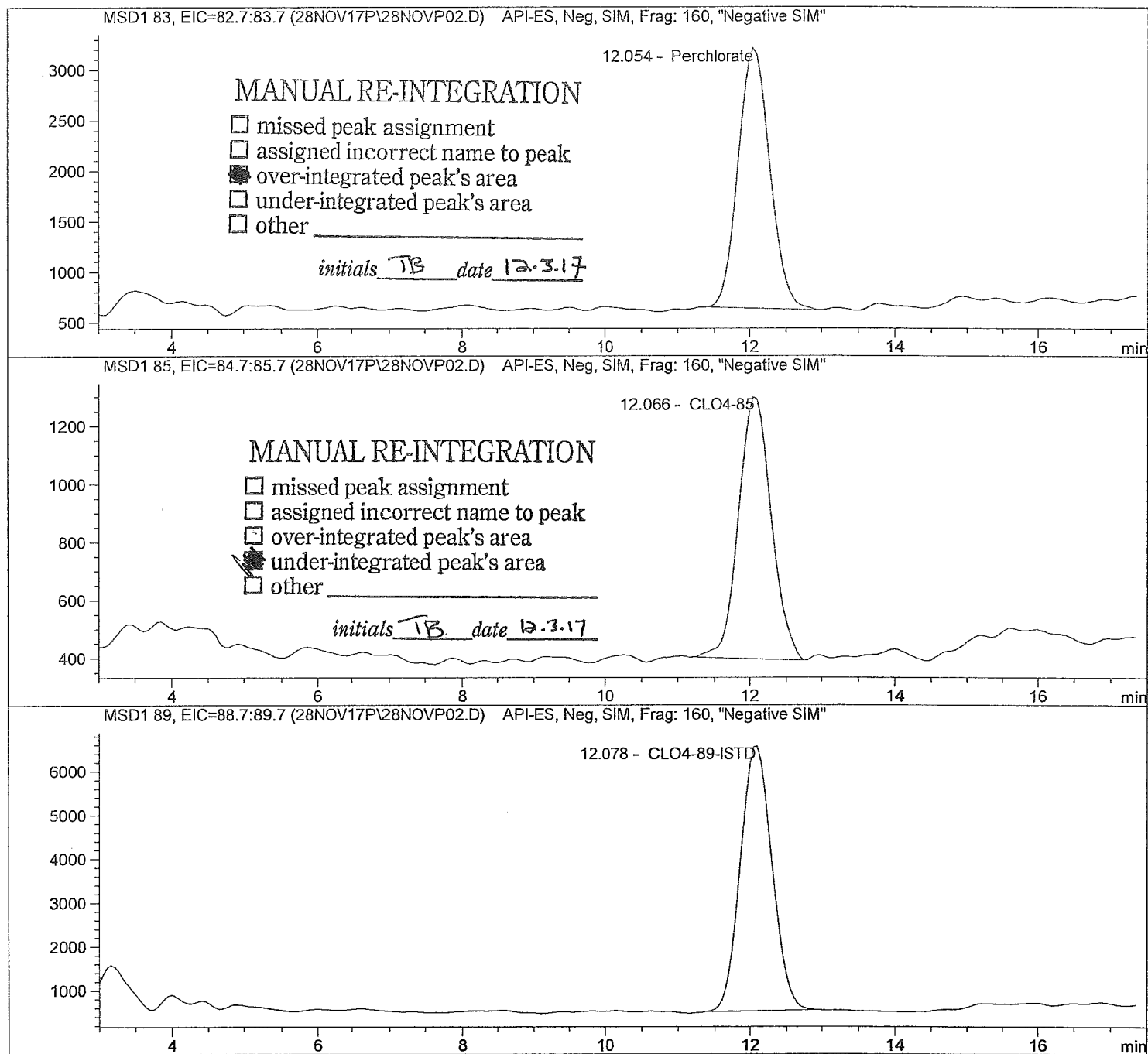
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP02.D

Sample Name: ICAL2@ 2.0ug/L

```
=====
Injection Date: 11/28/2017 09:33:49      Seq Line: 2
Sample Name:    ICAL2@ 2.0ug/L          Location: Vial 72
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   12/3/2017 11:06:36
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   2.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.054	MM	77407.7	1.9872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.066	MM	28048.7	2.0105	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.078	PBA	181109.4	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

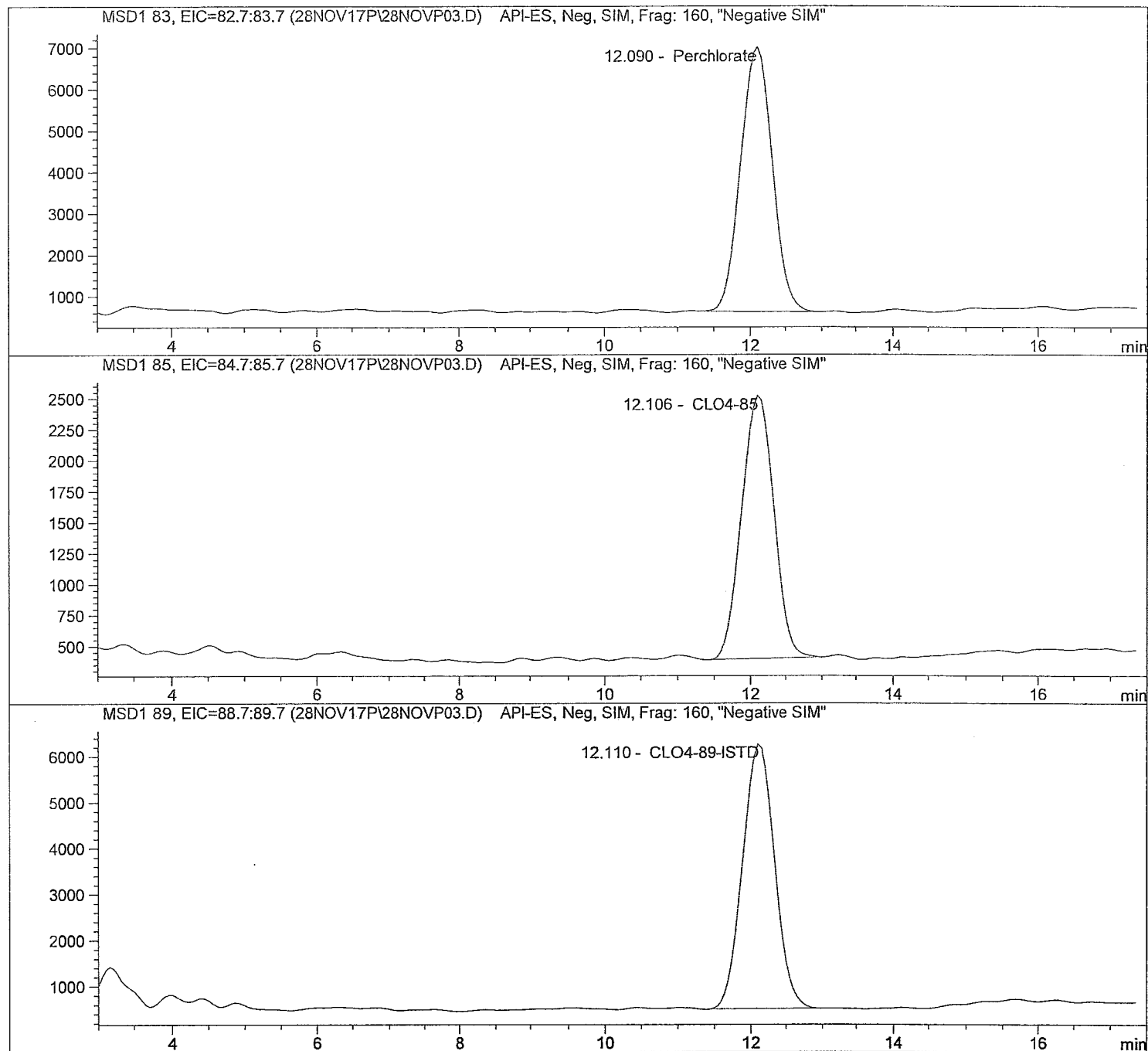
Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP03.D

Sample Name: ICAL3@ 5.0ug/L

Injection Date:	11/28/2017 09:53:00	Seq Line:	3
Sample Name:	ICAL3@ 5.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP03.D

Sample Name: ICAL3@ 5.0ug/L

```
=====
Injection Date: 11/28/2017 09:53:00      Seq Line: 3
Sample Name: ICAL3@ 5.0ug/L              Location: Vial 73
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.090	BBA	192984.6	5.0058	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.106	PBA	65132.3	5.0510	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.110	PBA	175128.5	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP04.D

Sample Name: ICAL4@ 10.ug/L

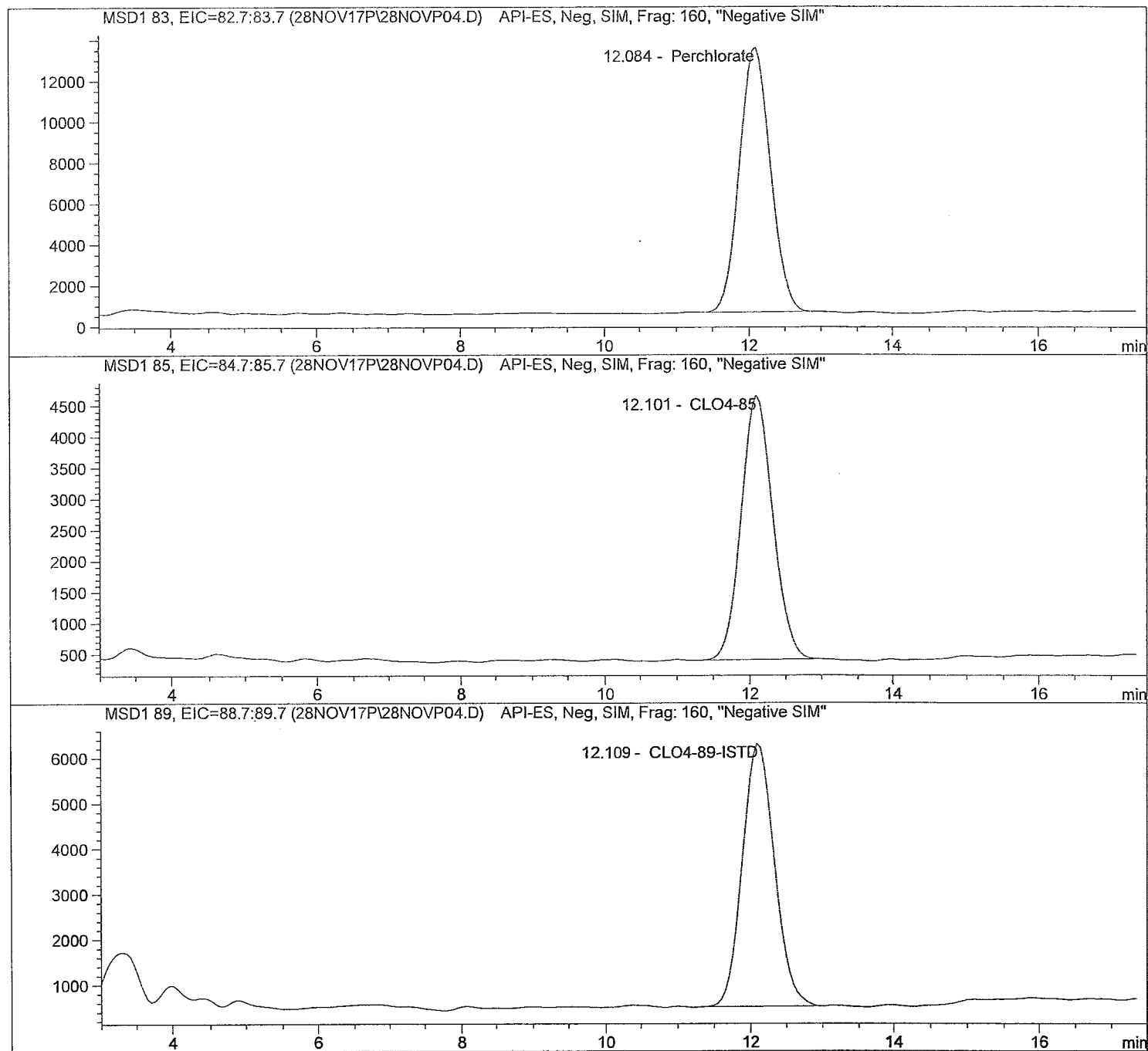
Injection Date:	11/28/2017 10:12:13	Seq Line:	4
Sample Name:	ICAL4@ 10.ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP04.D

Sample Name: ICAL4@ 10.ug/L

Injection Date:	11/28/2017 10:12:13	Seq Line:	4
Sample Name:	ICAL4@ 10.ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017, 08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.084	BBA	391582.9	9.5789	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.101	PBA	131324.7	9.8568	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.109	PBA	180962.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP05.D

Sample Name: ICAL5@ 25.ug/L

Injection Date: 11/28/2017 10:31:23

Seq Line: 5

Sample Name: ICAL5@ 25.ug/L

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

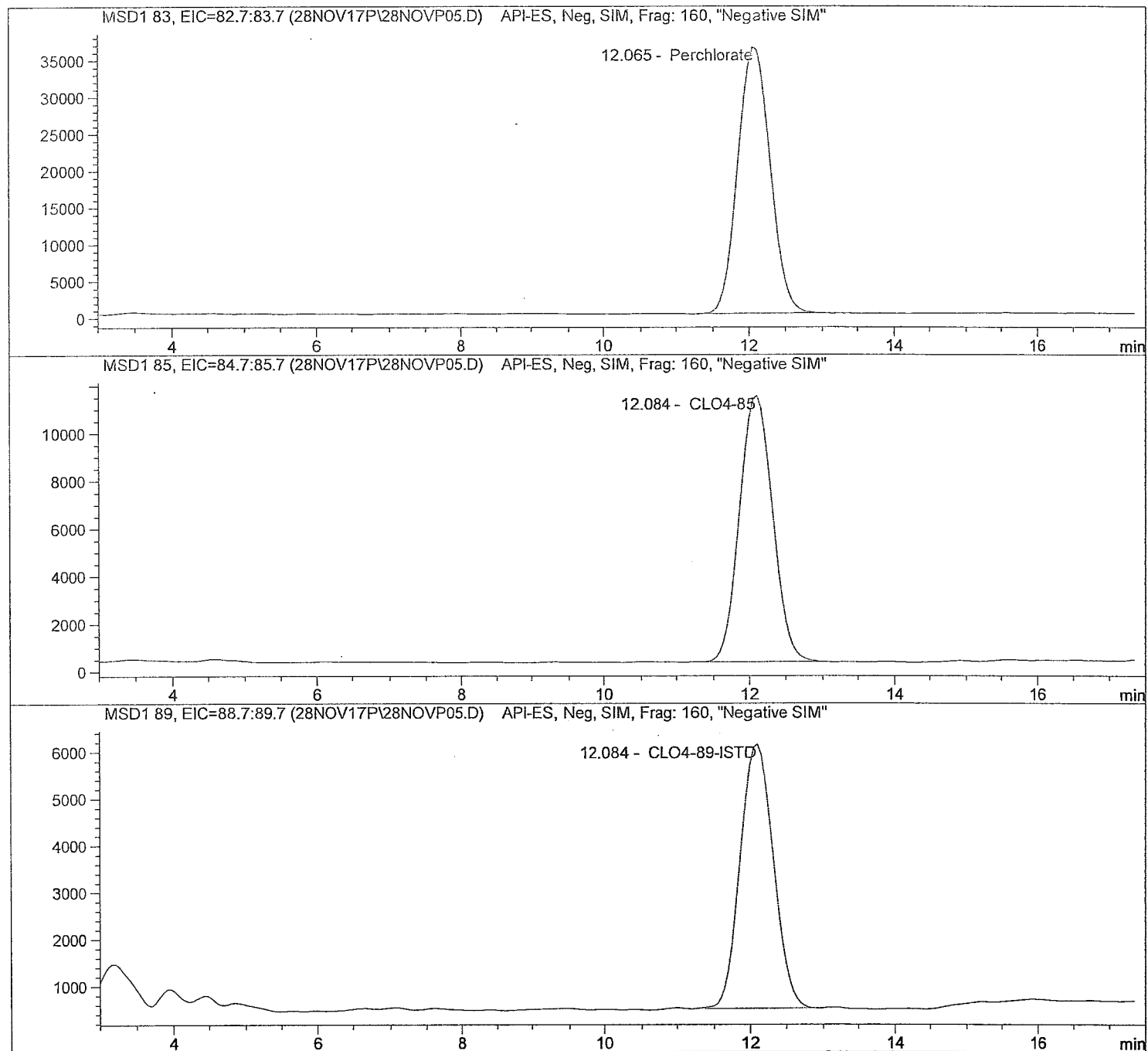
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP05.D

Sample Name: ICAL5@ 25.ug/L

Injection Date:	11/28/2017 10:31:23	Seq Line:	5
Sample Name:	ICAL5@ 25.ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.065	PBA	1097625.1	25.5523	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.084	PBA	346912.7	25.5843	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.084	BBA	175597.1	5.0000	CLO4-89-ISTD

*** End of Report ***

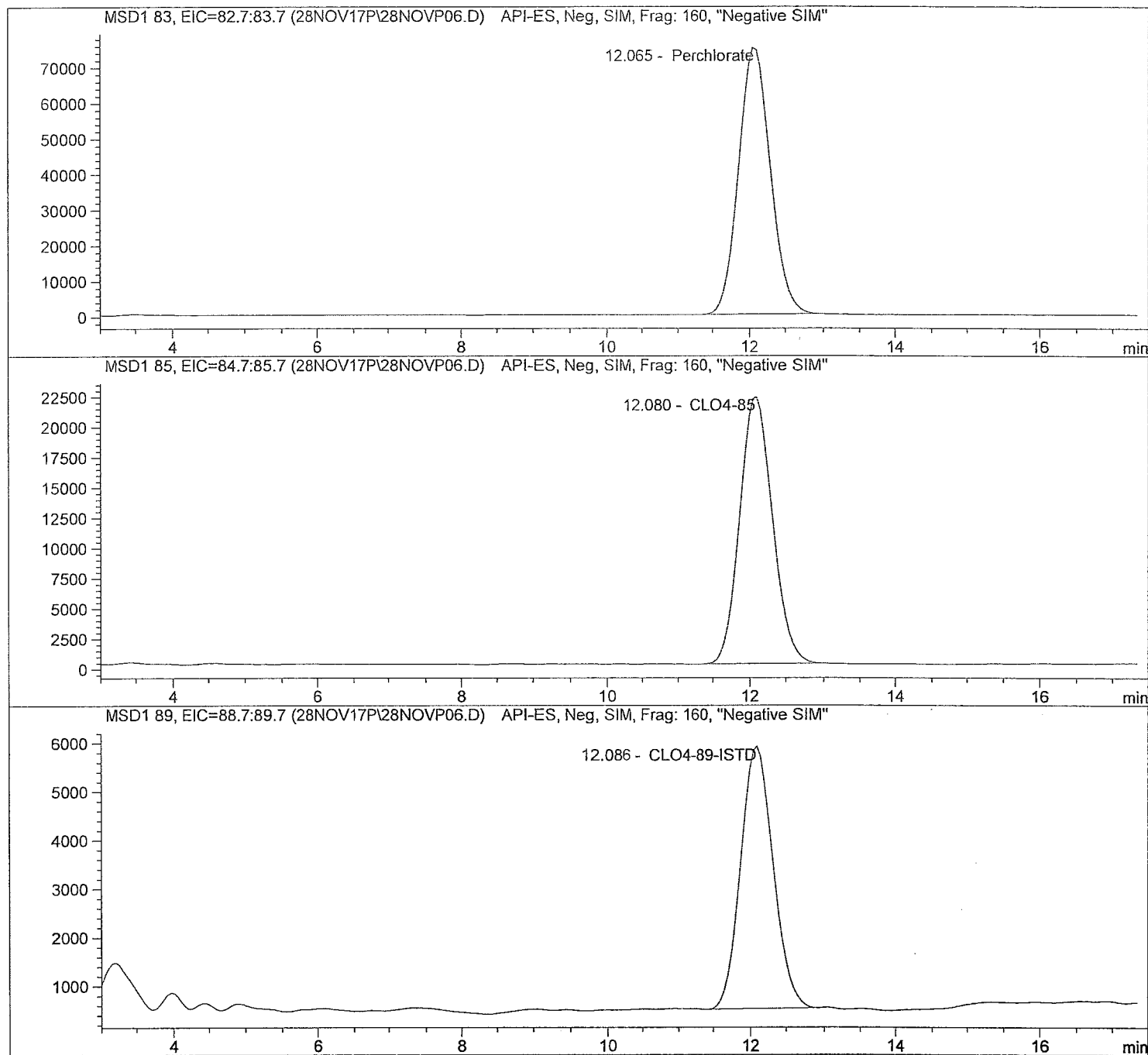
Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP06.D

Sample Name: ICAL6@ 50.ug/L

Injection Date:	11/28/2017 10:50:33	Seq Line:	6
Sample Name:	ICAL6@ 50.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP06.D

Sample Name: ICAL6@ 50.ug/L

Injection Date:	11/28/2017 10:50:33	Seq Line:	6
Sample Name:	ICAL6@ 50.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.065	BBA	2298336.2	49.8316	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.080	PBA	696155.7	49.1828	CLO4-85

Signal13: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.086	PBA	169148.1	5.0000	CLO4-89-ISTD

*** End of Report ***

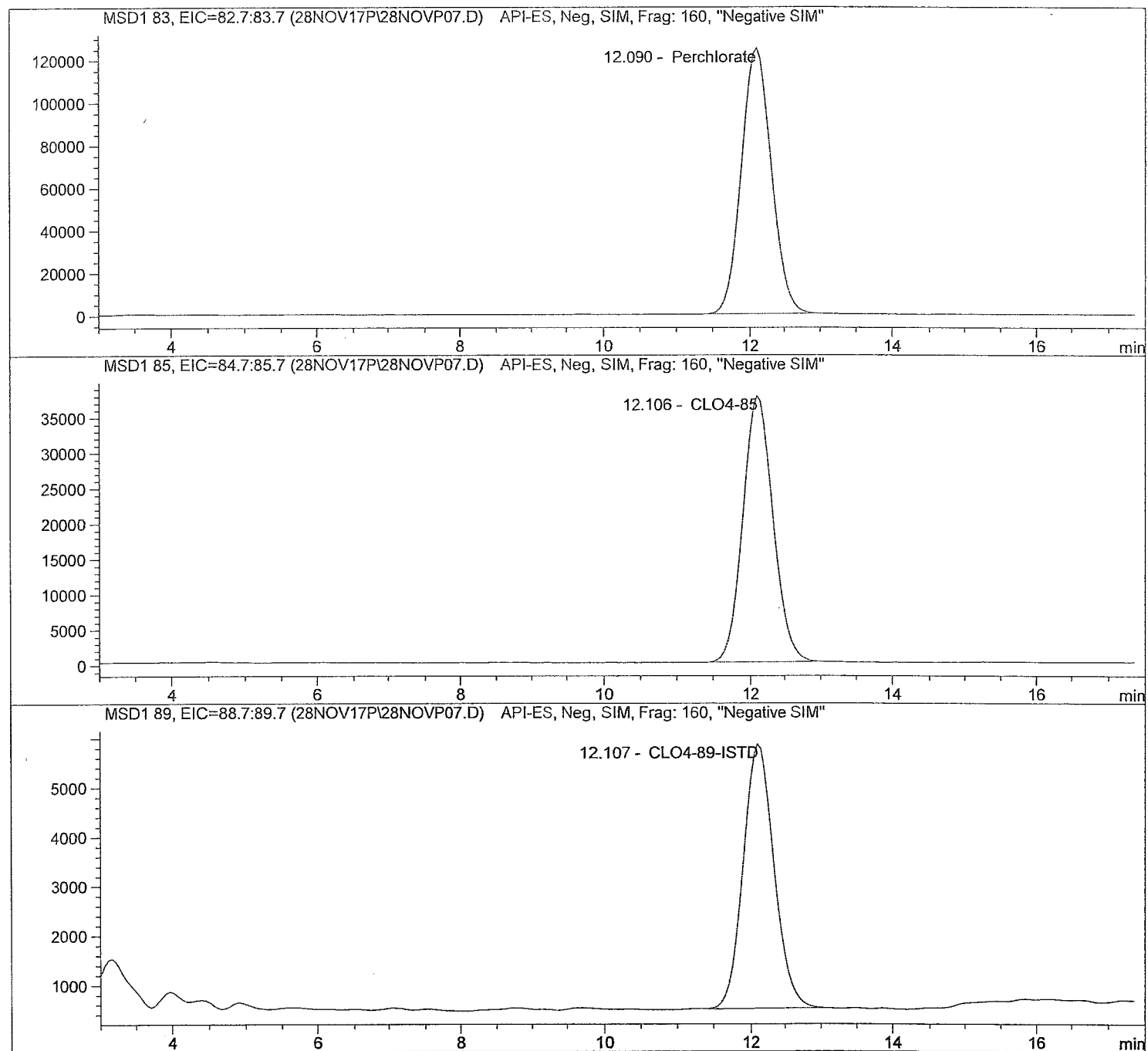
Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP07.D

Sample Name: ICAL7@ 75.ug/L

Injection Date:	11/28/2017 11:09:43	Seq Line:	7
Sample Name:	ICAL7@ 75.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4--DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP07.D

Sample Name: ICAL7@ 75.ug/L

```
=====
Injection Date: 11/28/2017 11:09:43      Seq Line: 7
Sample Name: ICAL7@ 75.ug/L              Location: Vial 77
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017, 08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 75.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.090	PBA	3730211.3	74.9999	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.106	PBA	1130772.0	75.3391	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.107	BBA	164866.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP08.D

Sample Name: ICAL Verf@10ug/L

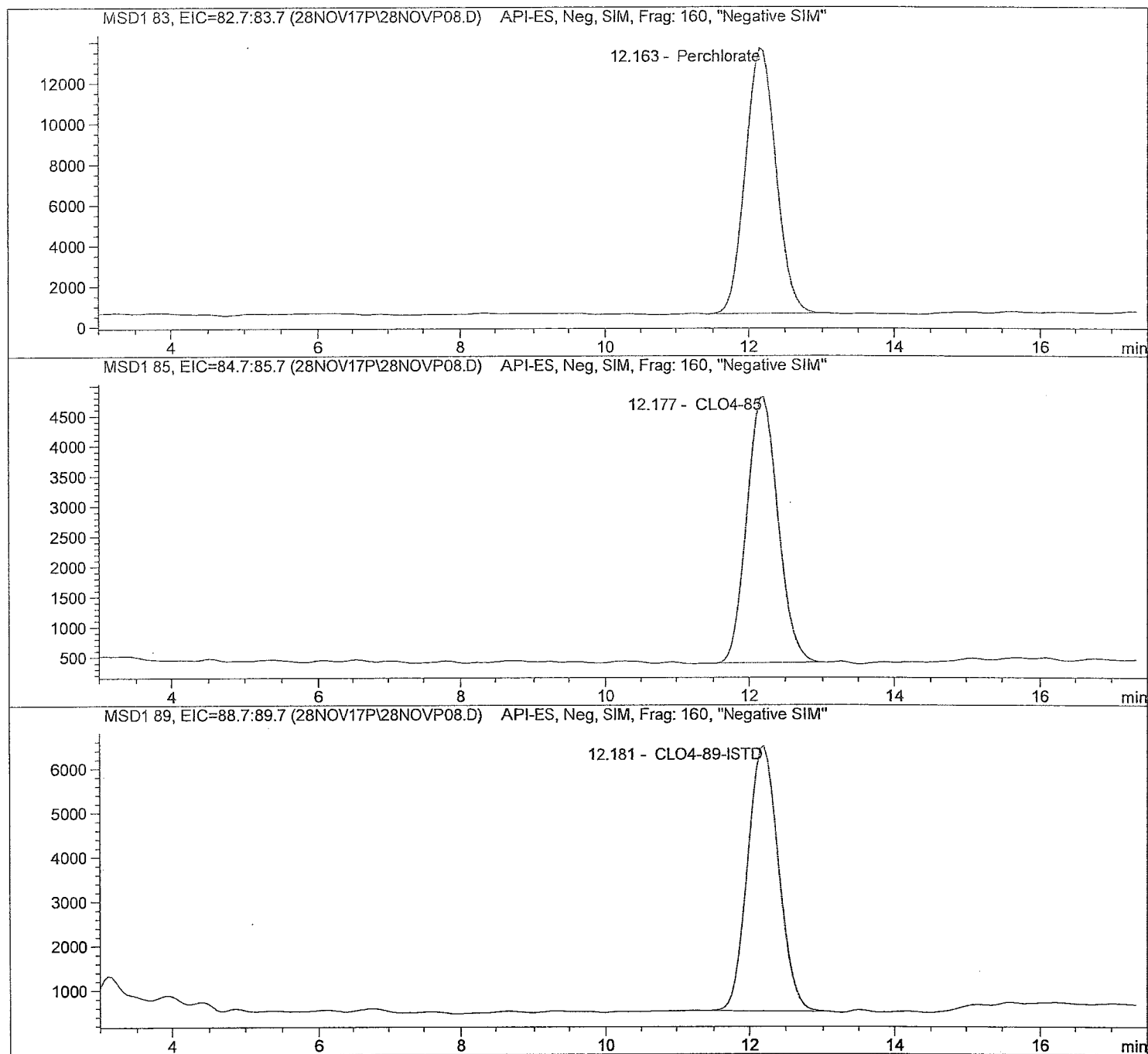
Injection Date:	11/28/2017 11:28:53	Seq Line:	8
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP08.D

Sample Name: ICAL Verif@10ug/L

```

=====
Injection Date: 11/28/2017 11:28:53      Seq Line:      8
Sample Name:    ICAL Verif@10ug/L        Location:      Vial 78
Acq Operator:   TNB                      Inj. No.:      1
                                           Inj. Vol.:     25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   12/3/2017 11:06:36

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.163	PBA	383615.2	9.5953	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.177	PBA	131459.5	10.0855	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.181	BBA	176961.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```




ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

Injection Date: 11/28/2017 09:08:10

Seq Line: 1

Sample Name: ICAL1@ 1.0ug/L

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

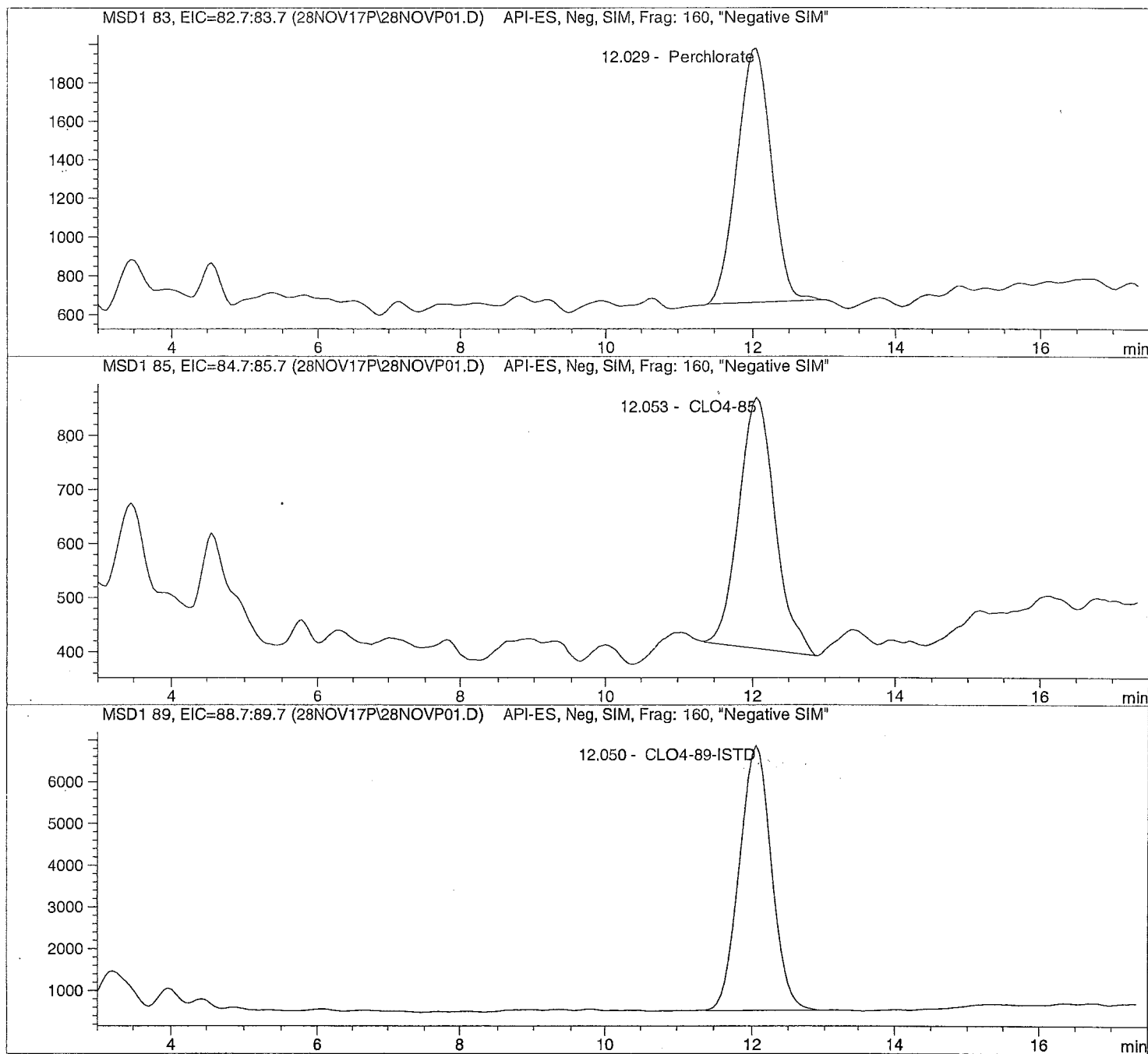
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP01.D

Sample Name: ICAL1@ 1.0ug/L

```

=====
Injection Date: 11/28/2017 09:08:10      Seq Line: 1
Sample Name: ICAL1@ 1.0ug/L      Location: vial 71
Acq Operator: TNB      Inj. No.: 1
                               Inj. Vol.: 25 µl
=====

```

```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.029	BBA	42017.4	1.0510	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.053	BBA	15678.7	0.9871	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.050	BBA	188880.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP02.D

Sample Name: ICAL2@ 2.0ug/L

Injection Date: 11/28/2017 09:33:49

Seq Line: 2

Sample Name: ICAL2@ 2.0ug/L

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

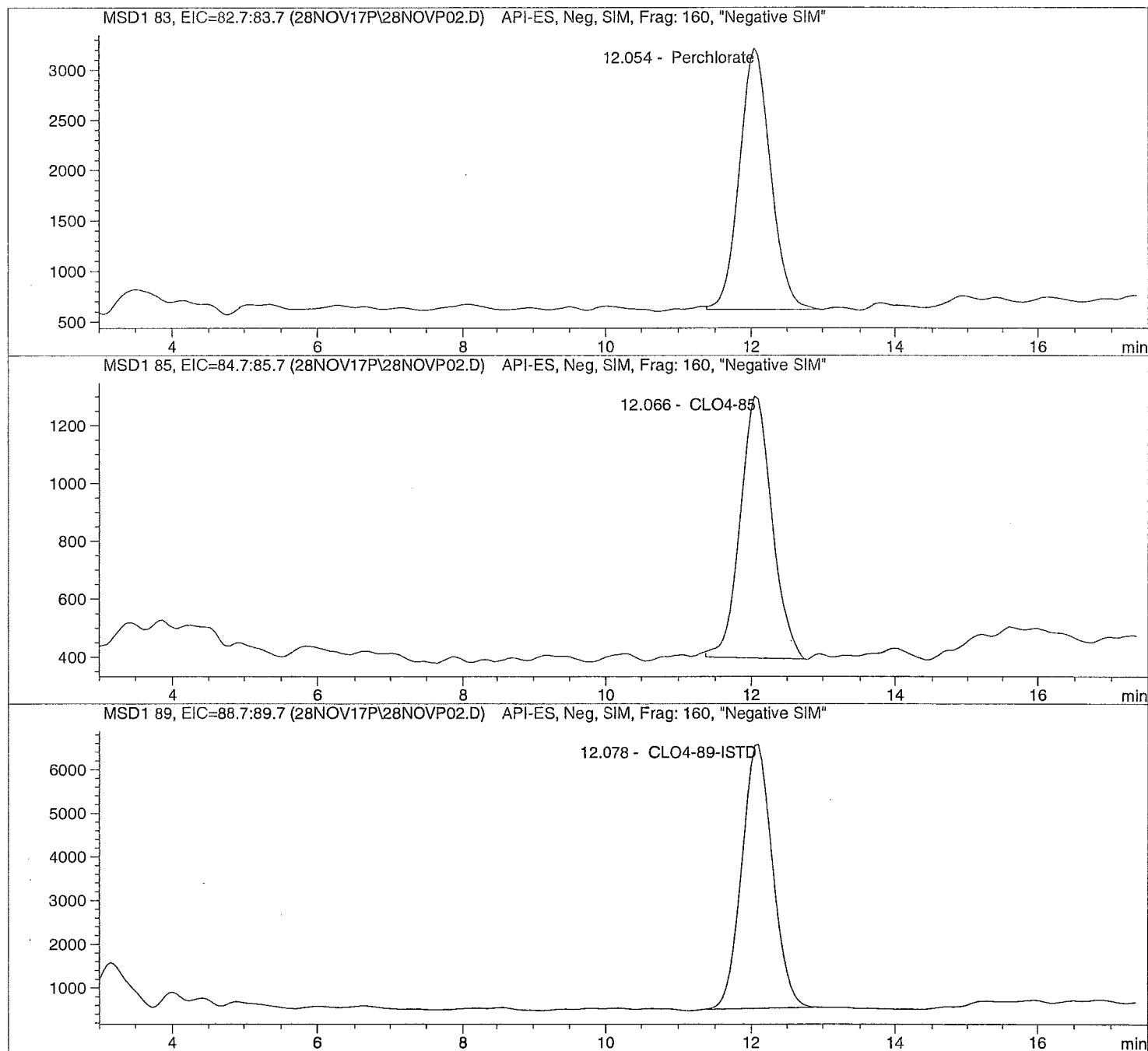
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 12/3/2017 11:06:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28NOV17P\28NOVP02.D

Sample Name: ICAL2@ 2.0ug/L

```
=====
Injection Date: 11/28/2017 09:33:49      Seq Line: 2
Sample Name: ICAL2@ 2.0ug/L              Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2017 11:06:36

Perchlorate analysis

Sample Information

```
=====
Sorted By: Signal
Calib. Data Modified: Wed, 29. Nov. 2017,08:02:06 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 2.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.054	BBA	78519.1	2.0151	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.066	BBA	28009.6	2.0074	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
12.078	PBA	181109.4	5.0000	CLO4-89-ISTD

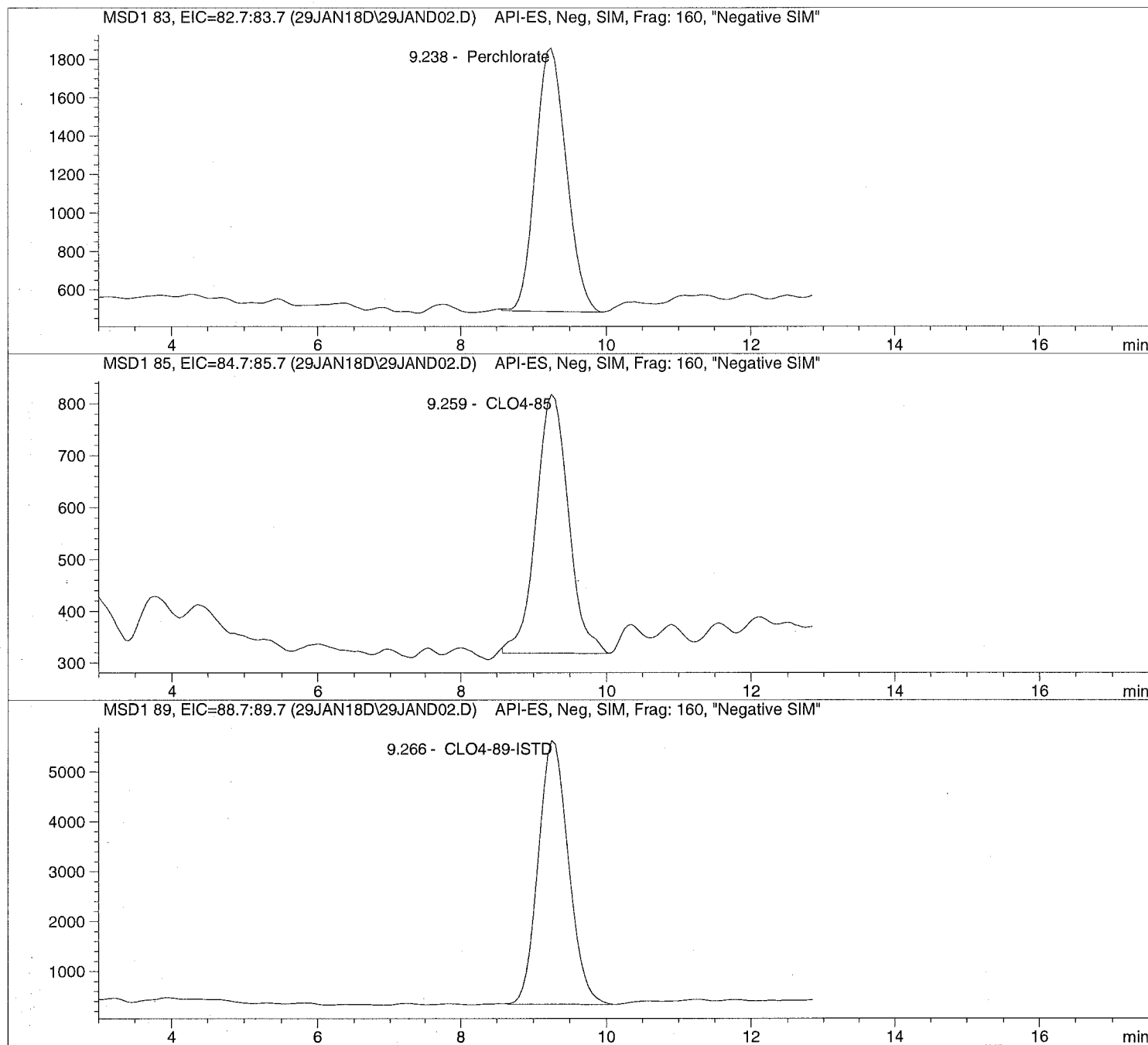
```
=====
*** End of Report ***
=====
```

=====

Injection Date:	1/29/2018 08:53:03	Seq Line:	2
Sample Name:	585116 LODV@1.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date: 1/29/2018 08:53:03      Seq Line: 2
Sample Name: 585116 LODV@1.            Location: Vial 72
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.238	BBA	40297.0	1.2488	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.259	BBA	15415.6	1.2527	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.266	BBA	151728.9	5.0000	CLO4-89-ISTD

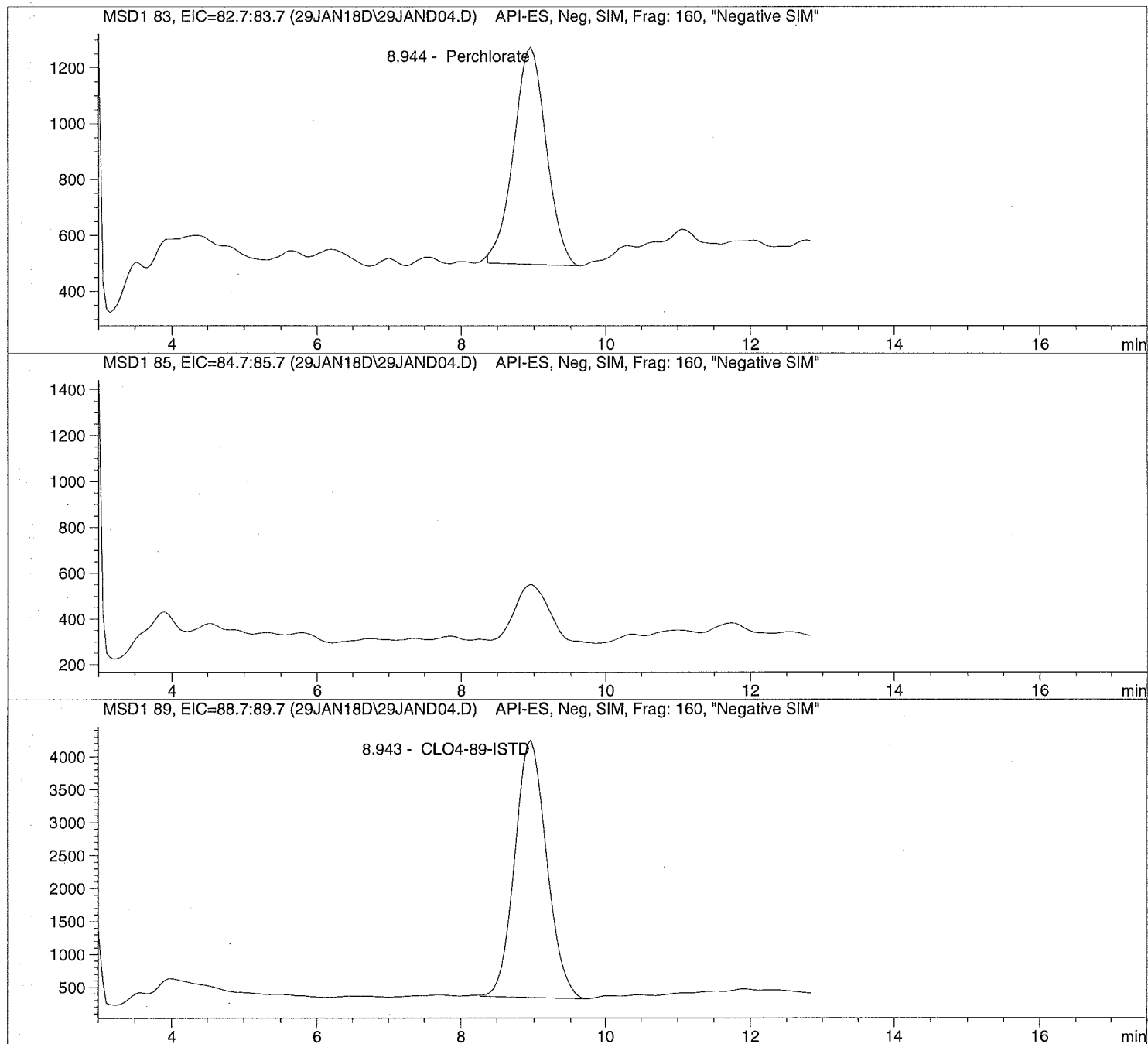
```
=====
*** End of Report ***
=====
```

Injection Date: 1/29/2018 09:28:16
Sample Name: 585117 ICS@1.
Acq Operator: TNB

Seq Line: 4
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



Injection Date: 1/29/2018 09:28:16 Seq Line: 4
Sample Name: 585117 ICS01. Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Thu, 18. Jan. 2018, 08:59:33 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.944	BBA	24012.3	0.9667	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.943	BBA	117654.0	5.0000	CLO4-89-ISTD

*** End of Report ***

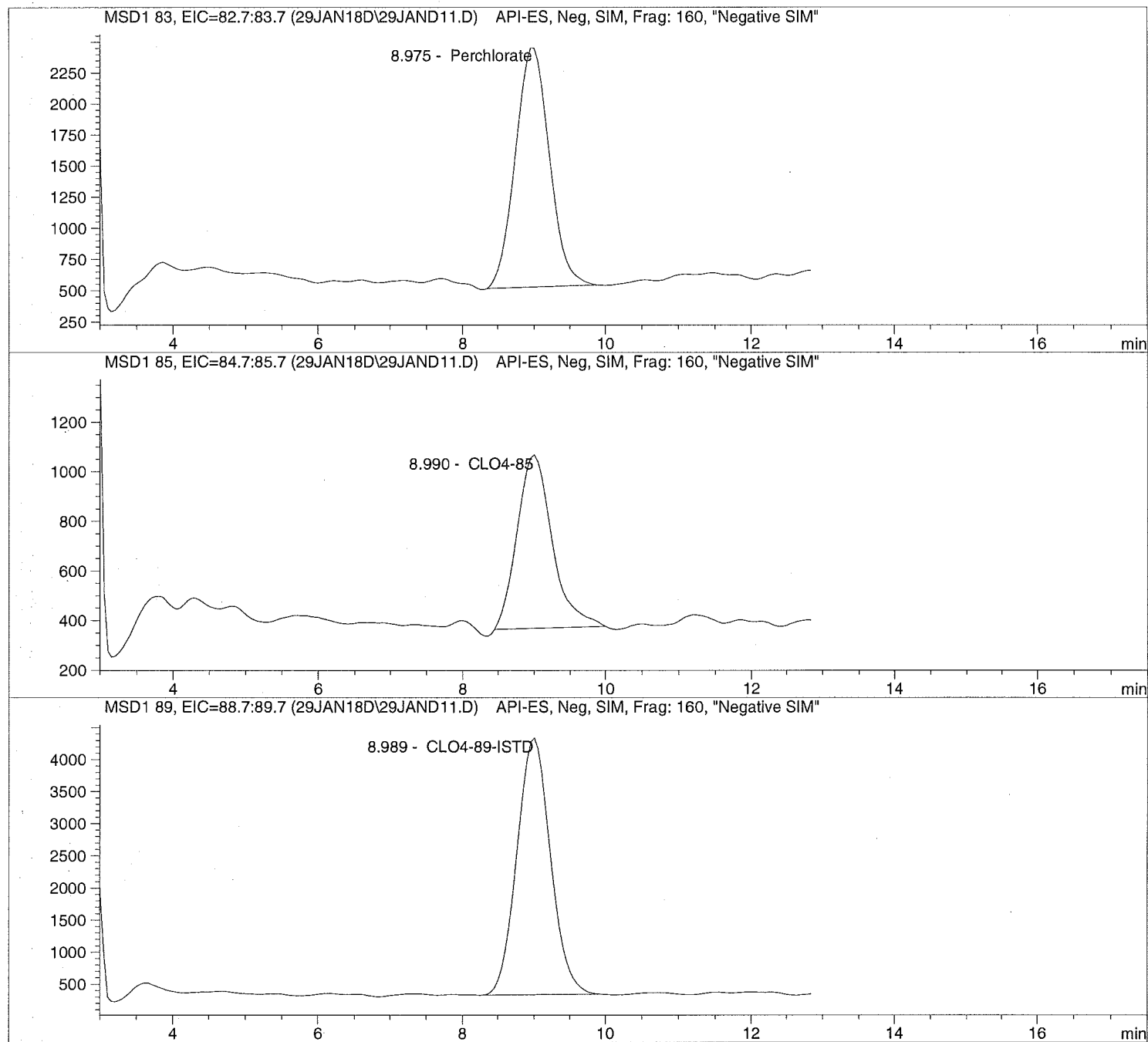
=====

Injection Date:	1/29/2018 11:12:05	Seq Line:	11
Sample Name:	1802229001	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  11:12:05      Seq Line:      11
Sample Name:    1802229001      Location:      Vial 80
Acq Operator:   TNB             Inj. No.:      1
                                      Inj. Vol.:     25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018, 08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.975	PBA	62983.1	2.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.990	PBA	23650.9	2.4089	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.989	PBA	129228.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

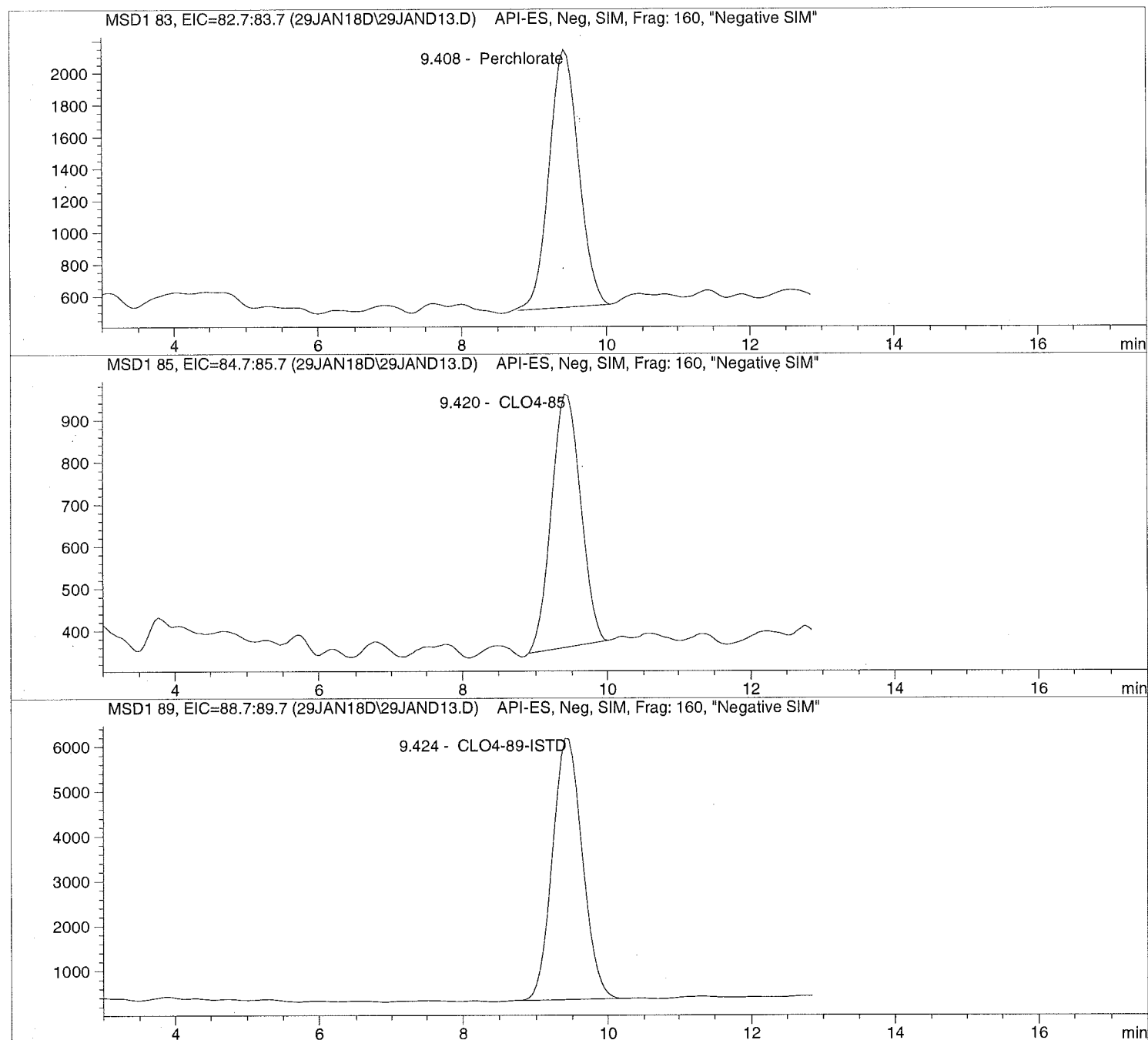
=====

Injection Date:	1/29/2018 11:41:26	Seq Line:	13
Sample Name:	585121 LODV@1.	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date:  1/29/2018  11:41:26      Seq Line:           13
Sample Name:    585121   LODV@1.         Location:           Vial 72
Acq Operator:   TNB                      Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018  12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   1.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.408	PBA	45913.5	1.2838	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.420	PBA	16973.3	1.2442	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.424	BBA	168040.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

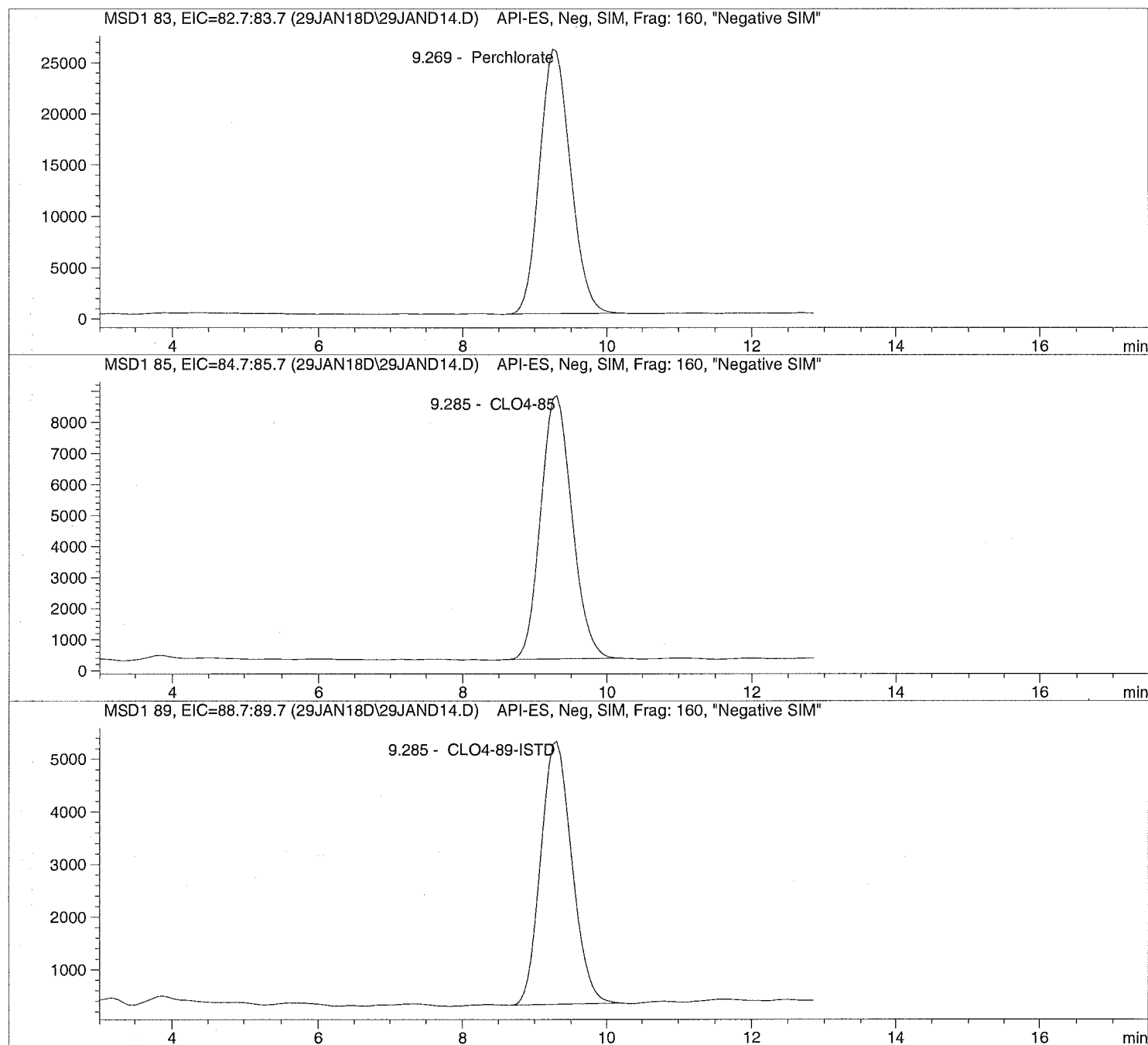
=====

Injection Date:	1/29/2018 11:58:26	Seq Line:	14
Sample Name:	585120 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 1/19/2018 12:46:10

Perchlorate analysis



```
=====
Injection Date: 1/29/2018 11:58:26      Seq Line:      14
Sample Name:    585120    CCV@25        Location:      Vial 71
Acq Operator:   TNB              Inj. No.:      1
                                      Inj. Vol.:     25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   1/19/2018 12:46:10
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Thu, 18. Jan. 2018,08:59:33 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.269	PBA	761722.6	21.4044	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.285	PBA	253307.9	22.3492	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.285	PBA	148394.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 24, 2018

Sharon Pennington
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18020913**

Laboratory Results for: **Longhorn Army Ammunition Plant LHAAP-17**

Dear Sharon,

ALS Environmental received 2 sample(s) on Feb 16, 2018 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: Jumokey.Lawal
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
Work Order: HS18020913

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18020913-01	17TB01-021518	Water	ALS-020218-58	15-Feb-2018 09:30	16-Feb-2018 09:00	☐
HS18020913-02	17WW12-021518	Groundwater		15-Feb-2018 10:40	16-Feb-2018 09:00	☐

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
Work Order:

CASE NARRATIVE**Work Order Comments**

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Volatiles by Method SW8260**Batch ID: R311441****Sample ID: HS18021126-01MS**

- MS and MSD are for an unrelated sample

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant LHAAP-17
 Sample ID: 17TB01-021518
 Collection Date: 15-Feb-2018 09:30

ANALYTICAL REPORT

WorkOrder:HS18020913
 Lab ID:HS18020913-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	23-Feb-2018 01:43
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	23-Feb-2018 01:43
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	23-Feb-2018 01:43
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	23-Feb-2018 01:43
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	23-Feb-2018 01:43
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant LHAAP-17
 Sample ID: 17TB01-021518
 Collection Date: 15-Feb-2018 09:30

ANALYTICAL REPORT

WorkOrder:HS18020913
 Lab ID:HS18020913-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	23-Feb-2018 01:43
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	23-Feb-2018 01:43
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 01:43
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 01:43
Surr: 1,2-Dichloroethane-d4	84.5			0	70-126	%REC	1	23-Feb-2018 01:43
Surr: 4-Bromofluorobenzene	98.3			0	81-113	%REC	1	23-Feb-2018 01:43
Surr: Dibromofluoromethane	87.5			0	77-123	%REC	1	23-Feb-2018 01:43
Surr: Toluene-d8	109			0	82-127	%REC	1	23-Feb-2018 01:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant LHAAP-17
 Sample ID: 17WW12-021518
 Collection Date: 15-Feb-2018 10:40

ANALYTICAL REPORT

WorkOrder:HS18020913
 Lab ID:HS18020913-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	23-Feb-2018 02:08
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	23-Feb-2018 02:08
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	23-Feb-2018 02:08
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	23-Feb-2018 02:08
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	23-Feb-2018 02:08
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant LHAAP-17
 Sample ID: 17WW12-021518
 Collection Date: 15-Feb-2018 10:40

ANALYTICAL REPORT

WorkOrder:HS18020913
 Lab ID:HS18020913-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C			Method:SW8260				Analyst: AKP	
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	23-Feb-2018 02:08
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	23-Feb-2018 02:08
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	23-Feb-2018 02:08
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	23-Feb-2018 02:08
Surr: 1,2-Dichloroethane-d4	86.5			0	70-126	%REC	1	23-Feb-2018 02:08
Surr: 4-Bromofluorobenzene	96.1			0	81-113	%REC	1	23-Feb-2018 02:08
Surr: Dibromofluoromethane	88.9			0	77-123	%REC	1	23-Feb-2018 02:08
Surr: Toluene-d8	107			0	82-127	%REC	1	23-Feb-2018 02:08
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA				Analyst: SUB	
Subcontract Analysis	See Attached		0	0		NA	1	23-Feb-2018 15:46

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R311441	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Groundwater		
HS18020913-02	17WW12-021518	15 Feb 2018 10:40			23 Feb 2018 02:08	1
Batch ID R311441	Test Name : LOW LEVEL VOLATILES BY SW8260C			Matrix: Water		
HS18020913-01	17TB01-021518	15 Feb 2018 09:30			23 Feb 2018 01:43	1
Batch ID R311458	Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater		
HS18020913-02	17WW12-021518	15 Feb 2018 10:40			23 Feb 2018 15:46	1

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW-180222	Units: ug/L		Analysis Date: 23-Feb-2018 01:19					
Client ID:	Run ID: VOA2_311441	SeqNo: 4449797		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	0.50	1.0							U
1,1,1-Trichloroethane	0.50	1.0							U
1,1,2,2-Tetrachloroethane	0.50	1.0							U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0							U
1,1,2-Trichloroethane	0.50	1.0							U
1,1-Dichloroethane	0.50	1.0							U
1,1-Dichloroethene	0.50	1.0							U
1,1-Dichloropropene	0.50	1.0							U
1,2,3-Trichlorobenzene	0.50	1.0							U
1,2,3-Trichloropropane	0.50	1.0							U
1,2,4-Trichlorobenzene	0.50	1.0							U
1,2,4-Trimethylbenzene	0.50	1.0							U
1,2-Dibromo-3-chloropropane	0.50	1.0							U
1,2-Dibromoethane	0.50	1.0							U
1,2-Dichlorobenzene	0.50	1.0							U
1,2-Dichloroethane	0.50	1.0							U
1,2-Dichloropropane	0.50	1.0							U
1,3,5-Trimethylbenzene	0.50	1.0							U
1,3-Dichlorobenzene	0.50	1.0							U
1,3-Dichloropropane	0.50	1.0							U
1,4-Dichlorobenzene	0.50	1.0							U
2,2-Dichloropropane	0.50	1.0							U
2-Butanone	1.0	2.0							U
2-Chlorotoluene	0.50	1.0							U
2-Hexanone	1.0	2.0							U
4-Chlorotoluene	0.50	1.0							U
4-Isopropyltoluene	0.50	1.0							U
4-Methyl-2-pentanone	1.0	2.0							U
Acetone	1.0	2.0							U
Benzene	0.50	1.0							U
Bromobenzene	0.50	1.0							U
Bromochloromethane	0.50	1.0							U
Bromodichloromethane	0.50	1.0							U
Bromoform	0.50	1.0							U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW-180222	Units: ug/L		Analysis Date: 23-Feb-2018 01:19					
Client ID:	Run ID: VOA2_311441	SeqNo: 4449797		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	1.0	2.0							U
Naphthalene	0.50	1.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	42.14	1.0	50	0	84.3	70 - 123			
Surr: 4-Bromofluorobenzene	48.2	1.0	50	0	96.4	82 - 115			
Surr: Dibromofluoromethane	43.25	1.0	50	0	86.5	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260	
MBLK	Sample ID: VBLKW-180222	Units: ug/L		Analysis Date: 23-Feb-2018 01:19	
Client ID:	Run ID: VOA2_311441	SeqNo: 4449797		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>54.17</i>	<i>1.0</i>	<i>50</i>	<i>0 108</i>	<i>81 - 120</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-180222		Units: ug/L		Analysis Date: 23-Feb-2018 00:30				
Client ID:		Run ID: VOA2_311441		SeqNo: 4449795		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	44.41	1.0	50	0	88.8	77 - 118				
1,1,1-Trichloroethane	45.7	1.0	50	0	91.4	70 - 130				
1,1,2,2-Tetrachloroethane	41.05	1.0	50	0	82.1	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	45.71	1.0	50	0	91.4	70 - 130				
1,1,2-Trichloroethane	44.44	1.0	50	0	88.9	77 - 113				
1,1-Dichloroethane	44.51	1.0	50	0	89.0	71 - 122				
1,1-Dichloroethene	46.52	1.0	50	0	93.0	70 - 130				
1,1-Dichloropropene	49.27	1.0	50	0	98.5	78 - 118				
1,2,3-Trichlorobenzene	44.46	1.0	50	0	88.9	70 - 130				
1,2,3-Trichloropropane	42.76	1.0	50	0	85.5	70 - 127				
1,2,4-Trichlorobenzene	44.82	1.0	50	0	89.6	77 - 126				
1,2,4-Trimethylbenzene	46.64	1.0	50	0	93.3	73 - 121				
1,2-Dibromo-3-chloropropane	42.9	1.0	50	0	85.8	70 - 130				
1,2-Dibromoethane	46.38	1.0	50	0	92.8	76 - 123				
1,2-Dichlorobenzene	40.96	1.0	50	0	81.9	77 - 113				
1,2-Dichloroethane	44.88	1.0	50	0	89.8	70 - 124				
1,2-Dichloropropane	45.96	1.0	50	0	91.9	72 - 119				
1,3,5-Trimethylbenzene	47.07	1.0	50	0	94.1	75 - 118				
1,3-Dichlorobenzene	41.78	1.0	50	0	83.6	78 - 118				
1,3-Dichloropropane	43.53	1.0	50	0	87.1	75 - 116				
1,4-Dichlorobenzene	41.1	1.0	50	0	82.2	79 - 113				
2,2-Dichloropropane	42.85	1.0	50	0	85.7	70 - 130				
2-Butanone	94.24	2.0	100	0	94.2	70 - 130				
2-Chlorotoluene	45.95	1.0	50	0	91.9	70 - 128				
2-Hexanone	93.72	2.0	100	0	93.7	70 - 130				
4-Chlorotoluene	46.52	1.0	50	0	93.0	74 - 126				
4-Isopropyltoluene	41.64	1.0	50	0	83.3	74 - 126				
4-Methyl-2-pentanone	86.09	2.0	100	0	86.1	70 - 130				
Acetone	91.83	2.0	100	0	91.8	70 - 130				
Benzene	45.36	1.0	50	0	90.7	74 - 120				
Bromobenzene	40.42	1.0	50	0	80.8	78 - 113				
Bromochloromethane	48.77	1.0	50	0	97.5	76 - 124				
Bromodichloromethane	47.12	1.0	50	0	94.2	74 - 122				
Bromoform	48.3	1.0	50	0	96.6	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-180222		Units: ug/L		Analysis Date: 23-Feb-2018 00:30				
Client ID:		Run ID: VOA2_311441		SeqNo: 4449795		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	48.48	1.0	50	0	97.0	70 - 130				
Carbon disulfide	90.09	2.0	100	0	90.1	70 - 130				
Carbon tetrachloride	44.79	1.0	50	0	89.6	71 - 125				
Chlorobenzene	43.43	1.0	50	0	86.9	76 - 113				
Chloroethane	42.76	1.0	50	0	85.5	70 - 130				
Chloroform	42.82	1.0	50	0	85.6	71 - 121				
Chloromethane	45.07	1.0	50	0	90.1	70 - 129				
cis-1,2-Dichloroethene	46.34	1.0	50	0	92.7	75 - 122				
cis-1,3-Dichloropropene	48.87	1.0	50	0	97.7	73 - 127				
Dibromochloromethane	46.08	1.0	50	0	92.2	77 - 122				
Dibromomethane	49.86	1.0	50	0	99.7	78 - 121				
Dichlorodifluoromethane	41.72	1.0	50	0	83.4	70 - 130				
Ethylbenzene	48.3	1.0	50	0	96.6	77 - 117				
Hexachlorobutadiene	43.09	1.0	50	0	86.2	70 - 130				
Isopropylbenzene	44.13	1.0	50	0	88.3	73 - 127				
m,p-Xylene	86.39	2.0	100	0	86.4	77 - 122				
Methylene chloride	41.47	2.0	50	0	82.9	70 - 127				
Naphthalene	48.1	1.0	50	0	96.2	70 - 130				
n-Butylbenzene	42.6	1.0	50	0	85.2	72 - 130				
n-Propylbenzene	41.25	1.0	50	0	82.5	73 - 124				
o-Xylene	44.33	1.0	50	0	88.7	75 - 119				
sec-Butylbenzene	42.87	1.0	50	0	85.7	73 - 128				
Styrene	44.56	1.0	50	0	89.1	72 - 126				
tert-Butylbenzene	41.4	1.0	50	0	82.8	73 - 124				
Tetrachloroethene	44.82	1.0	50	0	89.6	76 - 119				
Toluene	42.3	1.0	50	0	84.6	77 - 118				
trans-1,2-Dichloroethene	46.06	1.0	50	0	92.1	72 - 127				
trans-1,3-Dichloropropene	50.15	1.0	50	0	100	77 - 119				
Trichloroethene	48.15	1.0	50	0	96.3	77 - 121				
Trichlorofluoromethane	45.11	1.0	50	0	90.2	70 - 130				
Vinyl chloride	46.65	1.0	50	0	93.3	70 - 130				
Surr: 1,2-Dichloroethane-d4	43.56	1.0	50	0	87.1	70 - 130				
Surr: 4-Bromofluorobenzene	50	1.0	50	0	100.0	82 - 115				
Surr: Dibromofluoromethane	41.74	1.0	50	0	83.5	73 - 126				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260	
LCS	Sample ID: VLCSW-180222	Units: ug/L		Analysis Date: 23-Feb-2018 00:30	
Client ID:	Run ID: VOA2_311441	SeqNo: 4449795		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>51.55</i>	<i>1.0</i>	<i>50</i>	<i>0 103</i>	<i>81 - 120</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260						
MS	Sample ID: HS18021126-01MS	Units: ug/L			Analysis Date: 23-Feb-2018 02:57					
Client ID:	Run ID: VOA2_311441	SeqNo: 4449801		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	41.63	1.0	50	0	83.3	70 - 120				
1,1,1-Trichloroethane	45.58	1.0	50	0	91.2	70 - 130				
1,1,2,2-Tetrachloroethane	37.9	1.0	50	0	75.8	70 - 123				
1,1,2-Trichlor-1,2,2-trifluoroethane	46.84	1.0	50	0	93.7	70 - 130				
1,1,2-Trichloroethane	40.22	1.0	50	0	80.4	70 - 117				
1,1-Dichloroethane	41.68	1.0	50	0	83.4	70 - 127				
1,1-Dichloroethene	46.27	1.0	50	0	92.5	70 - 130				
1,1-Dichloropropene	48.35	1.0	50	0	96.7	70 - 129				
1,2,3-Trichlorobenzene	40.8	1.0	50	0	81.6	70 - 130				
1,2,3-Trichloropropane	38.13	1.0	50	0	76.3	70 - 130				
1,2,4-Trichlorobenzene	41.9	1.0	50	0	83.8	70 - 125				
1,2,4-Trimethylbenzene	43.9	1.0	50	0	87.8	70 - 125				
1,2-Dibromo-3-chloropropane	38.65	1.0	50	0	77.3	70 - 130				
1,2-Dibromoethane	42.16	1.0	50	0	84.3	70 - 124				
1,2-Dichlorobenzene	38.28	1.0	50	0	76.6	70 - 115				
1,2-Dichloroethane	40.08	1.0	50	0	80.2	70 - 127				
1,2-Dichloropropane	41.78	1.0	50	0	83.6	70 - 122				
1,3,5-Trimethylbenzene	45.38	1.0	50	0	90.8	70 - 126				
1,3-Dichlorobenzene	39.47	1.0	50	0	78.9	70 - 119				
1,3-Dichloropropane	39.32	1.0	50	0	78.6	70 - 121				
1,4-Dichlorobenzene	38.39	1.0	50	0	76.8	70 - 114				
2,2-Dichloropropane	41.09	1.0	50	0	82.2	70 - 130				
2-Butanone	85.13	2.0	100	0	85.1	70 - 130				
2-Chlorotoluene	44.06	1.0	50	0	88.1	70 - 130				
2-Hexanone	84.7	2.0	100	0	84.7	70 - 130				
4-Chlorotoluene	43.19	1.0	50	0	86.4	70 - 130				
4-Isopropyltoluene	40.47	1.0	50	0	80.9	70 - 130				
4-Methyl-2-pentanone	78.1	2.0	100	0	78.1	70 - 130				
Acetone	85.46	2.0	100	0	85.5	70 - 130				
Benzene	42.66	1.0	50	0	85.3	70 - 127				
Bromobenzene	37.72	1.0	50	0	75.4	70 - 115				
Bromochloromethane	44.79	1.0	50	0	89.6	70 - 127				
Bromodichloromethane	42.79	1.0	50	0	85.6	70 - 124				
Bromoform	44.25	1.0	50	0	88.5	70 - 129				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260						
MS		Sample ID: HS18021126-01MS		Units: ug/L		Analysis Date: 23-Feb-2018 02:57				
Client ID:		Run ID: VOA2_311441		SeqNo: 4449801		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	46.05	1.0	50	0	92.1	70 - 130				
Carbon disulfide	88.36	2.0	100	0	88.4	70 - 130				
Carbon tetrachloride	45.05	1.0	50	0	90.1	70 - 130				
Chlorobenzene	40.69	1.0	50	0	81.4	70 - 114				
Chloroethane	38.16	1.0	50	0	76.3	70 - 130				
Chloroform	39.94	1.0	50	0	79.9	70 - 125				
Chloromethane	41.24	1.0	50	0	82.5	70 - 130				
cis-1,2-Dichloroethene	43.99	1.0	50	0	88.0	70 - 128				
cis-1,3-Dichloropropene	44.34	1.0	50	0	88.7	70 - 125				
Dibromochloromethane	42.08	1.0	50	0	84.2	70 - 124				
Dibromomethane	45.66	1.0	50	0	91.3	70 - 124				
Dichlorodifluoromethane	31.66	1.0	50	0	63.3	70 - 130				S
Ethylbenzene	47.76	1.0	50	0	95.5	70 - 124				
Hexachlorobutadiene	42.63	1.0	50	0	85.3	70 - 130				
Isopropylbenzene	43.58	1.0	50	0	87.2	70 - 130				
m,p-Xylene	83.5	2.0	100	0	83.5	70 - 130				
Methylene chloride	38.9	2.0	50	0	77.8	70 - 128				
Naphthalene	44.07	1.0	50	0	88.1	70 - 130				
n-Butylbenzene	42.2	1.0	50	0	84.4	70 - 130				
n-Propylbenzene	40.09	1.0	50	0	80.2	70 - 130				
o-Xylene	41.92	1.0	50	0	83.8	70 - 124				
sec-Butylbenzene	42.57	1.0	50	0	85.1	70 - 130				
Styrene	40.78	1.0	50	0	81.6	70 - 130				
tert-Butylbenzene	40.83	1.0	50	0	81.7	70 - 130				
Tetrachloroethene	44.36	1.0	50	0	88.7	70 - 130				
Toluene	40.87	1.0	50	0	81.7	70 - 123				
trans-1,2-Dichloroethene	45.11	1.0	50	0	90.2	70 - 130				
trans-1,3-Dichloropropene	44.83	1.0	50	0	89.7	70 - 121				
Trichloroethene	46.53	1.0	50	0	93.1	70 - 129				
Trichlorofluoromethane	44.79	1.0	50	0	89.6	70 - 130				
Vinyl chloride	44.5	1.0	50	0	89.0	70 - 130				
Surr: 1,2-Dichloroethane-d4	44.09	1.0	50	0	88.2	70 - 126				
Surr: 4-Bromofluorobenzene	50.64	1.0	50	0	101	81 - 113				
Surr: Dibromofluoromethane	41.5	1.0	50	0	83.0	77 - 123				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260	
MS	Sample ID: HS18021126-01MS	Units: ug/L		Analysis Date: 23-Feb-2018 02:57	
Client ID:	Run ID: VOA2_311441	SeqNo: 4449801		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>51.71</i>	<i>1.0</i>	<i>50</i>	<i>0 103</i>	<i>82 - 127</i>

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260					
MSD		Sample ID: HS18021126-01MSD		Units: ug/L		Analysis Date: 23-Feb-2018 03:21			
Client ID:		Run ID: VOA2_311441		SeqNo: 4449802		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	41.11	1.0	50	0	82.2	70 - 120	41.63	1.25	20
1,1,1-Trichloroethane	43.47	1.0	50	0	86.9	70 - 130	45.58	4.75	20
1,1,2,2-Tetrachloroethane	36.93	1.0	50	0	73.9	70 - 123	37.9	2.59	20
1,1,2-Trichlor-1,2,2-trifluoroethane	44.4	1.0	50	0	88.8	70 - 130	46.84	5.35	20
1,1,2-Trichloroethane	40.58	1.0	50	0	81.2	70 - 117	40.22	0.888	20
1,1-Dichloroethane	40.93	1.0	50	0	81.9	70 - 127	41.68	1.81	20
1,1-Dichloroethene	43.93	1.0	50	0	87.9	70 - 130	46.27	5.2	20
1,1-Dichloropropene	46.92	1.0	50	0	93.8	70 - 129	48.35	3.01	20
1,2,3-Trichlorobenzene	42.34	1.0	50	0	84.7	70 - 130	40.8	3.71	20
1,2,3-Trichloropropane	38.24	1.0	50	0	76.5	70 - 130	38.13	0.305	20
1,2,4-Trichlorobenzene	40.91	1.0	50	0	81.8	70 - 125	41.9	2.37	20
1,2,4-Trimethylbenzene	43.13	1.0	50	0	86.3	70 - 125	43.9	1.78	20
1,2-Dibromo-3-chloropropane	39.55	1.0	50	0	79.1	70 - 130	38.65	2.29	20
1,2-Dibromoethane	42.09	1.0	50	0	84.2	70 - 124	42.16	0.17	20
1,2-Dichlorobenzene	37.5	1.0	50	0	75.0	70 - 115	38.28	2.06	20
1,2-Dichloroethane	39.43	1.0	50	0	78.9	70 - 127	40.08	1.65	20
1,2-Dichloropropane	40.83	1.0	50	0	81.7	70 - 122	41.78	2.31	20
1,3,5-Trimethylbenzene	43.59	1.0	50	0	87.2	70 - 126	45.38	4.04	20
1,3-Dichlorobenzene	38.02	1.0	50	0	76.0	70 - 119	39.47	3.74	20
1,3-Dichloropropane	39.64	1.0	50	0	79.3	70 - 121	39.32	0.802	20
1,4-Dichlorobenzene	37.42	1.0	50	0	74.8	70 - 114	38.39	2.56	20
2,2-Dichloropropane	38.24	1.0	50	0	76.5	70 - 130	41.09	7.18	20
2-Butanone	86.41	2.0	100	0	86.4	70 - 130	85.13	1.49	20
2-Chlorotoluene	42.54	1.0	50	0	85.1	70 - 130	44.06	3.5	20
2-Hexanone	84.51	2.0	100	0	84.5	70 - 130	84.7	0.224	20
4-Chlorotoluene	42.48	1.0	50	0	85.0	70 - 130	43.19	1.65	20
4-Isopropyltoluene	38.92	1.0	50	0	77.8	70 - 130	40.47	3.9	20
4-Methyl-2-pentanone	79.2	2.0	100	0	79.2	70 - 130	78.1	1.4	20
Acetone	82.29	2.0	100	0	82.3	70 - 130	85.46	3.78	20
Benzene	41.8	1.0	50	0	83.6	70 - 127	42.66	2.04	20
Bromobenzene	36.11	1.0	50	0	72.2	70 - 115	37.72	4.36	20
Bromochloromethane	43.33	1.0	50	0	86.7	70 - 127	44.79	3.31	20
Bromodichloromethane	42.06	1.0	50	0	84.1	70 - 124	42.79	1.74	20
Bromoform	44.11	1.0	50	0	88.2	70 - 129	44.25	0.308	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260					
MSD		Sample ID: HS18021126-01MSD		Units: ug/L		Analysis Date: 23-Feb-2018 03:21			
Client ID:		Run ID: VOA2_311441		SeqNo: 4449802		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	43.7	1.0	50	0	87.4	70 - 130	46.05	5.23	20
Carbon disulfide	85.16	2.0	100	0	85.2	70 - 130	88.36	3.69	20
Carbon tetrachloride	43.1	1.0	50	0	86.2	70 - 130	45.05	4.44	20
Chlorobenzene	39.78	1.0	50	0	79.6	70 - 114	40.69	2.25	20
Chloroethane	35.3	1.0	50	0	70.6	70 - 130	38.16	7.8	20
Chloroform	38.68	1.0	50	0	77.4	70 - 125	39.94	3.2	20
Chloromethane	39.3	1.0	50	0	78.6	70 - 130	41.24	4.81	20
cis-1,2-Dichloroethene	42.95	1.0	50	0	85.9	70 - 128	43.99	2.39	20
cis-1,3-Dichloropropene	43.04	1.0	50	0	86.1	70 - 125	44.34	2.98	20
Dibromochloromethane	42.62	1.0	50	0	85.2	70 - 124	42.08	1.27	20
Dibromomethane	44.09	1.0	50	0	88.2	70 - 124	45.66	3.5	20
Dichlorodifluoromethane	30.98	1.0	50	0	62.0	70 - 130	31.66	2.18	20 S
Ethylbenzene	46.53	1.0	50	0	93.1	70 - 124	47.76	2.62	20
Hexachlorobutadiene	42.08	1.0	50	0	84.2	70 - 130	42.63	1.29	20
Isopropylbenzene	42.44	1.0	50	0	84.9	70 - 130	43.58	2.64	20
m,p-Xylene	81.81	2.0	100	0	81.8	70 - 130	83.5	2.04	20
Methylene chloride	38.15	2.0	50	0	76.3	70 - 128	38.9	1.95	20
Naphthalene	44.04	1.0	50	0	88.1	70 - 130	44.07	0.075	20
n-Butylbenzene	41.11	1.0	50	0	82.2	70 - 130	42.2	2.62	20
n-Propylbenzene	38.75	1.0	50	0	77.5	70 - 130	40.09	3.39	20
o-Xylene	41.32	1.0	50	0	82.6	70 - 124	41.92	1.46	20
sec-Butylbenzene	41.18	1.0	50	0	82.4	70 - 130	42.57	3.31	20
Styrene	41.01	1.0	50	0	82.0	70 - 130	40.78	0.547	20
tert-Butylbenzene	39.58	1.0	50	0	79.2	70 - 130	40.83	3.12	20
Tetrachloroethene	44.14	1.0	50	0	88.3	70 - 130	44.36	0.502	20
Toluene	39.95	1.0	50	0	79.9	70 - 123	40.87	2.29	20
trans-1,2-Dichloroethene	44.68	1.0	50	0	89.4	70 - 130	45.11	0.959	20
trans-1,3-Dichloropropene	44.07	1.0	50	0	88.1	70 - 121	44.83	1.71	20
Trichloroethene	44.82	1.0	50	0	89.6	70 - 129	46.53	3.75	20
Trichlorofluoromethane	43.43	1.0	50	0	86.9	70 - 130	44.79	3.09	20
Vinyl chloride	41.34	1.0	50	0	82.7	70 - 130	44.5	7.36	20
Surr: 1,2-Dichloroethane-d4	43.14	1.0	50	0	86.3	70 - 126	44.09	2.18	20
Surr: 4-Bromofluorobenzene	50.24	1.0	50	0	100	81 - 113	50.64	0.781	20
Surr: Dibromofluoromethane	41.4	1.0	50	0	82.8	77 - 123	41.5	0.23	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

QC BATCH REPORT

Batch ID: R311441		Instrument: VOA2		Method: SW8260	
MSD	Sample ID: HS18021126-01MSD	Units: ug/L		Analysis Date: 23-Feb-2018 03:21	
Client ID:	Run ID: VOA2_311441	SeqNo: 4449802		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	52	1.0	50	0 104	82 - 127 51.71 0.547 20

The following samples were analyzed in this batch: HS18020913-01 HS18020913-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 24-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant LHAAP-17
WorkOrder: HS18020913

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18020913

Date/Time Received: **16-Feb-2018 09:00**
Received by: **JRM**

Checklist completed by: Pablo Martinez 17-Feb-2018
eSignature Date

Reviewed by: Corey Grandits 19-Feb-2018
eSignature Date

Matrices: **WATER**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 2.3C/2.9C UC/C IR # 25

Cooler(s)/Kit(s): 43730

Date/Time sample(s) sent to storage: 2/17/2018 13:10

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:

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant LHAAP-17



Mail Reports To Sharon Pennington

Address	2410 Cherahala Blvd.
---------	----------------------

City	Knoxville
------	-----------

State	TN
-------	----

Postal Code	37932
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Country	USA
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Shipping Company

FEDEX

ANALYSIS REQUESTED

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

5 DAY TAT

[illegible]

DATE/TIME

ACCEPTED BY/AFFILIATION

DATE/TIME

RIGHT SOLUTIONS | RIGHT PARTNER

Cocher 43730
Tungys 2-34C

1025

CF - 0.6



Must Deliver Next Business Day
Time and Temperature Sensitive!

ORIGIN ID: SGRA (903) 930-6199
SCOTT BEESINGER
APTM ENVIRONMENTAL & INFRASTRUCTURE
1203-B EAST GRAND AVE
PMB 202
MARSHALL, TX 75670
UNITED STATES US

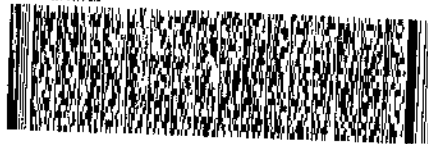
SHIP DATE: 07FEB19
ACTWGT: 1.50 LB MAN
CAD: 300190/04FE3108

TO CLIENT SERVICES
ALS LABORATORY GROUP
1045 J STANCLIFF ROAD
SUITE 21J
HOUSTON TX 77099

(281) 530-6666

REF: LHAAP-37- J

FIMA: 01/11/19



FedEx
TRK# 7376 9752 2666
0221

FRI - 16 FEB 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH



0415872 02/15 55211/1920/0045

CUSTODY
DATE: 02-15-19
Signature: [Signature]
LHA

SEAL
15-18
AP [Signature]

CUSTODY
DATE: 02-15-19
Signature: [Signature]
LHA

SEAL
15-18
AP [Signature]



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1804763; 1804764; 1804765;
1805239; 1805240; 1805310

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2053 (209112)

General Set Information: There were seven field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Sample 1804765001 was analyzed and reported at a 1:1,000 dilution. Sample 1805310001 was re-analyzed and reported at a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 588565) was less than 1/2 the CRDL. The recovery for the LCS (588566) was within acceptable parameters.

MS/MSD Analysis: The matrix spike and matrix spike duplicate (MS/MSD) was performed on sample 1804763001 (Client ID: LH18/24-SP650_021418). The Matrix Spike and duplicate (MS/MSD – 588567/68) failed QC acceptance criteria for percent recoveries. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) was within the performance limits.



Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in $\mu\text{g/L}$. Results were calculated in $\mu\text{g/L}$ by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve ($\mu\text{g/L}$)

B = Dilution performed at time of analysis

Miscellaneous Comments: The 83/85 ion ratio failed for the Limit of Detection Verification standard (LODV1 – 588563). These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1. Manual Integrations were performed for datafiles 22FEBD21/26.

Thomas Bosch	February 23, 2018
Analyst	Date



ANALYTICAL REPORT

Report Date: February 23, 2018

RJ Masahisa
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1805240**

Project ID: HS18020913 021518

Purchase Order: HS18020913

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
17WW12-021518	1805240001	02/15/18	02/21/18	



ANALYTICAL REPORT

Workorder: **34-1805240**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: 17WW12-021518		Sampling Site: NA		Collected: 02/15/2018		
Lab ID: 1805240001		Media: 125 mL Nalgene		Received: 02/21/2018		
Matrix: Water		Sampling Parameter: NA				
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water		Instrument ID: LCMS04	
			Batch: ELMS/2053 (HBN: 209112)		Percent Solid: NA	
			Analyzed: 02/22/2018 19:47		Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 209112)

The Matrix Spike and duplicate (MS/MSD – 588567/68) failed QC acceptance criteria for percent recoveries. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 02/23/2018 09:38	/S/ Stephen Brose 02/23/2018 11:13

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: als@alsglobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: **34-1805240**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint ,Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com



ANALYTICAL REPORT

Workorder: 34-1805240

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.

RL = Reporting Limit, a verified value of method/media/instrument sensitivity.

CRDL = Contract Required Detection Limit

Reg. Limit = Regulatory Limit.

ND = Not Detected, testing result not detected above the MDL or RL.

< This testing result is less than the numerical value.

** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.

J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.

B = Qualifier indicates that the analyte was detected in the blank.

E = Qualifier indicates that the analyte result exceeds calibration range.

P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00898873

Analysis Information

Workorder: 1805240

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850

Basis: DoD QSM

Batch: NA

Batch: ELMS/2053 (HBN: 209112)

Prepared By: NA

Analyzed By: Thomas Bosch

Blank

LMB: 588565

Analyzed: 02/22/2018 17:50

Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 588566

Analyzed: 02/22/2018 18:04

Dilution: 1

Units: ug/L

Analyte	Result	Target	% Rec	QC Limits
Perchlorate	4.72	5.00	94.4	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1804763001

Analyzed: 02/22/2018 18:19

Dilution: 1

Units: ug/L

MS: 588567

Analyzed: 02/22/2018 18:34

Dilution: 1

Units: ug/L

MSD: 588568

Analyzed: 02/22/2018 18:48

Dilution: 1

Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	6.41	5 #	128	78.8 123.8	6.43 #	129	0.269	0.0 20.0

Continuing Calibration Verification

CCV: 588562

Analyzed: 02/22/2018 16:51

Units: ug/L

Criteria: ± 15%

CCV: 588569

Analyzed: 02/22/2018 20:46

Units: ug/L

Criteria: ± 15%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	23.6	25.0	94.4	28.1	25.0	112

Interference Check Sample

ICSA: 588564

Analyzed: 02/22/2018 17:20

Units: ug/L

Criteria: ± 30%

Analyte	Result	Target	% Rec.
Perchlorate	1.16	1.00	116

Limit of Detection Verification

LODV: 588563

Analyzed: 02/22/2018 17:06

Units: ug/L

Criteria: ± 50%

LODV: 588570

Analyzed: 02/22/2018 21:00

Units: ug/L

Criteria: ± 50%

Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	0.999	1.00	99.9	1.20	1.00	120



Quality Control Sample Batch Report

00898874

Analysis Information

Workorder: 1805240

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850

Basis: DoD QSM

Batch: NA

Batch: ELMS/2053 (HBN: 209112)

Prepared By: NA

Analyzed By: Thomas Bosch

Comments

The Matrix Spike and duplicate (MS/MSD – 588567/68) failed QC acceptance criteria for percent recoveries. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 02/23/2018 09:38	/S/ Stephen Brose 02/23/2018 11:13

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable



1805240

18698/#2

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

COC ID: 8636

SUBCONTRACT TO:

ALS Laboratory Group
960 West LeVoy Drive
Salt Lake City, UT 84123

Phone: +1 800 356 9135

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@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: HS18020913
TSR: Sonia West

1805240

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS18020913-02	17WW12-021518	Water	15 Feb 2018 10:40
SUB_Perch-6850			23 Feb 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By:

Date/Time:

2/19/18 1800.

Received By:

Date/Time:

02-21-18 10:25

Cooler ID(s):

Temperature(s):

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>1805240</u>							
Date/Time of Receipt: <u>02-21-18 10:25</u>		Number of Coolers Received: <u>1</u>							
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>							
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>							
Container Custody Seals: <u>Present/Absent/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>							
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? <u>Yes/No/NA</u>							
pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA			
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA			
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA			
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA			
Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	
	1	C18 8265	6 °C	4	C18	°C	7	C18	°C
	2	C18 8266	6 °C	5	C18	°C	8	C18	°C
	3	C18	°C	6	C18	°C	9	C18	°C
Taken By: <u>Tamara Jassell</u>		<u>Tamara Jassell</u>		<u>02-21-18</u>					
		Signature		Printed Name				Date	

CLIENT-RELATED INFORMATION

- | | | | |
|--|---|--|---|
| ☐ Missing Cooler | ☐ Missing Samples/Bottles | ☐ Incorrect Preservation | ☐ Insufficient Sample Volume |
| ☐ Cooler Conditions | ☐ Broken/Leaking Samples | ☐ pH Criteria Not Met | ☐ Chain of Custody Problems |
| ☐ Missing Paperwork | ☐ Incorrect Bottle Type | ☐ Residual Chlorine Present | ☐ Other: |
| ☐ Missing/Incorrect Bottle Labels | ☐ Cooler Temperatures Out of Range | ☐ Head Space in Bottles | |

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature

6087
02.21

**Must Deliver Next Business Day
Time and Tempature Sensitive!**

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 19FEB18
ACTWGT: 1.60 LB
CAD: 300130/CAFE3108
DIMS: 14x11x10 IN

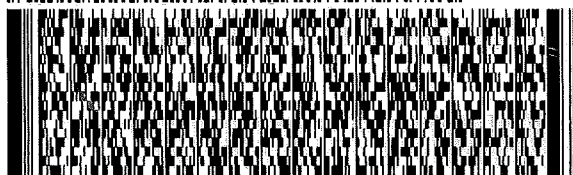
BILL SENDER

TO **KEVIN GRIFFITHS**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HSW18020913/925 - RJ



FedEx
Express



J171016102001UV

TRK# 7376 9752 6087
0201

TUE - 20 FEB 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC





Batch Worklist

Batch: ELMS/ 2053

Created: 2/22/2018 08:05

Instrument: LCMS04

HBN: 209112

File: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP



orkorder: 1804763 [ENV_LVL4]

orkorder: 1804764 [ENV_LVL4]

orkorder: 1804765 [ENV_LVL4]

orkorder: 1805239 [ENV_LVL4]

orkorder: 1805240 [ENV_LVL4]

orkorder: 1805310 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
	588562	CCV for HBN 209112 [ELMS/2053]				CCV	3		E685041C3Q	5311		2/23/2018	2/22/2018
	588563	LODV for HBN 209112 [ELMS/2053]				LODV	3		E6850.D3Q	5311		2/23/2018	2/22/2018
	588564	ICS for HBN 209112 [ELMS/2053]				ICS	3		E6850.D3Q	5311		2/23/2018	2/22/2018
	588565	LMB for HBN 209112 [ELMS/2053]				LMB	3		E6850Q413Q	5311		2/23/2018	2/22/2018
	588566	LCS for HBN 209112 [ELMS/2053]				LCS	3		E6850Q413Q	5311		2/23/2018	2/22/2018
	1804763001	LH18/24-SP650-021418				SAMPLE	3	1804763001-A	E6850Q41.3	5480	3/14/2018	3/2/2018	2/22/2018
	588567	LH18/24-SP650...(1804763001MS)				MS	3		E6850Q413Q	5311		2/23/2018	2/22/2018
	588568	LH18/24-SP65...(1804763001MSD)				MSD	3		E6850Q413Q	5311		2/23/2018	2/22/2018
	1804764001	LH18/24-SP-650_021418				SAMPLE	3	1804764001-A	E6850Q41.3	5480	3/14/2018	3/2/2018	2/22/2018
	1804765001	LH18/24-SP140_021418				SAMPLE	3	1804765001-A	E6850Q41.3	5480	3/14/2018	3/2/2018	2/22/2018
	1805239001	LHSMW02-021518				SAMPLE	3	1805239001-A	E6850Q41.3	5480	3/15/2018	2/23/2018	2/22/2018
	1805240001	17WW12-021518				SAMPLE	3	1805240001-A	E6850Q41.3	5480	3/15/2018	2/23/2018	2/22/2018
	1805310002	LH18/24-SP650_022118_AIX				SAMPLE	3	1805310002-A	E6850Q41.3	5480	3/21/2018	2/23/2018	2/22/2018
	1805310001	LH18/24-SP650_022118_BIX				SAMPLE	3	1805310001-A	E6850Q41.3	5480	3/21/2018	2/23/2018	2/22/2018
	588569	CCV for HBN 209112 [ELMS/2053]				CCV	3		E685041C3Q	5311		2/23/2018	2/22/2018
	588570	LODV for HBN 209112 [ELMS/2053]				LODV	3		E6850.D3Q	5311		2/23/2018	2/22/2018

RIGHT SOLUTIONS | RIGHT PARTNER

Page 38 of 53



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #()'s: 1804763 (001); 1804764 (001); 1804765 (001); 1805239 (001); 1805240 (001); 1805310 (001,02)

ELMS Batch/HBN ID: 2053 (209112)

Prep Date: 02/22/2018 Analysis Date: 02/22/2018 Analyst: T. Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\FEB\22\FEB18D.s

Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by **TNB**. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot DI735)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot DI735)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 38780. Dilutions of Working Standard Solution ID 32373 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 02/22/2018, sequence 22FEB18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-DOD.M Fragmentor: 160 Output Gain: 3 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
4.0	0.80
5.0	0.25
10.0	0.25
10.5	0.80
13.0	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 36749 was used for LCS 588566; Target = 5.0µg/L. ASTM type II water was used for LMB 588565.

MS/MSD: MS/MSD was performed on sample 1804763001 (Client ID: LH18/24-SP650_021418). 5.0µL of Working Standard Solution Horizon ID 36735 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Sample 1804765001 was analyzed and reported at a 1:1,000 dilution. Sample 1805310001 was re-analyzed and reported at a 1:10 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The Matrix Spike and duplicate (MS/MSD – 588567/68) failed QC acceptance criteria for percent recoveries. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The ion ratio of m/z 83 to 85 often fails at levels near the reported Detection Limit (DL). The 83/85 ion ratio failed for the Limit of Detection Verification standard (LODV1 – 588563).
- 3) Sample data can be viewed at two directories within the ALS system: \\ALS\TWS013\LCMS\LCMS04\2018\FEB\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for datafiles 22FEBD21/26.
- 5) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\209112-DOD-ALS-HSTN-LCMS4 or through \\ALS\TWS013\DATA\REVIEW\HBN#



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850 Stock AccStd 1,000ug/mL
Standard: 36733		Created By: T. Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 5/10/2017	Expires: 10/4/2018
MFG Lot: 216095148		Lab Lot: CLO4 STOCK	Usable: Yes
Part ID: IC-PER-10X-1			
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/6/2005	Expires: 11/7/2025	
MFG Lot:	Lab Lot: LAB 109	Usable: Yes	
Part ID:			
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 36734		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/10/2017		Expires: 05/10/2018	
MFG Lot: TNB: 05/10/17		Lab Lot: CLO4 INT		Usable: Yes	
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36733	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	10/04/2018



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description - 6850 QC WKG STD 100ug/L			
Standard: 36750		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/11/2017		Expires: 05/11/2018	
MFG Lot: TNB: 05/11/17		Lab Lot: CLO4 QC WRK 100.ug/L		Usable: Yes	
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36749	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/11/2018



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 36749		Created By: T. Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/11/2017		Expires: 05/11/2018	
MFG Lot: TNB: 05/11/2017		Lab Lot: CLO4 QC INT 10.ug/mL		Usable: Yes	
Part ID:					
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water	
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/6/2005	Expires: 11/7/2025	
MFG Lot:	Lab Lot: LAB 109	Usable: Yes	
Part ID:			
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748		Created By: T. Bosch	Amount: 100 mL
MFG: Ultra Scientific		Create Date: 5/11/2017	Expires: 3/31/2020
MFG Lot: CP-0860		Lab Lot: CLO4 QC STOCK	Usable: Yes
Part ID: ICC-013			
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 38780		Created By: Thomas Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 10/09/2017 01:10PM	Expires: 10/09/2018		
MFG Lot: TNB: 10/09/17		Verified By: Thomas Bosch	Usable: Yes		
Pipette ID: Not Provided		Verify Date:	Lab Lot: CLO4ISTDWRK		
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
23118	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.1 mL	02/27/2024



STANDARD REPORT

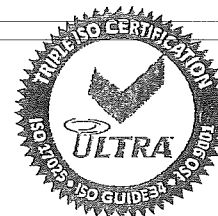
Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 23118		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 04/04/2014 03:04PM	Expires: 02/27/2024
MFG Lot: SDDG-013		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date: 02/05/2009 12:02AM	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

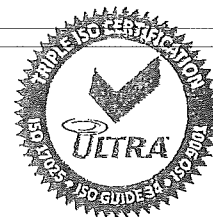
Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.





Certificate of Analysis



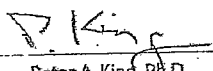
ISO Guide 34 Reference Material

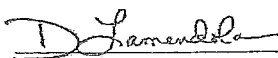
Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



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New Haven, CT 06513
USA



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Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 216095148

Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Oct 4, 2016

Expiration: Oct 4, 2018

Sample Size: 100 mL

Components: 1

Storage Condition: Ambient ($>5^\circ\text{C}$)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO Guide 34 Scope of Accreditation: Yes



Signal Word: Warning

Component		SRM #	Prepared Concentration ($\mu\text{g/mL}$)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.2\%$. See reverse side for details.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a $0.2\ \mu\text{m}$ filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be $\pm 0.5\%$ of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By:

Meigan O'Leary

Meigan O'Leary, Inorganic QC Manager



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:

ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$
 Labeled CAS Number: NA
 Unlabeled CAS Number: 7601-89-0
 MW*: 130.4
 Chemical Formula: NaClO_4
 Storage: Store at room temperature away from light and moisture.
 Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* For isotopically labeled compounds, MW listed is for the fully enriched product.

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 $\mu\text{g/mL}$
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 $\pm$ 2.8 $\mu\text{g/mL}$ (k=2)



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 31, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010584**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 32 sample(s) on Jan 12, 2018 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: Dayna.Fisher
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010584

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010584-01	17SS23A-5.0-7.0	Solid		11-Jan-2018 08:25	12-Jan-2018 09:19	☐
HS18010584-02	17SS23A-7.0-9.0	Solid		11-Jan-2018 08:26	12-Jan-2018 09:19	☐
HS18010584-04	17SS22A-5.0-7.0	Solid		11-Jan-2018 08:42	12-Jan-2018 09:19	☐
HS18010584-05	17SS22A-7.0-9.0	Solid		11-Jan-2018 08:45	12-Jan-2018 09:19	☐
HS18010584-06	17SS21A-3.0-5.0	Solid		11-Jan-2018 09:05	12-Jan-2018 09:19	☐
HS18010584-07	17SS21A-5.0-7.0	Solid		11-Jan-2018 09:06	12-Jan-2018 09:19	☐
HS18010584-08	17SS83-0.0-2.0	Solid		11-Jan-2018 09:20	12-Jan-2018 09:19	☐
HS18010584-09	17SS83-2.5-4.5	Solid		11-Jan-2018 09:22	12-Jan-2018 09:19	☐
HS18010584-10	17SS83-5.0-7.0	Solid		11-Jan-2018 09:24	12-Jan-2018 09:19	☐
HS18010584-11	17SS84-0.0-2.0	Solid		11-Jan-2018 09:32	12-Jan-2018 09:19	☐
HS18010584-12	17SS84-2.5-4.5	Solid		11-Jan-2018 09:34	12-Jan-2018 09:19	☐
HS18010584-13	17SS84-5.0-7.0	Solid		11-Jan-2018 09:36	12-Jan-2018 09:19	☐
HS18010584-14	17SS27A-2.5-4.5	Solid		11-Jan-2018 09:45	12-Jan-2018 09:19	☐
HS18010584-15	17SS27A-5.0-7.0	Solid		11-Jan-2018 09:48	12-Jan-2018 09:19	☐
HS18010584-16	17SS85-0.0-2.0	Solid		11-Jan-2018 09:57	12-Jan-2018 09:19	☐
HS18010584-17	17SS85-2.5-4.5	Solid		11-Jan-2018 09:59	12-Jan-2018 09:19	☐
HS18010584-18	17SS85-5.0-7.0	Solid		11-Jan-2018 10:01	12-Jan-2018 09:19	☐
HS18010584-19	17WW01A-2.5-4.5	Solid		11-Jan-2018 10:32	12-Jan-2018 09:19	☐
HS18010584-20	17WW01A-5.0-7.0	Solid		11-Jan-2018 10:37	12-Jan-2018 09:19	☐
HS18010584-21	17WW01A-8.0-10.0	Solid		11-Jan-2018 10:40	12-Jan-2018 09:19	☐
HS18010584-22	17SS87-0.0-2.0	Solid		11-Jan-2018 10:50	12-Jan-2018 09:19	☐
HS18010584-23	17SS87-2.5-4.5	Solid		11-Jan-2018 10:52	12-Jan-2018 09:19	☐
HS18010584-24	17SS87-5.0-7.0	Solid		11-Jan-2018 10:54	12-Jan-2018 09:19	☐
HS18010584-25	17SS86-0.0-2.0	Solid		11-Jan-2018 11:13	12-Jan-2018 09:19	☐
HS18010584-26	17SS86-2.5-4.5	Solid		11-Jan-2018 11:15	12-Jan-2018 09:19	☐
HS18010584-27	17SS86-5.0-7.0	Solid		11-Jan-2018 11:20	12-Jan-2018 09:19	☐
HS18010584-28	17SS109-0.0-2.0	Solid		11-Jan-2018 11:30	12-Jan-2018 09:19	☐

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010584

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010584-29	17SS109-2.5-4.5	Solid		11-Jan-2018 11:32	12-Jan-2018 09:19	☐
HS18010584-30	17SS109-5.0-7.0	Solid		11-Jan-2018 11:35	12-Jan-2018 09:19	☐
HS18010584-31	17SS110-0.0-2.0	Solid		11-Jan-2018 11:43	12-Jan-2018 09:19	☐
HS18010584-32	17SS110-2.5-4.5	Solid		11-Jan-2018 11:45	12-Jan-2018 09:19	☐
HS18010584-33	17SS22A-3.0-5.0	Solid		11-Jan-2018 08:40	12-Jan-2018 09:19	☐

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.**CASE NARRATIVE****Project:** Longhorn Army Ammunition Plant**Work Order:** HS18010584

HPLC by Method SW8330**Batch ID: 124385****Sample ID: 17SS87-0.0-2.0 (HS18010584-22)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Batch ID: 124384

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216**Batch ID: R309181,R309182**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS23A-5.0-7.0
 Collection Date: 11-Jan-2018 08:25

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-01
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.1	U	5.98	30.1	72.4	ug/Kg-dry	1	23-Jan-2018 00:32
2,4-Dinitrotoluene	30.1	U	5.35	30.1	72.4	ug/Kg-dry	1	23-Jan-2018 00:32
2,6-Dinitrotoluene	30.1	U	13.0	30.1	72.4	ug/Kg-dry	1	23-Jan-2018 00:32
<i>Surr: 1,2-Dinitrobenzene</i>	<i>80.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 00:32</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.1		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS23A-7.0-9.0
 Collection Date: 11-Jan-2018 08:26

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-02
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.82	29.3	70.4	ug/Kg-dry	1	23-Jan-2018 01:07
2,4-Dinitrotoluene	29.3	U	5.21	29.3	70.4	ug/Kg-dry	1	23-Jan-2018 01:07
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.4	ug/Kg-dry	1	23-Jan-2018 01:07
<i>Surr: 1,2-Dinitrobenzene</i>	<i>81.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 01:07</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS22A-5.0-7.0
 Collection Date: 11-Jan-2018 08:42

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-04
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.3	U	6.00	30.3	72.6	ug/Kg-dry	1	23-Jan-2018 01:43
2,4-Dinitrotoluene	30.3	U	5.37	30.3	72.6	ug/Kg-dry	1	23-Jan-2018 01:43
2,6-Dinitrotoluene	30.3	U	13.1	30.3	72.6	ug/Kg-dry	1	23-Jan-2018 01:43
<i>Surr: 1,2-Dinitrobenzene</i>	<i>82.5</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 01:43</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.6		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS22A-7.0-9.0
 Collection Date: 11-Jan-2018 08:45

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-05
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.80	29.2	70.1	ug/Kg-dry	1	23-Jan-2018 02:19
2,4-Dinitrotoluene	29.2	U	5.19	29.2	70.1	ug/Kg-dry	1	23-Jan-2018 02:19
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.1	ug/Kg-dry	1	23-Jan-2018 02:19
<i>Surr: 1,2-Dinitrobenzene</i>	<i>82.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 02:19</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.1		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS21A-3.0-5.0
 Collection Date: 11-Jan-2018 09:05

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-06
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	364		5.98	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 02:55
2,4-Dinitrotoluene	975		5.36	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 02:55
2,6-Dinitrotoluene	423		13.0	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 02:55
Surr: 1,2-Dinitrobenzene	85.7			0	50-150	%REC	1	23-Jan-2018 02:55
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.9		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS21A-5.0-7.0
 Collection Date: 11-Jan-2018 09:06

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-07
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.1	U	6.16	31.1	74.5	ug/Kg-dry	1	21-Jan-2018 14:29
2,4-Dinitrotoluene	31.1	U	5.52	31.1	74.5	ug/Kg-dry	1	21-Jan-2018 14:29
2,6-Dinitrotoluene	31.1	U	13.4	31.1	74.5	ug/Kg-dry	1	21-Jan-2018 14:29
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2018 14:29</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.7		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS83-0.0-2.0
 Collection Date: 11-Jan-2018 09:20

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-08
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.3	U	6.00	30.3	72.6	ug/Kg-dry	1	21-Jan-2018 15:05
2,4-Dinitrotoluene	30.3	U	5.37	30.3	72.6	ug/Kg-dry	1	21-Jan-2018 15:05
2,6-Dinitrotoluene	30.3	U	13.1	30.3	72.6	ug/Kg-dry	1	21-Jan-2018 15:05
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2018 15:05</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS83-2.5-4.5
 Collection Date: 11-Jan-2018 09:22

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-09
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.7	U	5.89	29.7	71.3	ug/Kg-dry	1	21-Jan-2018 15:41
2,4-Dinitrotoluene	29.7	U	5.27	29.7	71.3	ug/Kg-dry	1	21-Jan-2018 15:41
2,6-Dinitrotoluene	29.7	U	12.8	29.7	71.3	ug/Kg-dry	1	21-Jan-2018 15:41
<i>Surr: 1,2-Dinitrobenzene</i>	75.5			0	50-150	%REC	1	21-Jan-2018 15:41
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS83-5.0-7.0
 Collection Date: 11-Jan-2018 09:24

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-10
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.6	U	5.67	28.6	68.5	ug/Kg-dry	1	21-Jan-2018 16:16
2,4-Dinitrotoluene	28.6	U	5.07	28.6	68.5	ug/Kg-dry	1	21-Jan-2018 16:16
2,6-Dinitrotoluene	28.6	U	12.3	28.6	68.5	ug/Kg-dry	1	21-Jan-2018 16:16
<i>Surr: 1,2-Dinitrobenzene</i>	75.7			0	50-150	%REC	1	21-Jan-2018 16:16
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS84-0.0-2.0
 Collection Date: 11-Jan-2018 09:32

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-11
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	1,340		6.21	31.3	75.1	ug/Kg-dry	1	21-Jan-2018 16:52
2,4-Dinitrotoluene	3,210		5.56	31.3	75.1	ug/Kg-dry	1	21-Jan-2018 16:52
2,6-Dinitrotoluene	569		13.5	31.3	75.1	ug/Kg-dry	1	21-Jan-2018 16:52
Surr: 1,2-Dinitrobenzene	74.5			0	50-150	%REC	1	21-Jan-2018 16:52
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	21.3		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS84-2.5-4.5
 Collection Date: 11-Jan-2018 09:34

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-12
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.2	U	5.59	28.2	67.6	ug/Kg-dry	1	21-Jan-2018 17:28
2,4-Dinitrotoluene	28.2	U	5.00	28.2	67.6	ug/Kg-dry	1	21-Jan-2018 17:28
2,6-Dinitrotoluene	28.2	U	12.2	28.2	67.6	ug/Kg-dry	1	21-Jan-2018 17:28
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	21-Jan-2018 17:28
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.7		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS84-5.0-7.0
 Collection Date: 11-Jan-2018 09:36

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-13
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.6	U	5.87	29.6	71.0	ug/Kg-dry	1	21-Jan-2018 18:04
2,4-Dinitrotoluene	29.6	U	5.26	29.6	71.0	ug/Kg-dry	1	21-Jan-2018 18:04
2,6-Dinitrotoluene	29.6	U	12.8	29.6	71.0	ug/Kg-dry	1	21-Jan-2018 18:04
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.8</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2018 18:04</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS27A-2.5-4.5
 Collection Date: 11-Jan-2018 09:45

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-14
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.3	U	6.20	31.3	75.0	ug/Kg-dry	1	21-Jan-2018 19:51
2,4-Dinitrotoluene	31.3	U	5.55	31.3	75.0	ug/Kg-dry	1	21-Jan-2018 19:51
2,6-Dinitrotoluene	31.3	U	13.5	31.3	75.0	ug/Kg-dry	1	21-Jan-2018 19:51
<i>Surr: 1,2-Dinitrobenzene</i>	73.6			0	50-150	%REC	1	21-Jan-2018 19:51
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS27A-5.0-7.0
 Collection Date: 11-Jan-2018 09:48

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-15
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.82	29.3	70.4	ug/Kg-dry	1	21-Jan-2018 20:27
2,4-Dinitrotoluene	29.3	U	5.21	29.3	70.4	ug/Kg-dry	1	21-Jan-2018 20:27
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.4	ug/Kg-dry	1	21-Jan-2018 20:27
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.3</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2018 20:27</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS85-0.0-2.0
 Collection Date: 11-Jan-2018 09:57

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-16
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	254		6.88	34.7	83.2	ug/Kg-dry	1	21-Jan-2018 21:03
2,4-Dinitrotoluene	93.4		6.16	34.7	83.2	ug/Kg-dry	1	21-Jan-2018 21:03
2,6-Dinitrotoluene	34.7	U	15.0	34.7	83.2	ug/Kg-dry	1	21-Jan-2018 21:03
Surr: 1,2-Dinitrobenzene	74.0			0	50-150	%REC	1	21-Jan-2018 21:03
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	29.3		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS85-2.5-4.5
 Collection Date: 11-Jan-2018 09:59

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-17
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.1	U	5.77	29.1	69.8	ug/Kg-dry	1	21-Jan-2018 21:39
2,4-Dinitrotoluene	29.1	U	5.17	29.1	69.8	ug/Kg-dry	1	21-Jan-2018 21:39
2,6-Dinitrotoluene	29.1	U	12.6	29.1	69.8	ug/Kg-dry	1	21-Jan-2018 21:39
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	21-Jan-2018 21:39
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS85-5.0-7.0
 Collection Date: 11-Jan-2018 10:01

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-18
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.80	29.2	70.2	ug/Kg-dry	1	21-Jan-2018 22:15
2,4-Dinitrotoluene	29.2	U	5.19	29.2	70.2	ug/Kg-dry	1	21-Jan-2018 22:15
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.2	ug/Kg-dry	1	21-Jan-2018 22:15
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.5</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>21-Jan-2018 22:15</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.9		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW01A-2.5-4.5
 Collection Date: 11-Jan-2018 10:32

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-19
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.81	29.3	70.3	ug/Kg-dry	1	21-Jan-2018 22:50
2,4-Dinitrotoluene	29.3	U	5.20	29.3	70.3	ug/Kg-dry	1	21-Jan-2018 22:50
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.3	ug/Kg-dry	1	21-Jan-2018 22:50
<i>Surr: 1,2-Dinitrobenzene</i>	73.3			0	50-150	%REC	1	21-Jan-2018 22:50
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.9		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW01A-5.0-7.0
 Collection Date: 11-Jan-2018 10:37

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-20
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.5	U	5.66	28.5	68.4	ug/Kg-dry	1	21-Jan-2018 23:26
2,4-Dinitrotoluene	28.5	U	5.06	28.5	68.4	ug/Kg-dry	1	21-Jan-2018 23:26
2,6-Dinitrotoluene	28.5	U	12.3	28.5	68.4	ug/Kg-dry	1	21-Jan-2018 23:26
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	21-Jan-2018 23:26
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.1		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17WW01A-8.0-10.0
 Collection Date: 11-Jan-2018 10:40

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-21
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.0	U	5.94	30.0	71.9	ug/Kg-dry	1	22-Jan-2018 03:01
2,4-Dinitrotoluene	30.0	U	5.32	30.0	71.9	ug/Kg-dry	1	22-Jan-2018 03:01
2,6-Dinitrotoluene	30.0	U	12.9	30.0	71.9	ug/Kg-dry	1	22-Jan-2018 03:01
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	22-Jan-2018 03:01
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 10:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS87-0.0-2.0
 Collection Date: 11-Jan-2018 10:50

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-22
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	1,480,000		6360	32100	76900	ug/Kg-dry	1000	22-Jan-2018 21:32
2,4-Dinitrotoluene	33,800		56.9	321	769	ug/Kg-dry	10	22-Jan-2018 20:21
2,6-Dinitrotoluene	27,500		138	321	769	ug/Kg-dry	10	22-Jan-2018 20:21
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	1000	22-Jan-2018 21:32
Surr: 1,2-Dinitrobenzene	86.8			0	50-150	%REC	10	22-Jan-2018 20:21
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.4		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS87-2.5-4.5
 Collection Date: 11-Jan-2018 10:52

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-23
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	1,320		5.99	30.2	72.5	ug/Kg-dry	1	22-Jan-2018 04:13
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.5	ug/Kg-dry	1	22-Jan-2018 04:13
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.5	ug/Kg-dry	1	22-Jan-2018 04:13
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 04:13</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS87-5.0-7.0
 Collection Date: 11-Jan-2018 10:54

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-24
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.79	29.2	70.0	ug/Kg-dry	1	22-Jan-2018 04:49
2,4-Dinitrotoluene	29.2	U	5.18	29.2	70.0	ug/Kg-dry	1	22-Jan-2018 04:49
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.0	ug/Kg-dry	1	22-Jan-2018 04:49
<i>Surr: 1,2-Dinitrobenzene</i>	73.4			0	50-150	%REC	1	22-Jan-2018 04:49
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS86-0.0-2.0
 Collection Date: 11-Jan-2018 11:13

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-25
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	227		5.61	28.3	67.9	ug/Kg-dry	1	22-Jan-2018 05:25
2,4-Dinitrotoluene	512		5.02	28.3	67.9	ug/Kg-dry	1	22-Jan-2018 05:25
2,6-Dinitrotoluene	28.3	U	12.2	28.3	67.9	ug/Kg-dry	1	22-Jan-2018 05:25
Surr: 1,2-Dinitrobenzene	76.4			0	50-150	%REC	1	22-Jan-2018 05:25
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.4		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS86-2.5-4.5
 Collection Date: 11-Jan-2018 11:15

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-26
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.5	U	5.85	29.5	70.7	ug/Kg-dry	1	22-Jan-2018 06:01
2,4-Dinitrotoluene	29.5	U	5.23	29.5	70.7	ug/Kg-dry	1	22-Jan-2018 06:01
2,6-Dinitrotoluene	29.5	U	12.7	29.5	70.7	ug/Kg-dry	1	22-Jan-2018 06:01
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 06:01</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.6		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS86-5.0-7.0
 Collection Date: 11-Jan-2018 11:20

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-27
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.9	U	5.73	28.9	69.3	ug/Kg-dry	1	22-Jan-2018 06:36
2,4-Dinitrotoluene	28.9	U	5.13	28.9	69.3	ug/Kg-dry	1	22-Jan-2018 06:36
2,6-Dinitrotoluene	28.9	U	12.5	28.9	69.3	ug/Kg-dry	1	22-Jan-2018 06:36
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 06:36</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.1		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS109-0.0-2.0
 Collection Date: 11-Jan-2018 11:30

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-28
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.9	U	6.33	31.9	76.6	ug/Kg-dry	1	22-Jan-2018 07:12
2,4-Dinitrotoluene	31.9	U	5.67	31.9	76.6	ug/Kg-dry	1	22-Jan-2018 07:12
2,6-Dinitrotoluene	31.9	U	13.8	31.9	76.6	ug/Kg-dry	1	22-Jan-2018 07:12
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	22-Jan-2018 07:12
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	24.7		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS109-2.5-4.5
 Collection Date: 11-Jan-2018 11:32

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-29
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.6	U	5.68	28.6	68.8	ug/Kg-dry	1	22-Jan-2018 09:00
2,4-Dinitrotoluene	28.6	U	5.09	28.6	68.8	ug/Kg-dry	1	22-Jan-2018 09:00
2,6-Dinitrotoluene	28.6	U	12.4	28.6	68.8	ug/Kg-dry	1	22-Jan-2018 09:00
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 09:00</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	13.6		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS109-5.0-7.0
 Collection Date: 11-Jan-2018 11:35

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-30
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.6	U	5.88	29.6	71.1	ug/Kg-dry	1	22-Jan-2018 09:36
2,4-Dinitrotoluene	29.6	U	5.26	29.6	71.1	ug/Kg-dry	1	22-Jan-2018 09:36
2,6-Dinitrotoluene	29.6	U	12.8	29.6	71.1	ug/Kg-dry	1	22-Jan-2018 09:36
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	22-Jan-2018 09:36
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS110-0.0-2.0
 Collection Date: 11-Jan-2018 11:43

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-31
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.2	U	6.20	31.2	75.0	ug/Kg-dry	1	22-Jan-2018 10:11
2,4-Dinitrotoluene	31.2	U	5.55	31.2	75.0	ug/Kg-dry	1	22-Jan-2018 10:11
2,6-Dinitrotoluene	31.2	U	13.5	31.2	75.0	ug/Kg-dry	1	22-Jan-2018 10:11
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 10:11</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.3		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS110-2.5-4.5
 Collection Date: 11-Jan-2018 11:45

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-32
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.80	29.2	70.2	ug/Kg-dry	1	22-Jan-2018 10:47
2,4-Dinitrotoluene	29.2	U	5.19	29.2	70.2	ug/Kg-dry	1	22-Jan-2018 10:47
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.2	ug/Kg-dry	1	22-Jan-2018 10:47
<i>Surr: 1,2-Dinitrobenzene</i>	72.6			0	50-150	%REC	1	22-Jan-2018 10:47
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS22A-3.0-5.0
 Collection Date: 11-Jan-2018 08:40

ANALYTICAL REPORT

WorkOrder:HS18010584
 Lab ID:HS18010584-33
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.5	U	6.44	32.5	77.9	ug/Kg-dry	1	22-Jan-2018 11:23
2,4-Dinitrotoluene	32.5	U	5.77	32.5	77.9	ug/Kg-dry	1	22-Jan-2018 11:23
2,6-Dinitrotoluene	32.5	U	14.0	32.5	77.9	ug/Kg-dry	1	22-Jan-2018 11:23
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 11:23</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	24.5		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010584**Batch ID:** 124384 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010584-01	1	2.05	10 (mL)	4878
HS18010584-02	1	2.01	10 (mL)	4975
HS18010584-04	1	2.03	10 (mL)	4926
HS18010584-05	1	2.09	10 (mL)	4785
HS18010584-06	1	2.07	10 (mL)	4.831
HS18010584-07	1	2.03	10 (mL)	4926
HS18010584-08	1	2.01	10 (mL)	4975
HS18010584-09	1	2	10 (mL)	5000
HS18010584-10	1	2.06	10 (mL)	4854
HS18010584-11	1	2.03	10 (mL)	4.926
HS18010584-12	1	2.08	10 (mL)	4808
HS18010584-13	1	2.08	10 (mL)	4808
HS18010584-14	1	2.03	10 (mL)	4926
HS18010584-15	1	2.01	10 (mL)	4975
HS18010584-16	1	2.04	10 (mL)	4.902
HS18010584-17	1	2.07	10 (mL)	4831
HS18010584-18	1	2.01	10 (mL)	4975
HS18010584-19	1	2.03	10 (mL)	4926
HS18010584-20	1	2.09	10 (mL)	4785

Batch ID: 124385 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010584-21	1	2.03	10 (mL)	4926
HS18010584-22	1	2.01	10 (mL)	4.975
HS18010584-23	1	2	10 (mL)	5
HS18010584-24	1	2.06	10 (mL)	4854
HS18010584-25	1	2.09	10 (mL)	4.785
HS18010584-26	1	2.01	10 (mL)	4975
HS18010584-27	1	2.04	10 (mL)	4902
HS18010584-28	1	2.08	10 (mL)	4808
HS18010584-29	1	2.02	10 (mL)	4950
HS18010584-30	1	2.01	10 (mL)	4975
HS18010584-31	1	2.06	10 (mL)	4854
HS18010584-32	1	2.09	10 (mL)	4785
HS18010584-33	1	2.04	10 (mL)	4902

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124384	Test Name : EXPLOSIVES BY SW8330B			Matrix: Solid		
HS18010584-01	17SS23A-5.0-7.0	11 Jan 2018 08:25		17 Jan 2018 15:42	23 Jan 2018 00:32	1
HS18010584-02	17SS23A-7.0-9.0	11 Jan 2018 08:26		17 Jan 2018 15:42	23 Jan 2018 01:07	1
HS18010584-04	17SS22A-5.0-7.0	11 Jan 2018 08:42		17 Jan 2018 15:42	23 Jan 2018 01:43	1
HS18010584-05	17SS22A-7.0-9.0	11 Jan 2018 08:45		17 Jan 2018 15:42	23 Jan 2018 02:19	1
HS18010584-06	17SS21A-3.0-5.0	11 Jan 2018 09:05		17 Jan 2018 15:42	23 Jan 2018 02:55	1
HS18010584-07	17SS21A-5.0-7.0	11 Jan 2018 09:06		17 Jan 2018 15:42	21 Jan 2018 14:29	1
HS18010584-08	17SS83-0.0-2.0	11 Jan 2018 09:20		17 Jan 2018 15:42	21 Jan 2018 15:05	1
HS18010584-09	17SS83-2.5-4.5	11 Jan 2018 09:22		17 Jan 2018 15:42	21 Jan 2018 15:41	1
HS18010584-10	17SS83-5.0-7.0	11 Jan 2018 09:24		17 Jan 2018 15:42	21 Jan 2018 16:16	1
HS18010584-11	17SS84-0.0-2.0	11 Jan 2018 09:32		17 Jan 2018 15:42	21 Jan 2018 16:52	1
HS18010584-12	17SS84-2.5-4.5	11 Jan 2018 09:34		17 Jan 2018 15:42	21 Jan 2018 17:28	1
HS18010584-13	17SS84-5.0-7.0	11 Jan 2018 09:36		17 Jan 2018 15:42	21 Jan 2018 18:04	1
HS18010584-14	17SS27A-2.5-4.5	11 Jan 2018 09:45		17 Jan 2018 15:42	21 Jan 2018 19:51	1
HS18010584-15	17SS27A-5.0-7.0	11 Jan 2018 09:48		17 Jan 2018 15:42	21 Jan 2018 20:27	1
HS18010584-16	17SS85-0.0-2.0	11 Jan 2018 09:57		17 Jan 2018 15:42	21 Jan 2018 21:03	1
HS18010584-17	17SS85-2.5-4.5	11 Jan 2018 09:59		17 Jan 2018 15:42	21 Jan 2018 21:39	1
HS18010584-18	17SS85-5.0-7.0	11 Jan 2018 10:01		17 Jan 2018 15:42	21 Jan 2018 22:15	1
HS18010584-19	17WW01A-2.5-4.5	11 Jan 2018 10:32		17 Jan 2018 15:42	21 Jan 2018 22:50	1
HS18010584-20	17WW01A-5.0-7.0	11 Jan 2018 10:37		17 Jan 2018 15:42	21 Jan 2018 23:26	1
Batch ID 124385	Test Name : EXPLOSIVES BY SW8330B			Matrix: Solid		
HS18010584-21	17WW01A-8.0-10.0	11 Jan 2018 10:40		17 Jan 2018 15:43	22 Jan 2018 03:01	1
HS18010584-22	17SS87-0.0-2.0	11 Jan 2018 10:50		17 Jan 2018 15:43	22 Jan 2018 21:32	1000
HS18010584-22	17SS87-0.0-2.0	11 Jan 2018 10:50		17 Jan 2018 15:43	22 Jan 2018 20:21	10
HS18010584-23	17SS87-2.5-4.5	11 Jan 2018 10:52		17 Jan 2018 15:43	22 Jan 2018 04:13	1
HS18010584-24	17SS87-5.0-7.0	11 Jan 2018 10:54		17 Jan 2018 15:43	22 Jan 2018 04:49	1
HS18010584-25	17SS86-0.0-2.0	11 Jan 2018 11:13		17 Jan 2018 15:43	22 Jan 2018 05:25	1
HS18010584-26	17SS86-2.5-4.5	11 Jan 2018 11:15		17 Jan 2018 15:43	22 Jan 2018 06:01	1
HS18010584-27	17SS86-5.0-7.0	11 Jan 2018 11:20		17 Jan 2018 15:43	22 Jan 2018 06:36	1
HS18010584-28	17SS109-0.0-2.0	11 Jan 2018 11:30		17 Jan 2018 15:43	22 Jan 2018 07:12	1
HS18010584-29	17SS109-2.5-4.5	11 Jan 2018 11:32		17 Jan 2018 15:43	22 Jan 2018 09:00	1
HS18010584-30	17SS109-5.0-7.0	11 Jan 2018 11:35		17 Jan 2018 15:43	22 Jan 2018 09:36	1
HS18010584-31	17SS110-0.0-2.0	11 Jan 2018 11:43		17 Jan 2018 15:43	22 Jan 2018 10:11	1
HS18010584-32	17SS110-2.5-4.5	11 Jan 2018 11:45		17 Jan 2018 15:43	22 Jan 2018 10:47	1
HS18010584-33	17SS22A-3.0-5.0	11 Jan 2018 08:40		17 Jan 2018 15:43	22 Jan 2018 11:23	1

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R309181	Test Name : MOISTURE - ASTM D2216			Matrix: Solid		
HS18010584-01	17SS23A-5.0-7.0	11 Jan 2018 08:25			18 Jan 2018 10:40	1
HS18010584-02	17SS23A-7.0-9.0	11 Jan 2018 08:26			18 Jan 2018 10:40	1
HS18010584-04	17SS22A-5.0-7.0	11 Jan 2018 08:42			18 Jan 2018 10:40	1
HS18010584-05	17SS22A-7.0-9.0	11 Jan 2018 08:45			18 Jan 2018 10:40	1
HS18010584-06	17SS21A-3.0-5.0	11 Jan 2018 09:05			18 Jan 2018 10:40	1
HS18010584-07	17SS21A-5.0-7.0	11 Jan 2018 09:06			18 Jan 2018 10:40	1
HS18010584-08	17SS83-0.0-2.0	11 Jan 2018 09:20			18 Jan 2018 10:40	1
HS18010584-09	17SS83-2.5-4.5	11 Jan 2018 09:22			18 Jan 2018 10:40	1
HS18010584-10	17SS83-5.0-7.0	11 Jan 2018 09:24			18 Jan 2018 10:40	1
HS18010584-11	17SS84-0.0-2.0	11 Jan 2018 09:32			18 Jan 2018 10:40	1
HS18010584-12	17SS84-2.5-4.5	11 Jan 2018 09:34			18 Jan 2018 10:40	1
HS18010584-13	17SS84-5.0-7.0	11 Jan 2018 09:36			18 Jan 2018 10:40	1
HS18010584-14	17SS27A-2.5-4.5	11 Jan 2018 09:45			18 Jan 2018 10:40	1
HS18010584-15	17SS27A-5.0-7.0	11 Jan 2018 09:48			18 Jan 2018 10:40	1
HS18010584-16	17SS85-0.0-2.0	11 Jan 2018 09:57			18 Jan 2018 10:40	1
HS18010584-17	17SS85-2.5-4.5	11 Jan 2018 09:59			18 Jan 2018 10:40	1
HS18010584-18	17SS85-5.0-7.0	11 Jan 2018 10:01			18 Jan 2018 10:40	1
HS18010584-19	17WW01A-2.5-4.5	11 Jan 2018 10:32			18 Jan 2018 10:40	1
HS18010584-20	17WW01A-5.0-7.0	11 Jan 2018 10:37			18 Jan 2018 10:40	1
HS18010584-21	17WW01A-8.0-10.0	11 Jan 2018 10:40			18 Jan 2018 10:40	1
Batch ID R309182	Test Name : MOISTURE - ASTM D2216			Matrix: Solid		
HS18010584-22	17SS87-0.0-2.0	11 Jan 2018 10:50			18 Jan 2018 11:05	1
HS18010584-23	17SS87-2.5-4.5	11 Jan 2018 10:52			18 Jan 2018 11:05	1
HS18010584-24	17SS87-5.0-7.0	11 Jan 2018 10:54			18 Jan 2018 11:05	1
HS18010584-25	17SS86-0.0-2.0	11 Jan 2018 11:13			18 Jan 2018 11:05	1
HS18010584-26	17SS86-2.5-4.5	11 Jan 2018 11:15			18 Jan 2018 11:05	1
HS18010584-27	17SS86-5.0-7.0	11 Jan 2018 11:20			18 Jan 2018 11:05	1
HS18010584-28	17SS109-0.0-2.0	11 Jan 2018 11:30			18 Jan 2018 11:05	1
HS18010584-29	17SS109-2.5-4.5	11 Jan 2018 11:32			18 Jan 2018 11:05	1
HS18010584-30	17SS109-5.0-7.0	11 Jan 2018 11:35			18 Jan 2018 11:05	1
HS18010584-31	17SS110-0.0-2.0	11 Jan 2018 11:43			18 Jan 2018 11:05	1
HS18010584-32	17SS110-2.5-4.5	11 Jan 2018 11:45			18 Jan 2018 11:05	1
HS18010584-33	17SS22A-3.0-5.0	11 Jan 2018 08:40			18 Jan 2018 11:05	1

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

QC BATCH REPORT

Batch ID: 124384		Instrument: HPLC3		Method: SW8330						
MBLK	Sample ID: MBLK-124384	Units: ug/Kg			Analysis Date: 22-Jan-2018 23:20					
Client ID:	Run ID: HPLC3_309353	SeqNo: 4401080		PrepDate: 17-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

2,4,6-Trinitrotoluene	25.0	60.0								U
2,4-Dinitrotoluene	25.0	60.0								U
2,6-Dinitrotoluene	25.0	60.0								U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>992.3</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>79.4</i>	<i>50 - 150</i>				

LCS	Sample ID: LCS-124384	Units: ug/Kg			Analysis Date: 22-Jan-2018 23:56					
Client ID:		Run ID: HPLC3_309353	SeqNo: 4401081		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

2,4,6-Trinitrotoluene	1303	60.0	1250	0	104	75 - 125				
2,4-Dinitrotoluene	1295	60.0	1250	0	104	82 - 123				
2,6-Dinitrotoluene	1277	60.0	1250	0	102	86 - 119				
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1234</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>98.7</i>	<i>50 - 150</i>				

MS	Sample ID: HS18010607-02MS			Units: ug/Kg		Analysis Date: 23-Jan-2018 04:07			
Client ID:	Run ID: HPLC3_309353			SeqNo: 4401411		PrepDate: 17-Jan-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

2,4,6-Trinitrotoluene	1371	59.7	1244	0	110	75 - 125				
2,4-Dinitrotoluene	1343	59.7	1244	0	108	82 - 123				
2,6-Dinitrotoluene	1326	59.7	1244	0	107	86 - 119				
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1050</i>	<i>59.7</i>	<i>1244</i>	<i>0</i>	<i>84.4</i>	<i>50 - 150</i>				

MSD	Sample ID: HS18010607-02MSD			Units: ug/Kg		Analysis Date: 23-Jan-2018 04:43			
Client ID:	Run ID: HPLC3_309353			SeqNo: 4401412		PrepDate: 17-Jan-2018		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

2,4,6-Trinitrotoluene	1393	59.4	1238	0	113	75 - 125	1371	1.61	30	
2,4-Dinitrotoluene	1354	59.4	1238	0	109	82 - 123	1343	0.789	30	
2,6-Dinitrotoluene	1339	59.4	1238	0	108	86 - 119	1326	0.96	30	
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1065</i>	<i>59.4</i>	<i>1238</i>	<i>0</i>	<i>86.1</i>	<i>50 - 150</i>	<i>1050</i>	<i>1.44</i>	<i>30</i>	

The following samples were analyzed in this batch:										
HS18010584-01	HS18010584-02	HS18010584-04	HS18010584-05							
HS18010584-06	HS18010584-07	HS18010584-08	HS18010584-09							
HS18010584-10	HS18010584-11	HS18010584-12	HS18010584-13							
HS18010584-14	HS18010584-15	HS18010584-16	HS18010584-17							
HS18010584-18	HS18010584-19	HS18010584-20								

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

QC BATCH REPORT

Batch ID: 124385		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124385	Units: ug/Kg		Analysis Date: 22-Jan-2018 01:50					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400219		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>917.2</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.4</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124385	Units: ug/Kg		Analysis Date: 22-Jan-2018 02:26					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400220		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1234	60.0	1250	0	98.7	75 - 125			
2,4-Dinitrotoluene	1226	60.0	1250	0	98.1	82 - 123			
2,6-Dinitrotoluene	1209	60.0	1250	0	96.8	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1167</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>93.4</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-04MS	Units: ug/Kg		Analysis Date: 22-Jan-2018 16:10					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400240		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1210	59.1	1232	0	98.3	75 - 125			
2,4-Dinitrotoluene	1213	59.1	1232	0	98.5	82 - 123			
2,6-Dinitrotoluene	1183	59.1	1232	0	96.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>917.9</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>74.5</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-03MS	Units: ug/Kg		Analysis Date: 22-Jan-2018 13:11					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400235		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1166	58.0	1208	0	96.6	75 - 125			
2,4-Dinitrotoluene	1158	58.0	1208	0	95.9	82 - 123			
2,6-Dinitrotoluene	1137	58.0	1208	0	94.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>909.8</i>	<i>58.0</i>	<i>1208</i>	<i>0</i>	<i>75.3</i>	<i>50 - 150</i>			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

QC BATCH REPORT

Batch ID: 124385		Instrument: HPLC3		Method: SW8330					
MSD	Sample ID: HS18010607-04MSD	Units: ug/Kg		Analysis Date: 22-Jan-2018 16:46					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400241		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1237	59.7	1244	0	99.4	75 - 125	1210	2.18	30
2,4-Dinitrotoluene	1230	59.7	1244	0	98.9	82 - 123	1213	1.45	30
2,6-Dinitrotoluene	1206	59.7	1244	0	96.9	86 - 119	1183	1.9	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>919.3</i>	<i>59.7</i>	<i>1244</i>	<i>0</i>	<i>73.9</i>	<i>50 - 150</i>	<i>917.9</i>	<i>0.151</i>	<i>30</i>

MSD	Sample ID: HS18010607-03MSD	Units: ug/Kg		Analysis Date: 22-Jan-2018 13:46					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400236		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1167	58.5	1220	0	95.7	75 - 125	1166	0.0821	30
2,4-Dinitrotoluene	1169	58.5	1220	0	95.9	82 - 123	1158	0.971	30
2,6-Dinitrotoluene	1150	58.5	1220	0	94.3	86 - 119	1137	1.18	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>913.8</i>	<i>58.5</i>	<i>1220</i>	<i>0</i>	<i>74.9</i>	<i>50 - 150</i>	<i>909.8</i>	<i>0.438</i>	<i>30</i>

The following samples were analyzed in this batch:

HS18010584-21	HS18010584-22	HS18010584-23	HS18010584-24
HS18010584-25	HS18010584-26	HS18010584-27	HS18010584-28
HS18010584-29	HS18010584-30	HS18010584-31	HS18010584-32
HS18010584-33			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010584

QC BATCH REPORT

Batch ID: R309181		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010584-21DUP	Units: wt%		Analysis Date: 18-Jan-2018 10:40	
Client ID: 17WW01A-8.0-10.0	Run ID: Balance1_309181	SeqNo: 4397342		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	17.4	0.0100			17.8 2.27 20

The following samples were analyzed in this batch:

HS18010584-01	HS18010584-02	HS18010584-04	HS18010584-05
HS18010584-06	HS18010584-07	HS18010584-08	HS18010584-09
HS18010584-10	HS18010584-11	HS18010584-12	HS18010584-13
HS18010584-14	HS18010584-15	HS18010584-16	HS18010584-17
HS18010584-18	HS18010584-19	HS18010584-20	HS18010584-21

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

QC BATCH REPORT

Batch ID: R309182		Instrument: Balance1		Method: ASTM D2216					
DUP	Sample ID: HS18010607-04DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:05					
Client ID:	Run ID: Balance1_309182	SeqNo: 4397365		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	14.8	0.0100					15.4	3.97	20
DUP	Sample ID: HS18010607-03DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:05					
Client ID:	Run ID: Balance1_309182	SeqNo: 4397364		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	13.5	0.0100					14.6	7.83	20
DUP	Sample ID: HS18010607-02DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:05					
Client ID:	Run ID: Balance1_309182	SeqNo: 4397363		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	19.9	0.0100					20.3	1.99	20
The following samples were analyzed in this batch:				HS18010584-22	HS18010584-23	HS18010584-24	HS18010584-25		
				HS18010584-26	HS18010584-27	HS18010584-28	HS18010584-29		
				HS18010584-30	HS18010584-31	HS18010584-32	HS18010584-33		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010584

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group USA, Corp

Date: 31-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010584

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18010584-01	17SS23A-5.0-7.0	Login	1/15/2018 4:49:42 PM	LFH	SPA266
HS18010584-02	17SS23A-7.0-9.0	Login	1/15/2018 4:49:42 PM	LFH	SPA266
HS18010584-04	17SS22A-5.0-7.0	Login	1/15/2018 4:49:43 PM	LFH	SPA266
HS18010584-05	17SS22A-7.0-9.0	Login	1/15/2018 4:49:43 PM	LFH	SPA266
HS18010584-06	17SS21A-3.0-5.0	Login	1/15/2018 4:49:43 PM	LFH	SPA266
HS18010584-07	17SS21A-5.0-7.0	Login	1/15/2018 4:49:43 PM	LFH	SPA266
HS18010584-08	17SS83-0.0-2.0	Login	1/15/2018 4:49:44 PM	LFH	SPA266
HS18010584-09	17SS83-2.5-4.5	Login	1/15/2018 4:49:44 PM	LFH	SPA266
HS18010584-10	17SS83-5.0-7.0	Login	1/15/2018 4:49:44 PM	LFH	SPA266
HS18010584-11	17SS84-0.0-2.0	Login	1/15/2018 4:49:44 PM	LFH	SPA266
HS18010584-12	17SS84-2.5-4.5	Login	1/15/2018 4:49:45 PM	LFH	SPA266
HS18010584-13	17SS84-5.0-7.0	Login	1/15/2018 4:49:45 PM	LFH	SPA266
HS18010584-14	17SS27A-2.5-4.5	Login	1/15/2018 4:49:45 PM	LFH	SPA266
HS18010584-15	17SS27A-5.0-7.0	Login	1/15/2018 4:49:46 PM	LFH	SPA266
HS18010584-16	17SS85-0.0-2.0	Login	1/15/2018 4:49:46 PM	LFH	SPA266
HS18010584-17	17SS85-2.5-4.5	Login	1/15/2018 4:49:46 PM	LFH	SPA266
HS18010584-18	17SS85-5.0-7.0	Login	1/15/2018 4:49:46 PM	LFH	SPA266
HS18010584-19	17WW01A-2.5-4.5	Login	1/15/2018 4:49:47 PM	LFH	SPA266
HS18010584-20	17WW01A-5.0-7.0	Login	1/15/2018 4:49:47 PM	LFH	SPA266
HS18010584-21	17WW01A-8.0-10.0	Login	1/15/2018 4:49:47 PM	LFH	SPA266
HS18010584-22	17SS87-0.0-2.0	Login	1/15/2018 4:49:47 PM	LFH	SPA266
HS18010584-23	17SS87-2.5-4.5	Login	1/15/2018 4:49:48 PM	LFH	SPA266
HS18010584-24	17SS87-5.0-7.0	Login	1/15/2018 4:49:48 PM	LFH	SPA267
HS18010584-25	17SS86-0.0-2.0	Login	1/15/2018 4:49:48 PM	LFH	SPA267
HS18010584-26	17SS86-2.5-4.5	Login	1/15/2018 4:49:48 PM	LFH	SPA267
HS18010584-27	17SS86-5.0-7.0	Login	1/15/2018 4:49:49 PM	LFH	SPA267
HS18010584-28	17SS109-0.0-2.0	Login	1/15/2018 4:49:49 PM	LFH	SPA267
HS18010584-29	17SS109-2.5-4.5	Login	1/15/2018 4:49:49 PM	LFH	SPA267
HS18010584-30	17SS109-5.0-7.0	Login	1/15/2018 4:49:50 PM	LFH	SPA267
HS18010584-31	17SS110-0.0-2.0	Login	1/15/2018 4:49:50 PM	LFH	SPA267
HS18010584-32	17SS110-2.5-4.5	Login	1/15/2018 4:49:50 PM	LFH	SPA267
HS18010584-33	17SS22A-3.0-5.0	Login	1/17/2018 2:09:35 PM	LFH	SPA267

ALS Group USA, Corp

Date: 31-Jan-18

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS18010584

Date/Time Received: **12-Jan-2018 09:19**
 Received by: **CL**

Checklist completed by: Pablo Martinez 15-Jan-2018
 eSignature Date

Reviewed by: RJ Modashia 17-Jan-2018
 eSignature Date

Matrices: **SOIL**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.8C/1.1C, 0.3C/0.6C UC/C IR # 30

Cooler(s)/Kit(s): 25401, 42769

Date/Time sample(s) sent to storage: 1/15/2018 19:00

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:

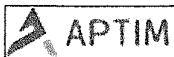
Login Notes: Sample ID differs: COC = 1SS22A-3.0-5.0, sample container = 17SS22A-3.0-5.0.

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



COC ID: 17-JAN2018-SO-ALSHT-011118		TURNAROUND TIME: normal		RUSH:							
PROJECT/CLIENT INFO											
Facility Name	Longhorn AAP		Lab Name	ALS Laboratories							
Project Number	501032		Lab Contact	Sonia West							
	LHAAP-17		Email	Sonia.West@alsglobal.com							
Address	1203-B East Grand Avenue		Address	10450 Stancliff Rd., Suite 210							
	PMB 202			Address 2410 Cherahala Blvd.							
City	Marshall	State	TX	City	Knoxville						
Postal Code	75670	Country	USA	Postal Code	37932						
Phone Number	713.243.7264		Phone Number	281.575.2132 or 281.530.5656							
Project Manager	Praveen Srivastav			Shipping Company FedEx							
SAMPLE DETAILS											
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330	HS18010584 Aptim Environmental & Infrastructure, Inc. Longhorn Army Ammunition Plant	
17SS23A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	0825	1	X		
17SS23A-7.0-9.0	LHAAP-17	7	9	FT	SO	1/11/2018	0826	1	X		
1SS22A-3.0-5.0	LHAAP-17	3	5	FT	SO	1/11/2018	0840	1	X		
17SS22A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	0842	1	X		
17SS22A-7.0-9.0	LHAAP-17	7	9	FT	SO	1/11/2018	0845	1	X		
17SS21A-3.0-5.0	LHAAP-17	3	5	FT	SO	1/11/2018	0905	1	X		
17SS21A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	0906	1	X		
17SS83-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	0920	1	X		
17SS83-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	0922	1	X		
17SS83-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	0924	1	X		
17SS84-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	0932	1	X		
17SS84-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	0934	1	X		
17SS84-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	0936	1	X		
17SS27A-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	0945	1	X		
17SS27A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	0948	1	X		
17SS85-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	0957	1	X		
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS						RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION	
25401 42769 0.8 0.3 in 30 OFC 0.3						DANIEL ROWAN / APTIM		1/11/18		-ALSTH	

COC ID: 17-JAN-SO-ALSHT-011118		TURNAROUND TIME: normal		RUSH:	
PROJECT/CLIENT INFO				LABORATORY	
Facility Name Longhorn AAP		Lab Name ALS Laboratories		Email Invoice To FedInvoices@CBIFederalServices.com	
Project Number 501032		Lab Contact Sonia West		Email Report To Sharon.Pennington@CBIFederalServices.com	
Address LHAAP-17		Email Sonia.West@alsglobal.com		Mail Reports To Sharon Pennington	
Address 1203-B East Grand Avenue		Address 10450 Stancil Rd., Suite 210		Address 2410 Cherahala Blvd.	
PMB 202		City Houston State TX		City Knoxville State TN	
City Marshall State TX		Postal Code 77099 Country USA		Postal Code 37932 Country USA	
Postal Code 75670		Phone Number 281.575.2132 or 281.530.5656		Shipping Company FedEx	
Phone Number 713.243.7264					
Project Manager Praveen Srivastav					

SAMPLE DETAILS									ANALYSIS REQUESTED	
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	
17SS85-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	0959	1	2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330	X
17SS85-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1001	1		X
17WW01A-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1032	1		X
17WW01A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1037	1		X
17WW01A-8.0-10.0	LHAAP-17	8	10	FT	SO	1/11/2018	1040	1		X
17SS87-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1050	1		X
17SS87-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1052	1		X
17SS87-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1054	1		X
17SS86-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1113	1		X
17SS86-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1115	1		X
17SS86-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1120	1		X
17SS109-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1130	1		X
17SS109-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1132	1		X
17SS109-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1135	1		X
17SS110-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1143	1		X
17SS110-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1145	1		X

HS18010584

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant



ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS	RELINQUISHED BY/AFFILIATION	DATE/TIME	ACCEPTED BY/AFFILIATION	DATE/TIME
	DAVID ROWAN / APTIM	1/11/18		1-12-18 0219

CUSTODY SEAL

DATE: 1-11-18

Signature: DR

LHAAP

25401

FedEx
TRK# 7376 9749 7374
0221FRI - 12 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

TO

1-8

U

FedEx

TRK# 7376 9749 7374
0221

AB SGRA



42769



10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 10, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010586**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 32 sample(s) on Jan 15, 2018 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: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010586

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010586-01	17SB02A-11.0-13.0	Soil		12-Jan-2018 08:15	15-Jan-2018 09:15	☐
HS18010586-02	17SB02A-11.0-13.0-FD	Soil		12-Jan-2018 08:15	15-Jan-2018 09:15	☐
HS18010586-03	17SB02A-13.0-15.0	Soil		12-Jan-2018 08:17	15-Jan-2018 09:15	☐
HS18010586-04	17SB02A-13.0-15.0-FD	Soil		12-Jan-2018 08:17	15-Jan-2018 09:15	☐
HS18010586-05	17SS116-0.0-2.0	Soil		12-Jan-2018 08:27	15-Jan-2018 09:15	☐
HS18010586-06	17SS116-2.5-4.5	Soil		12-Jan-2018 08:28	15-Jan-2018 09:15	☐
HS18010586-07	17SS116-5.0-7.0	Soil		12-Jan-2018 08:30	15-Jan-2018 09:15	☐
HS18010586-08	17SS117-0.0-2.0	Soil		12-Jan-2018 08:39	15-Jan-2018 09:15	☐
HS18010586-09	17SS117-2.5-4.5	Soil		12-Jan-2018 08:40	15-Jan-2018 09:15	☐
HS18010586-10	17SS117-5.0-7.0	Soil		12-Jan-2018 08:42	15-Jan-2018 09:15	☐
HS18010586-11	17SS117-0.0-2.0-FD	Soil		12-Jan-2018 08:39	15-Jan-2018 09:15	☐
HS18010586-12	17SS117-2.5-4.5-FD	Soil		12-Jan-2018 08:40	15-Jan-2018 09:15	☐
HS18010586-13	17SS118-0.0-2.0	Soil		12-Jan-2018 08:50	15-Jan-2018 09:15	☐
HS18010586-14	17SS118-2.5-4.5	Soil		12-Jan-2018 08:51	15-Jan-2018 09:15	☐
HS18010586-15	17SS118-5.0-7.0	Soil		12-Jan-2018 08:54	15-Jan-2018 09:15	☐
HS18010586-16	17SS119-0.0-2.0	Soil		12-Jan-2018 09:02	15-Jan-2018 09:15	☐
HS18010586-17	17SS119-2.5-4.5	Soil		12-Jan-2018 09:03	15-Jan-2018 09:15	☐
HS18010586-18	17SS119-5.0-7.0	Soil		12-Jan-2018 09:05	15-Jan-2018 09:15	☐
HS18010586-19	17SS124-0.0-2.0	Soil		12-Jan-2018 09:13	15-Jan-2018 09:15	☐
HS18010586-20	17SS124-2.5-4.5	Soil		12-Jan-2018 09:15	15-Jan-2018 09:15	☐
HS18010586-21	17SS124-5.0-7.0	Soil		12-Jan-2018 09:17	15-Jan-2018 09:15	☐
HS18010586-22	17SS124-0.0-2.0-FD	Soil		12-Jan-2018 09:13	15-Jan-2018 09:15	☐
HS18010586-23	17SS124-2.5-4.5-FD	Soil		12-Jan-2018 09:15	15-Jan-2018 09:15	☐
HS18010586-24	17SS124-5.0-7.0-FD	Soil		12-Jan-2018 09:17	15-Jan-2018 09:15	☐
HS18010586-25	17SS123-0.0-2.0	Soil		12-Jan-2018 09:26	15-Jan-2018 09:15	☐
HS18010586-26	17SS123-2.5-4.5	Soil		12-Jan-2018 09:28	15-Jan-2018 09:15	☐
HS18010586-27	17SS123-5.0-7.0	Soil		12-Jan-2018 09:30	15-Jan-2018 09:15	☐

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010586

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010586-28	17SS122-0.0-2.0	Soil		12-Jan-2018 09:36	15-Jan-2018 09:15	☐
HS18010586-29	17SS122-2.5-4.5	Soil		12-Jan-2018 09:38	15-Jan-2018 09:15	☐
HS18010586-30	17SS122-5.0-7.0	Soil		12-Jan-2018 09:40	15-Jan-2018 09:15	☐
HS18010586-31	17SS121-0.0-2.0	Soil		12-Jan-2018 09:46	15-Jan-2018 09:15	☐
HS18010586-32	17SS121-2.5-4.5	Soil		12-Jan-2018 09:48	15-Jan-2018 09:15	☐

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010586

CASE NARRATIVE

HPLC by Method SW8330**Batch ID: 124400,124401,124491**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216**Batch ID: R309436,R309437**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB02A-11.0-13.0
 Collection Date: 12-Jan-2018 08:15

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	5.98	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 07:42
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 07:42
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 07:42
<i>Surr: 1,2-Dinitrobenzene</i>	<i>83.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 07:42</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	17.5		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB02A-11.0-13.0-FD
 Collection Date: 12-Jan-2018 08:15

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.79	29.2	70.0	ug/Kg-dry	1	23-Jan-2018 08:18
2,4-Dinitrotoluene	29.2	U	5.18	29.2	70.0	ug/Kg-dry	1	23-Jan-2018 08:18
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.0	ug/Kg-dry	1	23-Jan-2018 08:18
<i>Surr: 1,2-Dinitrobenzene</i>	<i>83.8</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 08:18</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	18.0		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB02A-13.0-15.0
 Collection Date: 12-Jan-2018 08:17

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-03
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.1	U	6.16	31.1	74.5	ug/Kg-dry	1	23-Jan-2018 08:54
2,4-Dinitrotoluene	31.1	U	5.52	31.1	74.5	ug/Kg-dry	1	23-Jan-2018 08:54
2,6-Dinitrotoluene	31.1	U	13.4	31.1	74.5	ug/Kg-dry	1	23-Jan-2018 08:54
<i>Surr: 1,2-Dinitrobenzene</i>	83.3			0	50-150	%REC	1	23-Jan-2018 08:54
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.6		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB02A-13.0-15.0-FD
 Collection Date: 12-Jan-2018 08:17

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-04
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.9	U	6.13	30.9	74.2	ug/Kg-dry	1	24-Jan-2018 04:40
2,4-Dinitrotoluene	30.9	U	5.49	30.9	74.2	ug/Kg-dry	1	24-Jan-2018 04:40
2,6-Dinitrotoluene	30.9	U	13.4	30.9	74.2	ug/Kg-dry	1	24-Jan-2018 04:40
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 04:40</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.3		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS116-0.0-2.0
 Collection Date: 12-Jan-2018 08:27

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-05
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.8	U	6.31	31.8	76.4	ug/Kg-dry	1	24-Jan-2018 05:16
2,4-Dinitrotoluene	31.8	U	5.65	31.8	76.4	ug/Kg-dry	1	24-Jan-2018 05:16
2,6-Dinitrotoluene	31.8	U	13.7	31.8	76.4	ug/Kg-dry	1	24-Jan-2018 05:16
<i>Surr: 1,2-Dinitrobenzene</i>	72.5			0	50-150	%REC	1	24-Jan-2018 05:16
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.2		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS116-2.5-4.5
 Collection Date: 12-Jan-2018 08:28

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-06
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.2	U	5.60	28.2	67.7	ug/Kg-dry	1	24-Jan-2018 05:52
2,4-Dinitrotoluene	28.2	U	5.01	28.2	67.7	ug/Kg-dry	1	24-Jan-2018 05:52
2,6-Dinitrotoluene	28.2	U	12.2	28.2	67.7	ug/Kg-dry	1	24-Jan-2018 05:52
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 05:52</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	12.3		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS116-5.0-7.0
 Collection Date: 12-Jan-2018 08:30

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-07
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.1	U	5.57	28.1	67.4	ug/Kg-dry	1	24-Jan-2018 06:28
2,4-Dinitrotoluene	28.1	U	4.99	28.1	67.4	ug/Kg-dry	1	24-Jan-2018 06:28
2,6-Dinitrotoluene	28.1	U	12.1	28.1	67.4	ug/Kg-dry	1	24-Jan-2018 06:28
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	24-Jan-2018 06:28
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	12.7		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS117-0.0-2.0
 Collection Date: 12-Jan-2018 08:39

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-08
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.8	U	6.11	30.8	73.9	ug/Kg-dry	1	24-Jan-2018 07:04
2,4-Dinitrotoluene	30.8	U	5.47	30.8	73.9	ug/Kg-dry	1	24-Jan-2018 07:04
2,6-Dinitrotoluene	30.8	U	13.3	30.8	73.9	ug/Kg-dry	1	24-Jan-2018 07:04
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 07:04</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.2		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS117-2.5-4.5
 Collection Date: 12-Jan-2018 08:40

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-09
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.0	U	5.75	29.0	69.5	ug/Kg-dry	1	24-Jan-2018 07:40
2,4-Dinitrotoluene	29.0	U	5.14	29.0	69.5	ug/Kg-dry	1	24-Jan-2018 07:40
2,6-Dinitrotoluene	29.0	U	12.5	29.0	69.5	ug/Kg-dry	1	24-Jan-2018 07:40
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 07:40</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	15.8		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS117-5.0-7.0
 Collection Date: 12-Jan-2018 08:42

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-10
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.8	U	5.71	28.8	69.0	ug/Kg-dry	1	24-Jan-2018 08:15
2,4-Dinitrotoluene	28.8	U	5.11	28.8	69.0	ug/Kg-dry	1	24-Jan-2018 08:15
2,6-Dinitrotoluene	28.8	U	12.4	28.8	69.0	ug/Kg-dry	1	24-Jan-2018 08:15
<i>Surr: 1,2-Dinitrobenzene</i>	73.3			0	50-150	%REC	1	24-Jan-2018 08:15
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.0		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS117-0.0-2.0-FD
 Collection Date: 12-Jan-2018 08:39

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-11
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.3	U	6.02	30.3	72.8	ug/Kg-dry	1	24-Jan-2018 08:51
2,4-Dinitrotoluene	30.3	U	5.39	30.3	72.8	ug/Kg-dry	1	24-Jan-2018 08:51
2,6-Dinitrotoluene	30.3	U	13.1	30.3	72.8	ug/Kg-dry	1	24-Jan-2018 08:51
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 08:51</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	18.0		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS117-2.5-4.5-FD
 Collection Date: 12-Jan-2018 08:40

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-12
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.1	U	5.97	30.1	72.2	ug/Kg-dry	1	24-Jan-2018 10:39
2,4-Dinitrotoluene	30.1	U	5.34	30.1	72.2	ug/Kg-dry	1	24-Jan-2018 10:39
2,6-Dinitrotoluene	30.1	U	13.0	30.1	72.2	ug/Kg-dry	1	24-Jan-2018 10:39
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	24-Jan-2018 10:39
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.9		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS118-0.0-2.0
 Collection Date: 12-Jan-2018 08:50

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-13
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	34.4	U	6.82	34.4	82.6	ug/Kg-dry	1	24-Jan-2018 11:15
2,4-Dinitrotoluene	34.4	U	6.11	34.4	82.6	ug/Kg-dry	1	24-Jan-2018 11:15
2,6-Dinitrotoluene	34.4	U	14.9	34.4	82.6	ug/Kg-dry	1	24-Jan-2018 11:15
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 11:15</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	28.4		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS118-2.5-4.5
 Collection Date: 12-Jan-2018 08:51

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-14
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.9	U	5.92	29.9	71.7	ug/Kg-dry	1	24-Jan-2018 11:50
2,4-Dinitrotoluene	29.9	U	5.30	29.9	71.7	ug/Kg-dry	1	24-Jan-2018 11:50
2,6-Dinitrotoluene	29.9	U	12.9	29.9	71.7	ug/Kg-dry	1	24-Jan-2018 11:50
<i>Surr: 1,2-Dinitrobenzene</i>	73.8			0	50-150	%REC	1	24-Jan-2018 11:50
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.1		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS118-5.0-7.0
 Collection Date: 12-Jan-2018 08:54

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-15
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.8	U	5.71	28.8	69.1	ug/Kg-dry	1	24-Jan-2018 12:26
2,4-Dinitrotoluene	28.8	U	5.11	28.8	69.1	ug/Kg-dry	1	24-Jan-2018 12:26
2,6-Dinitrotoluene	28.8	U	12.4	28.8	69.1	ug/Kg-dry	1	24-Jan-2018 12:26
<i>Surr: 1,2-Dinitrobenzene</i>	71.9			0	50-150	%REC	1	24-Jan-2018 12:26
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.4		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS119-0.0-2.0
 Collection Date: 12-Jan-2018 09:02

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-16
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.9	U	5.93	29.9	71.7	ug/Kg-dry	1	24-Jan-2018 13:02
2,4-Dinitrotoluene	29.9	U	5.31	29.9	71.7	ug/Kg-dry	1	24-Jan-2018 13:02
2,6-Dinitrotoluene	29.9	U	12.9	29.9	71.7	ug/Kg-dry	1	24-Jan-2018 13:02
<i>Surr: 1,2-Dinitrobenzene</i>	72.6			0	50-150	%REC	1	24-Jan-2018 13:02
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.4		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS119-2.5-4.5
 Collection Date: 12-Jan-2018 09:03

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-17
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	5.98	30.2	72.4	ug/Kg-dry	1	24-Jan-2018 13:38
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.4	ug/Kg-dry	1	24-Jan-2018 13:38
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.4	ug/Kg-dry	1	24-Jan-2018 13:38
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	24-Jan-2018 13:38
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	19.9		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS119-5.0-7.0
 Collection Date: 12-Jan-2018 09:05

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-18
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.6	U	5.67	28.6	68.5	ug/Kg-dry	1	24-Jan-2018 14:14
2,4-Dinitrotoluene	28.6	U	5.07	28.6	68.5	ug/Kg-dry	1	24-Jan-2018 14:14
2,6-Dinitrotoluene	28.6	U	12.3	28.6	68.5	ug/Kg-dry	1	24-Jan-2018 14:14
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 14:14</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	12.9		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS124-0.0-2.0
 Collection Date: 12-Jan-2018 09:13

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-19
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.6	U	6.06	30.6	73.3	ug/Kg-dry	1	24-Jan-2018 14:50
2,4-Dinitrotoluene	30.6	U	5.43	30.6	73.3	ug/Kg-dry	1	24-Jan-2018 14:50
2,6-Dinitrotoluene	30.6	U	13.2	30.6	73.3	ug/Kg-dry	1	24-Jan-2018 14:50
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 14:50</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	19.0		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS124-2.5-4.5
 Collection Date: 12-Jan-2018 09:15

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-20
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.81	29.3	70.3	ug/Kg-dry	1	24-Jan-2018 15:25
2,4-Dinitrotoluene	29.3	U	5.20	29.3	70.3	ug/Kg-dry	1	24-Jan-2018 15:25
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.3	ug/Kg-dry	1	24-Jan-2018 15:25
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 15:25</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.3		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS124-5.0-7.0
 Collection Date: 12-Jan-2018 09:17

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-21
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.8	U	5.92	29.8	71.6	ug/Kg-dry	1	24-Jan-2018 16:01
2,4-Dinitrotoluene	29.8	U	5.30	29.8	71.6	ug/Kg-dry	1	24-Jan-2018 16:01
2,6-Dinitrotoluene	29.8	U	12.9	29.8	71.6	ug/Kg-dry	1	24-Jan-2018 16:01
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 16:01</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.6		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS124-0.0-2.0-FD
 Collection Date: 12-Jan-2018 09:13

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-22
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.4	U	5.84	29.4	70.6	ug/Kg-dry	1	24-Jan-2018 17:49
2,4-Dinitrotoluene	29.4	U	5.23	29.4	70.6	ug/Kg-dry	1	24-Jan-2018 17:49
2,6-Dinitrotoluene	29.4	U	12.7	29.4	70.6	ug/Kg-dry	1	24-Jan-2018 17:49
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	24-Jan-2018 17:49
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.3		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS124-2.5-4.5-FD
 Collection Date: 12-Jan-2018 09:15

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-23
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.80	29.2	70.2	ug/Kg-dry	1	24-Jan-2018 22:35
2,4-Dinitrotoluene	29.2	U	5.19	29.2	70.2	ug/Kg-dry	1	24-Jan-2018 22:35
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.2	ug/Kg-dry	1	24-Jan-2018 22:35
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 22:35</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	16.2		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS124-5.0-7.0-FD
 Collection Date: 12-Jan-2018 09:17

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-24
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.6	U	6.06	30.6	73.3	ug/Kg-dry	1	24-Jan-2018 23:11
2,4-Dinitrotoluene	30.6	U	5.43	30.6	73.3	ug/Kg-dry	1	24-Jan-2018 23:11
2,6-Dinitrotoluene	30.6	U	13.2	30.6	73.3	ug/Kg-dry	1	24-Jan-2018 23:11
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	24-Jan-2018 23:11
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.6		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS123-0.0-2.0
 Collection Date: 12-Jan-2018 09:26

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-25
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.3	U	6.00	30.3	72.6	ug/Kg-dry	1	24-Jan-2018 23:47
2,4-Dinitrotoluene	30.3	U	5.37	30.3	72.6	ug/Kg-dry	1	24-Jan-2018 23:47
2,6-Dinitrotoluene	30.3	U	13.1	30.3	72.6	ug/Kg-dry	1	24-Jan-2018 23:47
Surr: 1,2-Dinitrobenzene	71.4			0	50-150	%REC	1	24-Jan-2018 23:47
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	19.8		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS123-2.5-4.5
 Collection Date: 12-Jan-2018 09:28

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-26
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.82	29.3	70.4	ug/Kg-dry	1	25-Jan-2018 00:23
2,4-Dinitrotoluene	29.3	U	5.21	29.3	70.4	ug/Kg-dry	1	25-Jan-2018 00:23
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.4	ug/Kg-dry	1	25-Jan-2018 00:23
<i>Surr: 1,2-Dinitrobenzene</i>	71.6			0	50-150	%REC	1	25-Jan-2018 00:23
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.8		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS123-5.0-7.0
 Collection Date: 12-Jan-2018 09:30

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-27
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.81	29.3	70.2	ug/Kg-dry	1	25-Jan-2018 00:59
2,4-Dinitrotoluene	29.3	U	5.20	29.3	70.2	ug/Kg-dry	1	25-Jan-2018 00:59
2,6-Dinitrotoluene	29.3	U	12.6	29.3	70.2	ug/Kg-dry	1	25-Jan-2018 00:59
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 00:59</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	15.0		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS122-0.0-2.0
 Collection Date: 12-Jan-2018 09:36

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-28
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.6	U	6.28	31.6	75.9	ug/Kg-dry	1	25-Jan-2018 01:35
2,4-Dinitrotoluene	31.6	U	5.62	31.6	75.9	ug/Kg-dry	1	25-Jan-2018 01:35
2,6-Dinitrotoluene	31.6	U	13.7	31.6	75.9	ug/Kg-dry	1	25-Jan-2018 01:35
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.3</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 01:35</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	24.0		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS122-2.5-4.5
 Collection Date: 12-Jan-2018 09:38

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-29
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.80	29.2	70.1	ug/Kg-dry	1	25-Jan-2018 02:10
2,4-Dinitrotoluene	29.2	U	5.19	29.2	70.1	ug/Kg-dry	1	25-Jan-2018 02:10
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.1	ug/Kg-dry	1	25-Jan-2018 02:10
<i>Surr: 1,2-Dinitrobenzene</i>	<i>64.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 02:10</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	16.1		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS122-5.0-7.0
 Collection Date: 12-Jan-2018 09:40

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-30
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.0	U	5.56	28.0	67.3	ug/Kg-dry	1	25-Jan-2018 02:46
2,4-Dinitrotoluene	28.0	U	4.98	28.0	67.3	ug/Kg-dry	1	25-Jan-2018 02:46
2,6-Dinitrotoluene	28.0	U	12.1	28.0	67.3	ug/Kg-dry	1	25-Jan-2018 02:46
<i>Surr: 1,2-Dinitrobenzene</i>	68.5			0	50-150	%REC	1	25-Jan-2018 02:46
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.7		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS121-0.0-2.0
 Collection Date: 12-Jan-2018 09:46

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-31
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	33.6	U	6.66	33.6	80.5	ug/Kg-dry	1	25-Jan-2018 04:34
2,4-Dinitrotoluene	33.6	U	5.96	33.6	80.5	ug/Kg-dry	1	25-Jan-2018 04:34
2,6-Dinitrotoluene	33.6	U	14.5	33.6	80.5	ug/Kg-dry	1	25-Jan-2018 04:34
<i>Surr: 1,2-Dinitrobenzene</i>	72.6			0	50-150	%REC	1	25-Jan-2018 04:34
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	26.6		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS121-2.5-4.5
 Collection Date: 12-Jan-2018 09:48

ANALYTICAL REPORT

WorkOrder:HS18010586
 Lab ID:HS18010586-32
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.4	U	6.22	31.4	75.3	ug/Kg-dry	1	25-Jan-2018 05:10
2,4-Dinitrotoluene	31.4	U	5.57	31.4	75.3	ug/Kg-dry	1	25-Jan-2018 05:10
2,6-Dinitrotoluene	31.4	U	13.6	31.4	75.3	ug/Kg-dry	1	25-Jan-2018 05:10
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 05:10</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.7		0.0100	0.0100	0.0100	wt%	1	23-Jan-2018 14:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010586**Batch ID:** 124400 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010586-01	1	2.01	10 (mL)	4975
HS18010586-02	1	2.09	10 (mL)	4785
HS18010586-03	1	2.08	10 (mL)	4808

Batch ID: 124401 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010586-04	1	2.03	10 (mL)	4926
HS18010586-05	1	2.02	10 (mL)	4950
HS18010586-06	1	2.02	10 (mL)	4950
HS18010586-07	1	2.04	10 (mL)	4902
HS18010586-08	1	2.01	10 (mL)	4975
HS18010586-09	1	2.05	10 (mL)	4878
HS18010586-10	1	2.07	10 (mL)	4831
HS18010586-11	1	2.01	10 (mL)	4975
HS18010586-12	1	2	10 (mL)	5000
HS18010586-13	1	2.03	10 (mL)	4926
HS18010586-14	1	2.02	10 (mL)	4950
HS18010586-15	1	2.03	10 (mL)	4926
HS18010586-16	1	2.05	10 (mL)	4878
HS18010586-17	1	2.07	10 (mL)	4831
HS18010586-18	1	2.01	10 (mL)	4.975
HS18010586-19	1	2.02	10 (mL)	4950
HS18010586-20	1	2.04	10 (mL)	4902
HS18010586-21	1	2.01	10 (mL)	4975
HS18010586-22	1	2.03	10 (mL)	4926

Batch ID: 124491 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010586-23	1	2.04	10 (mL)	4902
HS18010586-24	1	2.01	10 (mL)	4975
HS18010586-25	1	2.06	10 (mL)	4854
HS18010586-26	1	2	10 (mL)	5000
HS18010586-27	1	2.01	10 (mL)	4975
HS18010586-28	1	2.08	10 (mL)	4808
HS18010586-29	1	2.04	10 (mL)	4902
HS18010586-30	1	2.09	10 (mL)	4785
HS18010586-31	1	2.03	10 (mL)	4926
HS18010586-32	1	2.01	10 (mL)	4975

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124400 Test Name : EXPLOSIVES BY SW8330B Matrix: Soil						
HS18010586-01	17SB02A-11.0-13.0	12 Jan 2018 08:15		18 Jan 2018 08:52	23 Jan 2018 07:42	1
HS18010586-02	17SB02A-11.0-13.0-FD	12 Jan 2018 08:15		18 Jan 2018 08:52	23 Jan 2018 08:18	1
HS18010586-03	17SB02A-13.0-15.0	12 Jan 2018 08:17		18 Jan 2018 08:52	23 Jan 2018 08:54	1
Batch ID 124401 Test Name : EXPLOSIVES BY SW8330B Matrix: Soil						
HS18010586-04	17SB02A-13.0-15.0-FD	12 Jan 2018 08:17		18 Jan 2018 08:52	24 Jan 2018 04:40	1
HS18010586-05	17SS116-0.0-2.0	12 Jan 2018 08:27		18 Jan 2018 08:52	24 Jan 2018 05:16	1
HS18010586-06	17SS116-2.5-4.5	12 Jan 2018 08:28		18 Jan 2018 08:52	24 Jan 2018 05:52	1
HS18010586-07	17SS116-5.0-7.0	12 Jan 2018 08:30		18 Jan 2018 08:52	24 Jan 2018 06:28	1
HS18010586-08	17SS117-0.0-2.0	12 Jan 2018 08:39		18 Jan 2018 08:52	24 Jan 2018 07:04	1
HS18010586-09	17SS117-2.5-4.5	12 Jan 2018 08:40		18 Jan 2018 08:52	24 Jan 2018 07:40	1
HS18010586-10	17SS117-5.0-7.0	12 Jan 2018 08:42		18 Jan 2018 08:52	24 Jan 2018 08:15	1
HS18010586-11	17SS117-0.0-2.0-FD	12 Jan 2018 08:39		18 Jan 2018 08:52	24 Jan 2018 08:51	1
HS18010586-12	17SS117-2.5-4.5-FD	12 Jan 2018 08:40		18 Jan 2018 08:52	24 Jan 2018 10:39	1
HS18010586-13	17SS118-0.0-2.0	12 Jan 2018 08:50		18 Jan 2018 08:52	24 Jan 2018 11:15	1
HS18010586-14	17SS118-2.5-4.5	12 Jan 2018 08:51		18 Jan 2018 08:52	24 Jan 2018 11:50	1
HS18010586-15	17SS118-5.0-7.0	12 Jan 2018 08:54		18 Jan 2018 08:52	24 Jan 2018 12:26	1
HS18010586-16	17SS119-0.0-2.0	12 Jan 2018 09:02		18 Jan 2018 08:52	24 Jan 2018 13:02	1
HS18010586-17	17SS119-2.5-4.5	12 Jan 2018 09:03		18 Jan 2018 08:52	24 Jan 2018 13:38	1
HS18010586-18	17SS119-5.0-7.0	12 Jan 2018 09:05		18 Jan 2018 08:52	24 Jan 2018 14:14	1
HS18010586-19	17SS124-0.0-2.0	12 Jan 2018 09:13		18 Jan 2018 08:52	24 Jan 2018 14:50	1
HS18010586-20	17SS124-2.5-4.5	12 Jan 2018 09:15		18 Jan 2018 08:52	24 Jan 2018 15:25	1
HS18010586-21	17SS124-5.0-7.0	12 Jan 2018 09:17		18 Jan 2018 08:52	24 Jan 2018 16:01	1
HS18010586-22	17SS124-0.0-2.0-FD	12 Jan 2018 09:13		18 Jan 2018 08:52	24 Jan 2018 17:49	1
Batch ID 124491 Test Name : EXPLOSIVES BY SW8330B Matrix: Soil						
HS18010586-23	17SS124-2.5-4.5-FD	12 Jan 2018 09:15		21 Jan 2018 17:00	24 Jan 2018 22:35	1
HS18010586-24	17SS124-5.0-7.0-FD	12 Jan 2018 09:17		21 Jan 2018 17:00	24 Jan 2018 23:11	1
HS18010586-25	17SS123-0.0-2.0	12 Jan 2018 09:26		21 Jan 2018 17:00	24 Jan 2018 23:47	1
HS18010586-26	17SS123-2.5-4.5	12 Jan 2018 09:28		21 Jan 2018 17:00	25 Jan 2018 00:23	1
HS18010586-27	17SS123-5.0-7.0	12 Jan 2018 09:30		21 Jan 2018 17:00	25 Jan 2018 00:59	1
HS18010586-28	17SS122-0.0-2.0	12 Jan 2018 09:36		21 Jan 2018 17:00	25 Jan 2018 01:35	1
HS18010586-29	17SS122-2.5-4.5	12 Jan 2018 09:38		21 Jan 2018 17:00	25 Jan 2018 02:10	1
HS18010586-30	17SS122-5.0-7.0	12 Jan 2018 09:40		21 Jan 2018 17:00	25 Jan 2018 02:46	1
HS18010586-31	17SS121-0.0-2.0	12 Jan 2018 09:46		21 Jan 2018 17:00	25 Jan 2018 04:34	1
HS18010586-32	17SS121-2.5-4.5	12 Jan 2018 09:48		21 Jan 2018 17:00	25 Jan 2018 05:10	1

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R309436	Test Name : MOISTURE - ASTM D2216			Matrix: Soil		
HS18010586-01	17SB02A-11.0-13.0	12 Jan 2018 08:15			23 Jan 2018 13:45	1
HS18010586-02	17SB02A-11.0-13.0-FD	12 Jan 2018 08:15			23 Jan 2018 13:45	1
HS18010586-03	17SB02A-13.0-15.0	12 Jan 2018 08:17			23 Jan 2018 13:45	1
HS18010586-04	17SB02A-13.0-15.0-FD	12 Jan 2018 08:17			23 Jan 2018 13:45	1
HS18010586-05	17SS116-0.0-2.0	12 Jan 2018 08:27			23 Jan 2018 13:45	1
HS18010586-06	17SS116-2.5-4.5	12 Jan 2018 08:28			23 Jan 2018 13:45	1
HS18010586-07	17SS116-5.0-7.0	12 Jan 2018 08:30			23 Jan 2018 13:45	1
HS18010586-08	17SS117-0.0-2.0	12 Jan 2018 08:39			23 Jan 2018 13:45	1
HS18010586-09	17SS117-2.5-4.5	12 Jan 2018 08:40			23 Jan 2018 13:45	1
HS18010586-10	17SS117-5.0-7.0	12 Jan 2018 08:42			23 Jan 2018 13:45	1
HS18010586-11	17SS117-0.0-2.0-FD	12 Jan 2018 08:39			23 Jan 2018 13:45	1
HS18010586-12	17SS117-2.5-4.5-FD	12 Jan 2018 08:40			23 Jan 2018 13:45	1
HS18010586-13	17SS118-0.0-2.0	12 Jan 2018 08:50			23 Jan 2018 13:45	1
HS18010586-14	17SS118-2.5-4.5	12 Jan 2018 08:51			23 Jan 2018 13:45	1
HS18010586-15	17SS118-5.0-7.0	12 Jan 2018 08:54			23 Jan 2018 13:45	1
HS18010586-16	17SS119-0.0-2.0	12 Jan 2018 09:02			23 Jan 2018 13:45	1
HS18010586-17	17SS119-2.5-4.5	12 Jan 2018 09:03			23 Jan 2018 13:45	1
HS18010586-18	17SS119-5.0-7.0	12 Jan 2018 09:05			23 Jan 2018 13:45	1
HS18010586-19	17SS124-0.0-2.0	12 Jan 2018 09:13			23 Jan 2018 13:45	1
HS18010586-20	17SS124-2.5-4.5	12 Jan 2018 09:15			23 Jan 2018 13:45	1
Batch ID R309437	Test Name : MOISTURE - ASTM D2216			Matrix: Soil		
HS18010586-21	17SS124-5.0-7.0	12 Jan 2018 09:17			23 Jan 2018 14:34	1
HS18010586-22	17SS124-0.0-2.0-FD	12 Jan 2018 09:13			23 Jan 2018 14:34	1
HS18010586-23	17SS124-2.5-4.5-FD	12 Jan 2018 09:15			23 Jan 2018 14:34	1
HS18010586-24	17SS124-5.0-7.0-FD	12 Jan 2018 09:17			23 Jan 2018 14:34	1
HS18010586-25	17SS123-0.0-2.0	12 Jan 2018 09:26			23 Jan 2018 14:34	1
HS18010586-26	17SS123-2.5-4.5	12 Jan 2018 09:28			23 Jan 2018 14:34	1
HS18010586-27	17SS123-5.0-7.0	12 Jan 2018 09:30			23 Jan 2018 14:34	1
HS18010586-28	17SS122-0.0-2.0	12 Jan 2018 09:36			23 Jan 2018 14:34	1
HS18010586-29	17SS122-2.5-4.5	12 Jan 2018 09:38			23 Jan 2018 14:34	1
HS18010586-30	17SS122-5.0-7.0	12 Jan 2018 09:40			23 Jan 2018 14:34	1
HS18010586-31	17SS121-0.0-2.0	12 Jan 2018 09:46			23 Jan 2018 14:34	1
HS18010586-32	17SS121-2.5-4.5	12 Jan 2018 09:48			23 Jan 2018 14:34	1

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

QC BATCH REPORT

Batch ID: 124400		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124400	Units: ug/Kg		Analysis Date: 23-Jan-2018 06:30					
Client ID:	Run ID: HPLC3_309403	SeqNo: 4402276		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1052</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>84.1</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124400	Units: ug/Kg		Analysis Date: 23-Jan-2018 07:06					
Client ID:	Run ID: HPLC3_309403	SeqNo: 4402277		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1369	60.0	1250	0	109	75 - 125			
2,4-Dinitrotoluene	1484	60.0	1250	0	119	82 - 123			
2,6-Dinitrotoluene	1439	60.0	1250	0	115	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1427</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>114</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-15MS	Units: ug/Kg		Analysis Date: 23-Jan-2018 17:55					
Client ID:	Run ID: HPLC3_309403	SeqNo: 4402294		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1123	58.8	1225	0	91.7	75 - 125			
2,4-Dinitrotoluene	1195	58.8	1225	0	97.5	82 - 123			
2,6-Dinitrotoluene	1170	58.8	1225	0	95.5	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>914.5</i>	<i>58.8</i>	<i>1225</i>	<i>0</i>	<i>74.6</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-14MS	Units: ug/Kg		Analysis Date: 23-Jan-2018 16:07					
Client ID:	Run ID: HPLC3_309403	SeqNo: 4402291		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1113	59.1	1232	0	90.4	75 - 125			
2,4-Dinitrotoluene	1197	59.1	1232	0	97.2	82 - 123			
2,6-Dinitrotoluene	1171	59.1	1232	0	95.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>911.9</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>74.0</i>	<i>50 - 150</i>			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

QC BATCH REPORT

Batch ID: 124400		Instrument: HPLC3		Method: SW8330						
MSD		Sample ID: HS18010607-15MSD		Units: ug/Kg		Analysis Date: 23-Jan-2018 18:31				
Client ID:		Run ID: HPLC3_309403		SeqNo: 4402295		PrepDate: 18-Jan-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1129	59.1	1232	0	91.7	75 - 125	1123	0.491	30	
2,4-Dinitrotoluene	1197	59.1	1232	0	97.2	82 - 123	1195	0.235	30	
2,6-Dinitrotoluene	1170	59.1	1232	0	95.0	86 - 119	1170	0.0214	30	
<i>Surr: 1,2-Dinitrobenzene</i>	<i>912.4</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>74.1</i>	<i>50 - 150</i>	<i>914.5</i>	<i>0.227</i>	<i>30</i>	

MSD		Sample ID: HS18010607-14MSD		Units: ug/Kg		Analysis Date: 23-Jan-2018 16:43				
Client ID:		Run ID: HPLC3_309403		SeqNo: 4402292		PrepDate: 18-Jan-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1129	59.4	1238	0	91.2	75 - 125	1113	1.44	30	
2,4-Dinitrotoluene	1210	59.4	1238	0	97.7	82 - 123	1197	1.01	30	
2,6-Dinitrotoluene	1177	59.4	1238	0	95.1	86 - 119	1171	0.494	30	
<i>Surr: 1,2-Dinitrobenzene</i>	<i>920.8</i>	<i>59.4</i>	<i>1238</i>	<i>0</i>	<i>74.4</i>	<i>50 - 150</i>	<i>911.9</i>	<i>0.973</i>	<i>30</i>	

The following samples were analyzed in this batch:

HS18010586-01	HS18010586-02	HS18010586-03
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Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

QC BATCH REPORT

Batch ID: 124401		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124401	Units: ug/Kg		Analysis Date: 24-Jan-2018 03:29					
Client ID:	Run ID: HPLC3_309438	SeqNo: 4402864		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>913.9</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.1</i>	<i>50 - 150</i>			
LCS	Sample ID: LCS-124401	Units: ug/Kg		Analysis Date: 24-Jan-2018 04:05					
Client ID:	Run ID: HPLC3_309438	SeqNo: 4402865		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1144	60.0	1250	0	91.5	75 - 125			
2,4-Dinitrotoluene	1208	60.0	1250	0	96.6	82 - 123			
2,6-Dinitrotoluene	1185	60.0	1250	0	94.8	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>922.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.8</i>	<i>50 - 150</i>			
MS	Sample ID: HS18010607-16MS	Units: ug/Kg		Analysis Date: 24-Jan-2018 19:00					
Client ID:	Run ID: HPLC3_309438	SeqNo: 4404090		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1142	58.5	1220	0	93.7	75 - 125			
2,4-Dinitrotoluene	1209	58.5	1220	0	99.1	82 - 123			
2,6-Dinitrotoluene	1176	58.5	1220	0	96.5	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>911.6</i>	<i>58.5</i>	<i>1220</i>	<i>0</i>	<i>74.8</i>	<i>50 - 150</i>			
MSD	Sample ID: HS18010607-16MSD	Units: ug/Kg		Analysis Date: 24-Jan-2018 19:36					
Client ID:	Run ID: HPLC3_309438	SeqNo: 4404091		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1117	58.3	1214	0	92.1	75 - 125	1142	2.21	30
2,4-Dinitrotoluene	1207	58.3	1214	0	99.5	82 - 123	1209	0.135	30
2,6-Dinitrotoluene	1178	58.3	1214	0	97.0	86 - 119	1176	0.119	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>902.9</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>74.4</i>	<i>50 - 150</i>	<i>911.6</i>	<i>0.964</i>	<i>30</i>

The following samples were analyzed in this batch:

HS18010586-04	HS18010586-05	HS18010586-06	HS18010586-07
HS18010586-08	HS18010586-09	HS18010586-10	HS18010586-11
HS18010586-12	HS18010586-13	HS18010586-14	HS18010586-15
HS18010586-16	HS18010586-17	HS18010586-18	HS18010586-19
HS18010586-20	HS18010586-21	HS18010586-22	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

QC BATCH REPORT

Batch ID: 124491		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124491	Units: ug/Kg		Analysis Date: 24-Jan-2018 21:24					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4404133		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
Surr: 1,2-Dinitrobenzene	901.1	60.0	1250	0	72.1	50 - 150			

LCS	Sample ID: LCS-124491	Units: ug/Kg		Analysis Date: 24-Jan-2018 22:00					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4404134		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1032	60.0	1250	0	82.6	75 - 125			
2,4-Dinitrotoluene	1192	60.0	1250	0	95.4	82 - 123			
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119			
Surr: 1,2-Dinitrobenzene	918.9	60.0	1250	0	73.5	50 - 150			

MS	Sample ID: HS18010605-23MS	Units: ug/Kg		Analysis Date: 25-Jan-2018 13:23					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4405494		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1097	59.7	1244	0	88.2	75 - 125			
2,4-Dinitrotoluene	1239	59.7	1244	0	99.6	82 - 123			
2,6-Dinitrotoluene	1296	59.7	1244	0	104	86 - 119			
Surr: 1,2-Dinitrobenzene	908.8	59.7	1244	0	73.1	50 - 150			

MSD	Sample ID: HS18010605-23MSD	Units: ug/Kg		Analysis Date: 25-Jan-2018 13:59					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4405495		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1084	59.1	1232	0	88.0	75 - 125	1097	1.23	30
2,4-Dinitrotoluene	1172	59.1	1232	0	95.2	82 - 123	1239	5.55	30
2,6-Dinitrotoluene	1142	59.1	1232	0	92.7	86 - 119	1296	12.6	30
Surr: 1,2-Dinitrobenzene	897.1	59.1	1232	0	72.8	50 - 150	908.8	1.29	30

The following samples were analyzed in this batch:		HS18010586-23	HS18010586-24	HS18010586-25	HS18010586-26
		HS18010586-27	HS18010586-28	HS18010586-29	HS18010586-30
		HS18010586-31	HS18010586-32		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010586

QC BATCH REPORT

Batch ID: R309436		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010586-15DUP	Units: wt%		Analysis Date: 23-Jan-2018 13:45	
Client ID: 17SS118-5.0-7.0	Run ID: Balance1_309436		SeqNo: 4402832	PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	14.9	0.0100			14.4 3.41 20

The following samples were analyzed in this batch:

HS18010586-01	HS18010586-02	HS18010586-03	HS18010586-04
HS18010586-05	HS18010586-06	HS18010586-07	HS18010586-08
HS18010586-09	HS18010586-10	HS18010586-11	HS18010586-12
HS18010586-13	HS18010586-14	HS18010586-15	HS18010586-16
HS18010586-17	HS18010586-18	HS18010586-19	HS18010586-20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010586

QC BATCH REPORT

Batch ID: R309437		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010586-32DUP	Units: wt%		Analysis Date: 23-Jan-2018 14:34	
Client ID: 17SS121-2.5-4.5	Run ID: Balance1_309437	SeqNo: 4402845		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	21.1	0.0100			20.7 1.91 20

The following samples were analyzed in this batch:

HS18010586-21	HS18010586-22	HS18010586-23	HS18010586-24
HS18010586-25	HS18010586-26	HS18010586-27	HS18010586-28
HS18010586-29	HS18010586-30	HS18010586-31	HS18010586-32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010586

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018

Date: 10-Apr-18

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18010586

Date/Time Received: **15-Jan-2018 09:15**
Received by: **JRM**

Checklist completed by: Paresh M. Giga 16-Jan-2018
eSignature Date

Reviewed by: RJ Modashia 17-Jan-2018
eSignature Date

Matrices: **Soil**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☒	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.7c/0.2c;0.6c/0.1c;0.9c/0.4c;0.7c/0.2c U/C IR11

Cooler(s)/Kit(s): 42760;24765;23880;3333

Date/Time sample(s) sent to storage: 1/16/17 12:25

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: IDs differ : 17SS127-0.0-2.0; 17SS127-2.5-4.5; 17SS127-5.0-7.0. Jar labels : 17SS123-0.0-2.0; 17SS123-2.5-4.5; 17SS123-5.0-7.0. Dates/Times match. Logged in IDs per chains

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:



COC ID:		17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:							
PROJECT/CLIENT INFO										LABORATORY				OTHER INFO			
Facility Name		Longhorn AAP				Lab Name		ALS Laboratories		Email Invoice To		FedInvoices@CBIFederalServices.com					
Project Number		501032				Lab Contact		Sonia West									
		LHAAP-17				Email		Sonia.West@alsglobal.com		Email Report To		Sharon.Pennington@CBIFederalServices.com					
Address		1203-B East Grand Avenue				Address		10450 Stancliff Rd., Suite 210		Mail Reports To		Sharon Pennington					
		PMB 202								Address		2410 Cherahala Blvd.					
City		Marshall		State TX		City		Houston		State TX		City Knoxville					
Postal Code		75670		Country USA		Postal Code		77099		Country USA		Postal Code 37932					
Phone Number		713.243.7264				Phone Number		281.575.2132 or 281.530.5656									
Project Manager		Praveen Srivastav								Shipping Company		FedEx					
SAMPLE DETAILS										ANALYSIS REQUESTED							
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330								
17SB02A-11.0-13.0	LHAAP-17	11	13	FT	SO	1/12/2018	0815	1	X								
17SB02A-11.0-13.0-FD	LHAAP-17	11	13	FT	SO	1/12/2018	0815	1	X								
17SB02A-13.0-15.0	LHAAP-17	13	15	FT	SO	1/12/2018	0817	1	X								
17SB02A-13.0-15.0-FD	LHAAP-17	13	15	FT	SO	1/12/2018	0817	1	X								
17SS116-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0827	1	X								
17SS116-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0828	1	X								
17SS116-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0830	1	X								
17SS117-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0839	1	X								
17SS117-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0840	1	X								
17SS117-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0842	1	X								
17SS117-0.0-2.0-FD	LHAAP-17	0	2	FT	SO	1/12/2018	0839	1	X								
17SS117-2.5-4.5-FD	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0840	1	X								
17SS118-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0850	1	X								
17SS118-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0851	1	X								
17SS118-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0854	1	X								
17SS119-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0902	1	X								
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS					RELINQUISHED BY/AFFILIATION			DATE/TIME		ACCEPTED BY/AFFILIATION		DATE/TIME					
					David R...			1/12/18		J.M.		1.13.18 09:15					
					D...			1900									
												ok.					

HS18010586

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant

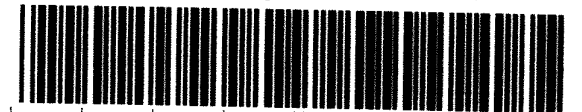


42760 0.70 # 11
24765 0.60
23880 0.90 C/F-0.50
23880 0.70



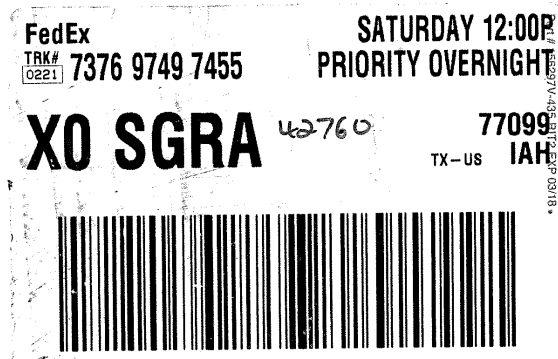
COC ID:		17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:							
PROJECT/CLIENT INFO										LABORATORY				OTHER INFO			
Facility Name		Longhorn AAP				Lab Name		ALS Laboratories		Email Invoice To		FedInvoices@CBIFederalServices.com					
Project Number		501032				Lab Contact		Sonia West									
		LHAAP-17				Email		Sonia.West@alsglobal.com		Email Report To		Sharon.Pennington@CBIFederalServices.com					
Address		1203-B East Grand Avenue				Address		10450 Stancliff Rd., Suite 210		Mail Reports To		Sharon Pennington					
		PMB 202								Address		2410 Cherahala Blvd.					
City		Marshall		State	TX	City		Houston	State	TX	City		Knoxville	State	TN		
Postal Code		75670		Country	USA	Postal Code		77099	Country	USA	Postal Code		37932	Country	USA		
Phone Number		713.243.7264				Phone Number		281.575.2132 or 281.530.5656									
Project Manager		Praveen Srivastav										Shipping Company		FedEx			
SAMPLE DETAILS										ANALYSIS REQUESTED							
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330								
17SS119-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0903	1	X								
17SS119-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0905	1	X								
17SS124-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0913	1	X								
17SS124-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0915	1	X								
17SS124-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0917	1	X								
17SS124-0.0-2.0-FD	LHAAP-17	0	2	FT	SO	1/12/2018	0913	1	X								
17SS124-2.5-4.5-FD	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0915	1	X								
17SS124-5.0-7.0-FD	LHAAP-17	5	7	FT	SO	1/12/2018	0917	1	X								
17SS127-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0926	1	X								
17SS127-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0928	1	X								
17SS127-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0930	1	X								
17SS122-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0936	1	X								
17SS122-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0938	1	X								
17SS122-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0940	1	X								
17SS121-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	0946	1	X								
17SS121-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0948	1	X								
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS					RELINQUISHED BY/AFFILIATION			DATE/TIME		ACCEPTED BY/AFFILIATION			DATE/TIME				
					David R...			1/12/18		Jim			1.15.18 - 09:15				
								1960									

HS18010586
 Aptim Environmental & Infrastructure, Inc.
 Longhorn Army Ammunition Plant



CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *in*
42760 **LIAAP**

42760 JAN 15 2018



CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *is*
24765 **LHAAP**

24765 JAN 15 2018

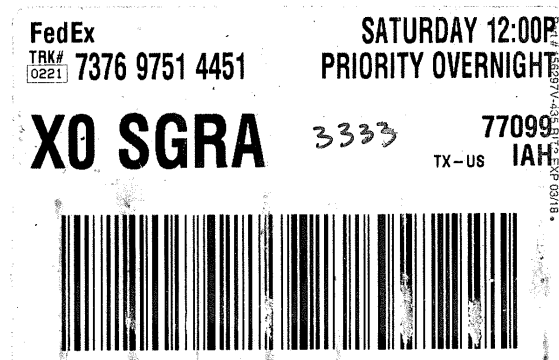


CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *Dh*
23880 LHAAP

23880 JAN 15 2018



CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *Dh*
3333 JAN 15 2018
3333 LHAAP





10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 10, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010597**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 32 sample(s) on Jan 15, 2018 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: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010597

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010597-01	17SS121-5.0-70	Soil		12-Jan-2018 09:50	15-Jan-2018 09:15	☐
HS18010597-02	17SS121-0.0-2.0FD	Soil		12-Jan-2018 09:46	15-Jan-2018 09:15	☐
HS18010597-03	17SS121-2.5-4.5-FD	Soil		12-Jan-2018 09:48	15-Jan-2018 09:15	☐
HS18010597-04	17SS121-5.0-7.0-FD	Soil		12-Jan-2018 09:50	15-Jan-2018 09:15	☐
HS18010597-05	17SS91-0.0-2.0	Soil		12-Jan-2018 10:34	15-Jan-2018 09:15	☐
HS18010597-06	17SS91-2.5-4.5	Soil		12-Jan-2018 10:36	15-Jan-2018 09:15	☐
HS18010597-07	17SS91-5.0-7.0	Soil		12-Jan-2018 10:37	15-Jan-2018 09:15	☐
HS18010597-08	17SS91-7.5-9.5	Soil		12-Jan-2018 10:40	15-Jan-2018 09:15	☐
HS18010597-09	17SS91-10.0-12.0	Soil		12-Jan-2018 10:43	15-Jan-2018 09:15	☐
HS18010597-10	17SB29A-2.5-3.0	Soil		12-Jan-2018 10:52	15-Jan-2018 09:15	☐
HS18010597-11	17SB29A-3.5-5	Soil		12-Jan-2018 10:54	15-Jan-2018 09:15	☐
HS18010597-12	17SB29A-5.5-7.0	Soil		12-Jan-2018 10:56	15-Jan-2018 09:15	☐
HS18010597-13	17SB03A-7.5-9.5	Soil		12-Jan-2018 11:06	15-Jan-2018 09:15	☐
HS18010597-14	17SS03A-10.0-12.0	Soil		12-Jan-2018 11:08	15-Jan-2018 09:15	☐
HS18010597-15	17SB03A-12.5-14.5	Soil		12-Jan-2018 11:10	15-Jan-2018 09:15	☐
HS18010597-16	17SS88-0.0-2.0	Soil		12-Jan-2018 11:20	15-Jan-2018 09:15	☐
HS18010597-17	17SS88-2.5-4.5	Soil		12-Jan-2018 11:22	15-Jan-2018 09:15	☐
HS18010597-18	17SS88-5.0-7.0	Soil		12-Jan-2018 11:24	15-Jan-2018 09:15	☐
HS18010597-19	17SS88-7.5-9.5	Soil		12-Jan-2018 11:26	15-Jan-2018 09:15	☐
HS18010597-20	17SS88-10.0-12.0	Soil		12-Jan-2018 11:28	15-Jan-2018 09:15	☐
HS18010597-21	17SS89-0.0-2.0	Soil		12-Jan-2018 11:35	15-Jan-2018 09:15	☐
HS18010597-22	17SS89-2.5-4.5	Soil		12-Jan-2018 11:37	15-Jan-2018 09:15	☐
HS18010597-23	17SS89-5.0-7.0	Soil		12-Jan-2018 11:39	15-Jan-2018 09:15	☐
HS18010597-24	17SS89-7.5-9.5	Soil		12-Jan-2018 11:41	15-Jan-2018 09:15	☐
HS18010597-25	17SS89-10.0-12.0	Soil		12-Jan-2018 11:43	15-Jan-2018 09:15	☐
HS18010597-26	17SS25A-2.5-4.5	Soil		12-Jan-2018 11:47	15-Jan-2018 09:15	☐
HS18010597-27	17SS25A-5.0-7.0	Soil		12-Jan-2018 11:49	15-Jan-2018 09:15	☐

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010597

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010597-28	17SS90-0.0-2.0	Soil		12-Jan-2018 13:00	15-Jan-2018 09:15	☐
HS18010597-29	17SS90-2.5-4.5	Soil		12-Jan-2018 13:02	15-Jan-2018 09:15	☐
HS18010597-30	17SS90-5.0-7.0	Soil		12-Jan-2018 13:04	15-Jan-2018 09:15	☐
HS18010597-31	17SS90-7.5-9.5	Soil		12-Jan-2018 13:06	15-Jan-2018 09:15	☐
HS18010597-32	17SS90-10.0-12.0	Soil		12-Jan-2018 13:08	15-Jan-2018 09:15	☐

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010597

CASE NARRATIVE

HPLC by Method SW8330**Batch ID: 124492****Sample ID: 17SS91-7.5-9.5 (HS18010597-08)**

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: HS18010605-22MS

- MS and MSD are for an unrelated sample

Batch ID: 124491,124532

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216**Batch ID: R309521,R309522**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS121-5.0-70
 Collection Date: 12-Jan-2018 09:50

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.8	U	5.51	27.8	66.7	ug/Kg-dry	1	25-Jan-2018 16:58
2,4-Dinitrotoluene	27.8	U	4.93	27.8	66.7	ug/Kg-dry	1	25-Jan-2018 16:58
2,6-Dinitrotoluene	27.8	U	12.0	27.8	66.7	ug/Kg-dry	1	25-Jan-2018 16:58
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 16:58</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	13.9		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS121-0.0-2.0FD
 Collection Date: 12-Jan-2018 09:46

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.7	U	6.49	32.7	78.6	ug/Kg-dry	1	25-Jan-2018 17:34
2,4-Dinitrotoluene	32.7	U	5.81	32.7	78.6	ug/Kg-dry	1	25-Jan-2018 17:34
2,6-Dinitrotoluene	32.7	U	14.1	32.7	78.6	ug/Kg-dry	1	25-Jan-2018 17:34
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 17:34</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	24.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS121-2.5-4.5-FD
 Collection Date: 12-Jan-2018 09:48

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-03
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.9	U	5.53	27.9	66.9	ug/Kg-dry	1	25-Jan-2018 18:10
2,4-Dinitrotoluene	27.9	U	4.95	27.9	66.9	ug/Kg-dry	1	25-Jan-2018 18:10
2,6-Dinitrotoluene	27.9	U	12.0	27.9	66.9	ug/Kg-dry	1	25-Jan-2018 18:10
<i>Surr: 1,2-Dinitrobenzene</i>	73.5			0	50-150	%REC	1	25-Jan-2018 18:10
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	12.9		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS121-5.0-7.0-FD
 Collection Date: 12-Jan-2018 09:50

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-04
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.4	U	5.63	28.4	68.1	ug/Kg-dry	1	25-Jan-2018 18:46
2,4-Dinitrotoluene	28.4	U	5.04	28.4	68.1	ug/Kg-dry	1	25-Jan-2018 18:46
2,6-Dinitrotoluene	28.4	U	12.3	28.4	68.1	ug/Kg-dry	1	25-Jan-2018 18:46
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	25-Jan-2018 18:46
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS91-0.0-2.0
 Collection Date: 12-Jan-2018 10:34

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-05
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	39,600		58.9	297	713	ug/Kg-dry	10	27-Jan-2018 02:52
2,4-Dinitrotoluene	590		5.28	29.7	71.3	ug/Kg-dry	1	25-Jan-2018 19:22
2,6-Dinitrotoluene	213		12.8	29.7	71.3	ug/Kg-dry	1	25-Jan-2018 19:22
Surr: 1,2-Dinitrobenzene	68.1			0	50-150	%REC	10	27-Jan-2018 02:52
Surr: 1,2-Dinitrobenzene	73.2			0	50-150	%REC	1	25-Jan-2018 19:22
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.1		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS91-2.5-4.5
 Collection Date: 12-Jan-2018 10:36

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-06
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	19,800		59.6	300	721	ug/Kg-dry	10	27-Jan-2018 03:28
2,4-Dinitrotoluene	30.0	U	5.33	30.0	72.1	ug/Kg-dry	1	25-Jan-2018 19:58
2,6-Dinitrotoluene	30.0	U	13.0	30.0	72.1	ug/Kg-dry	1	25-Jan-2018 19:58
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.1</i>			0	<i>50-150</i>	%REC	<i>10</i>	<i>27-Jan-2018 03:28</i>
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.2</i>			0	<i>50-150</i>	%REC	<i>1</i>	<i>25-Jan-2018 19:58</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS91-5.0-7.0
 Collection Date: 12-Jan-2018 10:37

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-07
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.7	U	6.49	32.7	78.6	ug/Kg-dry	1	25-Jan-2018 20:33
2,4-Dinitrotoluene	32.7	U	5.81	32.7	78.6	ug/Kg-dry	1	25-Jan-2018 20:33
2,6-Dinitrotoluene	32.7	U	14.1	32.7	78.6	ug/Kg-dry	1	25-Jan-2018 20:33
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 20:33</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	24.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS91-7.5-9.5
 Collection Date: 12-Jan-2018 10:40

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-08
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	688,000		3140	15800	38000	ug/Kg-dry	500	27-Jan-2018 04:03
2,4-Dinitrotoluene	1,520		5.63	31.7	76.0	ug/Kg-dry	1	25-Jan-2018 21:09
2,6-Dinitrotoluene	822		13.7	31.7	76.0	ug/Kg-dry	1	25-Jan-2018 21:09
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	500	27-Jan-2018 04:03
Surr: 1,2-Dinitrobenzene	72.8			0	50-150	%REC	1	25-Jan-2018 21:09
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.1		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS91-10.0-12.0
 Collection Date: 12-Jan-2018 10:43

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-09
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.8	U	5.70	28.8	69.0	ug/Kg-dry	1	25-Jan-2018 22:57
2,4-Dinitrotoluene	28.8	U	5.11	28.8	69.0	ug/Kg-dry	1	25-Jan-2018 22:57
2,6-Dinitrotoluene	28.8	U	12.4	28.8	69.0	ug/Kg-dry	1	25-Jan-2018 22:57
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 22:57</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB29A-2.5-3.0
 Collection Date: 12-Jan-2018 10:52

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-10
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	24,600		58.9	297	713	ug/Kg-dry	10	27-Jan-2018 04:39
2,4-Dinitrotoluene	68.2	J	5.27	29.7	71.3	ug/Kg-dry	1	25-Jan-2018 23:33
2,6-Dinitrotoluene	29.7	U	12.8	29.7	71.3	ug/Kg-dry	1	25-Jan-2018 23:33
Surr: 1,2-Dinitrobenzene	72.1			0	50-150	%REC	10	27-Jan-2018 04:39
Surr: 1,2-Dinitrobenzene	72.9			0	50-150	%REC	1	25-Jan-2018 23:33
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB29A-3.5-5
 Collection Date: 12-Jan-2018 10:54

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-11
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	12,500		40.5	204	490	ug/Kg-dry	5	27-Jan-2018 05:15
2,4-Dinitrotoluene	98.8		7.25	40.8	97.9	ug/Kg-dry	1	26-Jan-2018 00:08
2,6-Dinitrotoluene	71.8	J	17.6	40.8	97.9	ug/Kg-dry	1	26-Jan-2018 00:08
Surr: 1,2-Dinitrobenzene	72.3			0	50-150	%REC	5	27-Jan-2018 05:15
Surr: 1,2-Dinitrobenzene	73.1			0	50-150	%REC	1	26-Jan-2018 00:08
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	40.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB29A-5.5-7.0
 Collection Date: 12-Jan-2018 10:56

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-12
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	838		6.59	33.2	79.8	ug/Kg-dry	1	26-Jan-2018 00:44
2,4-Dinitrotoluene	33.2	U	5.90	33.2	79.8	ug/Kg-dry	1	26-Jan-2018 00:44
2,6-Dinitrotoluene	33.2	U	14.4	33.2	79.8	ug/Kg-dry	1	26-Jan-2018 00:44
<i>Surr: 1,2-Dinitrobenzene</i>	<i>81.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 00:44</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	25.9		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB03A-7.5-9.5
 Collection Date: 12-Jan-2018 11:06

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-13
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	280		6.34	32.0	76.7	ug/Kg-dry	1	26-Jan-2018 01:20
2,4-Dinitrotoluene	32.0	U	5.68	32.0	76.7	ug/Kg-dry	1	26-Jan-2018 01:20
2,6-Dinitrotoluene	32.0	U	13.8	32.0	76.7	ug/Kg-dry	1	26-Jan-2018 01:20
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 01:20</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS03A-10.0-12.0
 Collection Date: 12-Jan-2018 11:08

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-14
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.6	U	5.87	29.6	71.0	ug/Kg-dry	1	26-Jan-2018 01:56
2,4-Dinitrotoluene	29.6	U	5.25	29.6	71.0	ug/Kg-dry	1	26-Jan-2018 01:56
2,6-Dinitrotoluene	29.6	U	12.8	29.6	71.0	ug/Kg-dry	1	26-Jan-2018 01:56
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 01:56</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.9		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB03A-12.5-14.5
 Collection Date: 12-Jan-2018 11:10

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-15
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	430		6.43	32.4	77.8	ug/Kg-dry	1	26-Jan-2018 02:32
2,4-Dinitrotoluene	86.6		5.76	32.4	77.8	ug/Kg-dry	1	26-Jan-2018 02:32
2,6-Dinitrotoluene	32.4	U	14.0	32.4	77.8	ug/Kg-dry	1	26-Jan-2018 02:32
Surr: 1,2-Dinitrobenzene	72.2			0	50-150	%REC	1	26-Jan-2018 02:32
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	23.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS88-0.0-2.0
 Collection Date: 12-Jan-2018 11:20

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-16
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	704		6.06	30.6	73.3	ug/Kg-dry	1	26-Jan-2018 03:08
2,4-Dinitrotoluene	1,480		5.43	30.6	73.3	ug/Kg-dry	1	26-Jan-2018 03:08
2,6-Dinitrotoluene	780		13.2	30.6	73.3	ug/Kg-dry	1	26-Jan-2018 03:08
Surr: 1,2-Dinitrobenzene	74.2			0	50-150	%REC	1	26-Jan-2018 03:08
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	18.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS88-2.5-4.5
 Collection Date: 12-Jan-2018 11:22

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-17
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.9	U	5.73	28.9	69.3	ug/Kg-dry	1	26-Jan-2018 03:44
2,4-Dinitrotoluene	28.9	U	5.13	28.9	69.3	ug/Kg-dry	1	26-Jan-2018 03:44
2,6-Dinitrotoluene	28.9	U	12.5	28.9	69.3	ug/Kg-dry	1	26-Jan-2018 03:44
<i>Surr: 1,2-Dinitrobenzene</i>	<i>70.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 03:44</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS88-5.0-7.0
 Collection Date: 12-Jan-2018 11:24

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-18
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.0	U	6.15	31.0	74.4	ug/Kg-dry	1	26-Jan-2018 04:20
2,4-Dinitrotoluene	31.0	U	5.50	31.0	74.4	ug/Kg-dry	1	26-Jan-2018 04:20
2,6-Dinitrotoluene	31.0	U	13.4	31.0	74.4	ug/Kg-dry	1	26-Jan-2018 04:20
<i>Surr: 1,2-Dinitrobenzene</i>	72.3			0	50-150	%REC	1	26-Jan-2018 04:20
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.1		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS88-7.5-9.5
 Collection Date: 12-Jan-2018 11:26

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-19
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.7	U	5.90	29.7	71.3	ug/Kg-dry	1	26-Jan-2018 06:07
2,4-Dinitrotoluene	29.7	U	5.28	29.7	71.3	ug/Kg-dry	1	26-Jan-2018 06:07
2,6-Dinitrotoluene	29.7	U	12.8	29.7	71.3	ug/Kg-dry	1	26-Jan-2018 06:07
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 06:07</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 10:47

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS88-10.0-12.0
 Collection Date: 12-Jan-2018 11:28

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-20
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	5.99	30.2	72.4	ug/Kg-dry	1	25-Jan-2018 05:46
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.4	ug/Kg-dry	1	25-Jan-2018 05:46
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.4	ug/Kg-dry	1	25-Jan-2018 05:46
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 05:46</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS89-0.0-2.0
 Collection Date: 12-Jan-2018 11:35

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-21
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.5	U	5.46	27.5	66.0	ug/Kg-dry	1	25-Jan-2018 06:21
2,4-Dinitrotoluene	27.5	U	4.89	27.5	66.0	ug/Kg-dry	1	25-Jan-2018 06:21
2,6-Dinitrotoluene	27.5	U	11.9	27.5	66.0	ug/Kg-dry	1	25-Jan-2018 06:21
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 06:21</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	12.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS89-2.5-4.5
 Collection Date: 12-Jan-2018 11:37

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-22
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.5	U	6.25	31.5	75.6	ug/Kg-dry	1	25-Jan-2018 06:57
2,4-Dinitrotoluene	31.5	U	5.59	31.5	75.6	ug/Kg-dry	1	25-Jan-2018 06:57
2,6-Dinitrotoluene	31.5	U	13.6	31.5	75.6	ug/Kg-dry	1	25-Jan-2018 06:57
<i>Surr: 1,2-Dinitrobenzene</i>	72.3			0	50-150	%REC	1	25-Jan-2018 06:57
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS89-5.0-7.0
 Collection Date: 12-Jan-2018 11:39

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-23
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.7	U	6.29	31.7	76.0	ug/Kg-dry	1	25-Jan-2018 07:33
2,4-Dinitrotoluene	31.7	U	5.63	31.7	76.0	ug/Kg-dry	1	25-Jan-2018 07:33
2,6-Dinitrotoluene	31.7	U	13.7	31.7	76.0	ug/Kg-dry	1	25-Jan-2018 07:33
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 07:33</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	23.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS89-7.5-9.5
 Collection Date: 12-Jan-2018 11:41

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-24
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.8	U	6.12	30.8	74.0	ug/Kg-dry	1	25-Jan-2018 08:09
2,4-Dinitrotoluene	30.8	U	5.48	30.8	74.0	ug/Kg-dry	1	25-Jan-2018 08:09
2,6-Dinitrotoluene	30.8	U	13.3	30.8	74.0	ug/Kg-dry	1	25-Jan-2018 08:09
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 08:09</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS89-10.0-12.0
 Collection Date: 12-Jan-2018 11:43

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-25
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.9	U	5.73	28.9	69.3	ug/Kg-dry	1	25-Jan-2018 08:45
2,4-Dinitrotoluene	28.9	U	5.13	28.9	69.3	ug/Kg-dry	1	25-Jan-2018 08:45
2,6-Dinitrotoluene	28.9	U	12.5	28.9	69.3	ug/Kg-dry	1	25-Jan-2018 08:45
<i>Surr: 1,2-Dinitrobenzene</i>	72.6			0	50-150	%REC	1	25-Jan-2018 08:45
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.5		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS25A-2.5-4.5
 Collection Date: 12-Jan-2018 11:47

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-26
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	177		6.20	31.3	75.0	ug/Kg-dry	1	25-Jan-2018 09:21
2,4-Dinitrotoluene	87.3		5.55	31.3	75.0	ug/Kg-dry	1	25-Jan-2018 09:21
2,6-Dinitrotoluene	31.3	U	13.5	31.3	75.0	ug/Kg-dry	1	25-Jan-2018 09:21
Surr: 1,2-Dinitrobenzene	72.4			0	50-150	%REC	1	25-Jan-2018 09:21
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	20.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS25A-5.0-7.0
 Collection Date: 12-Jan-2018 11:49

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-27
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.2	U	6.19	31.2	74.8	ug/Kg-dry	1	25-Jan-2018 09:57
2,4-Dinitrotoluene	31.2	U	5.54	31.2	74.8	ug/Kg-dry	1	25-Jan-2018 09:57
2,6-Dinitrotoluene	31.2	U	13.5	31.2	74.8	ug/Kg-dry	1	25-Jan-2018 09:57
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	25-Jan-2018 09:57
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-0.0-2.0
 Collection Date: 12-Jan-2018 13:00

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-28
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.5	U	5.45	27.5	65.9	ug/Kg-dry	1	25-Jan-2018 12:11
2,4-Dinitrotoluene	27.5	U	4.88	27.5	65.9	ug/Kg-dry	1	25-Jan-2018 12:11
2,6-Dinitrotoluene	27.5	U	11.9	27.5	65.9	ug/Kg-dry	1	25-Jan-2018 12:11
<i>Surr: 1,2-Dinitrobenzene</i>	72.3			0	50-150	%REC	1	25-Jan-2018 12:11
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	9.87		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-2.5-4.5
 Collection Date: 12-Jan-2018 13:02

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-29
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.7	U	6.09	30.7	73.6	ug/Kg-dry	1	27-Jan-2018 08:14
2,4-Dinitrotoluene	30.7	U	5.45	30.7	73.6	ug/Kg-dry	1	27-Jan-2018 08:14
2,6-Dinitrotoluene	30.7	U	13.3	30.7	73.6	ug/Kg-dry	1	27-Jan-2018 08:14
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	27-Jan-2018 08:14
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.1		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-5.0-7.0
 Collection Date: 12-Jan-2018 13:04

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-30
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.1	U	6.16	31.1	74.5	ug/Kg-dry	1	27-Jan-2018 08:50
2,4-Dinitrotoluene	31.1	U	5.52	31.1	74.5	ug/Kg-dry	1	27-Jan-2018 08:50
2,6-Dinitrotoluene	31.1	U	13.4	31.1	74.5	ug/Kg-dry	1	27-Jan-2018 08:50
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.8</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>27-Jan-2018 08:50</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-7.5-9.5
 Collection Date: 12-Jan-2018 13:06

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-31
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	5.99	30.2	72.5	ug/Kg-dry	1	27-Jan-2018 09:26
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.5	ug/Kg-dry	1	27-Jan-2018 09:26
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.5	ug/Kg-dry	1	27-Jan-2018 09:26
<i>Surr: 1,2-Dinitrobenzene</i>	73.3			0	50-150	%REC	1	27-Jan-2018 09:26
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-10.0-12.0
 Collection Date: 12-Jan-2018 13:08

ANALYTICAL REPORT

WorkOrder:HS18010597
 Lab ID:HS18010597-32
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.3	U	6.22	31.3	75.2	ug/Kg-dry	1	27-Jan-2018 10:02
2,4-Dinitrotoluene	31.3	U	5.56	31.3	75.2	ug/Kg-dry	1	27-Jan-2018 10:02
2,6-Dinitrotoluene	31.3	U	13.5	31.3	75.2	ug/Kg-dry	1	27-Jan-2018 10:02
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>27-Jan-2018 10:02</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	21.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010597**Batch ID:** 124491 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010597-20	1	2.02	10 (mL)	4950
HS18010597-21	1	2.07	10 (mL)	4831
HS18010597-22	1	2.01	10 (mL)	4975
HS18010597-23	1	2.06	10 (mL)	4854
HS18010597-24	1	2.09	10 (mL)	4785
HS18010597-25	1	2.1	10 (mL)	4762
HS18010597-26	1	2.01	10 (mL)	4.975
HS18010597-27	1	2.03	10 (mL)	4926
HS18010597-28	1	2.02	10 (mL)	4950

Batch ID: 124492 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010597-01	1	2.09	10 (mL)	4.785
HS18010597-02	1	2.01	10 (mL)	4.975
HS18010597-03	1	2.06	10 (mL)	4.854
HS18010597-04	1	2.08	10 (mL)	4.808
HS18010597-05	1	2.03	10 (mL)	4.926
HS18010597-06	1	2.05	10 (mL)	4.878
HS18010597-07	1	2.01	10 (mL)	4.975
HS18010597-08	1	2	10 (mL)	5
HS18010597-09	1	2.08	10 (mL)	4.808
HS18010597-10	1	2.1	10 (mL)	4.762
HS18010597-11	1	2.07	10 (mL)	4.831
HS18010597-12	1	2.03	10 (mL)	4.926
HS18010597-13	1	2.01	10 (mL)	4.975
HS18010597-14	1	2.06	10 (mL)	4.854
HS18010597-15	1	2.01	10 (mL)	4.975
HS18010597-16	1	2	10 (mL)	5
HS18010597-17	1	2.06	10 (mL)	4.854
HS18010597-18	1	2.02	10 (mL)	4.95
HS18010597-19	1	2.01	10 (mL)	4.975

Batch ID: 124532 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010597-29	1	2.04	10 (mL)	4.902
HS18010597-30	1	2.03	10 (mL)	4.926
HS18010597-31	1	2.01	10 (mL)	4.975
HS18010597-32	1	2.02	10 (mL)	4.95

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010597

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124491 Test Name : EXPLOSIVES BY SW8330B Matrix: Soil						
HS18010597-20	17SS88-10.0-12.0	12 Jan 2018 11:28		21 Jan 2018 17:00	25 Jan 2018 05:46	1
HS18010597-21	17SS89-0.0-2.0	12 Jan 2018 11:35		21 Jan 2018 17:00	25 Jan 2018 06:21	1
HS18010597-22	17SS89-2.5-4.5	12 Jan 2018 11:37		21 Jan 2018 17:00	25 Jan 2018 06:57	1
HS18010597-23	17SS89-5.0-7.0	12 Jan 2018 11:39		21 Jan 2018 17:00	25 Jan 2018 07:33	1
HS18010597-24	17SS89-7.5-9.5	12 Jan 2018 11:41		21 Jan 2018 17:00	25 Jan 2018 08:09	1
HS18010597-25	17SS89-10.0-12.0	12 Jan 2018 11:43		21 Jan 2018 17:00	25 Jan 2018 08:45	1
HS18010597-26	17SS25A-2.5-4.5	12 Jan 2018 11:47		21 Jan 2018 17:00	25 Jan 2018 09:21	1
HS18010597-27	17SS25A-5.0-7.0	12 Jan 2018 11:49		21 Jan 2018 17:00	25 Jan 2018 09:57	1
HS18010597-28	17SS90-0.0-2.0	12 Jan 2018 13:00		21 Jan 2018 17:00	25 Jan 2018 12:11	1
Batch ID 124492 Test Name : EXPLOSIVES BY SW8330B Matrix: Soil						
HS18010597-01	17SS121-5.0-7.0	12 Jan 2018 09:50		21 Jan 2018 17:00	25 Jan 2018 16:58	1
HS18010597-02	17SS121-0.0-2.0FD	12 Jan 2018 09:46		21 Jan 2018 17:00	25 Jan 2018 17:34	1
HS18010597-03	17SS121-2.5-4.5-FD	12 Jan 2018 09:48		21 Jan 2018 17:00	25 Jan 2018 18:10	1
HS18010597-04	17SS121-5.0-7.0-FD	12 Jan 2018 09:50		21 Jan 2018 17:00	25 Jan 2018 18:46	1
HS18010597-05	17SS91-0.0-2.0	12 Jan 2018 10:34		21 Jan 2018 17:00	27 Jan 2018 02:52	10
HS18010597-05	17SS91-0.0-2.0	12 Jan 2018 10:34		21 Jan 2018 17:00	25 Jan 2018 19:22	1
HS18010597-06	17SS91-2.5-4.5	12 Jan 2018 10:36		21 Jan 2018 17:00	27 Jan 2018 03:28	10
HS18010597-06	17SS91-2.5-4.5	12 Jan 2018 10:36		21 Jan 2018 17:00	25 Jan 2018 19:58	1
HS18010597-07	17SS91-5.0-7.0	12 Jan 2018 10:37		21 Jan 2018 17:00	25 Jan 2018 20:33	1
HS18010597-08	17SS91-7.5-9.5	12 Jan 2018 10:40		21 Jan 2018 17:00	27 Jan 2018 04:03	500
HS18010597-08	17SS91-7.5-9.5	12 Jan 2018 10:40		21 Jan 2018 17:00	25 Jan 2018 21:09	1
HS18010597-09	17SS91-10.0-12.0	12 Jan 2018 10:43		21 Jan 2018 17:00	25 Jan 2018 22:57	1
HS18010597-10	17SB29A-2.5-3.0	12 Jan 2018 10:52		21 Jan 2018 17:00	27 Jan 2018 04:39	10
HS18010597-10	17SB29A-2.5-3.0	12 Jan 2018 10:52		21 Jan 2018 17:00	25 Jan 2018 23:33	1
HS18010597-11	17SB29A-3.5-5	12 Jan 2018 10:54		21 Jan 2018 17:00	27 Jan 2018 05:15	5
HS18010597-11	17SB29A-3.5-5	12 Jan 2018 10:54		21 Jan 2018 17:00	26 Jan 2018 00:08	1
HS18010597-12	17SB29A-5.5-7.0	12 Jan 2018 10:56		21 Jan 2018 17:00	26 Jan 2018 00:44	1
HS18010597-13	17SB03A-7.5-9.5	12 Jan 2018 11:06		21 Jan 2018 17:00	26 Jan 2018 01:20	1
HS18010597-14	17SS03A-10.0-12.0	12 Jan 2018 11:08		21 Jan 2018 17:00	26 Jan 2018 01:56	1
HS18010597-15	17SB03A-12.5-14.5	12 Jan 2018 11:10		21 Jan 2018 17:00	26 Jan 2018 02:32	1
HS18010597-16	17SS88-0.0-2.0	12 Jan 2018 11:20		21 Jan 2018 17:00	26 Jan 2018 03:08	1
HS18010597-17	17SS88-2.5-4.5	12 Jan 2018 11:22		21 Jan 2018 17:00	26 Jan 2018 03:44	1
HS18010597-18	17SS88-5.0-7.0	12 Jan 2018 11:24		21 Jan 2018 17:00	26 Jan 2018 04:20	1
HS18010597-19	17SS88-7.5-9.5	12 Jan 2018 11:26		21 Jan 2018 17:00	26 Jan 2018 06:07	1
Batch ID 124532 Test Name : EXPLOSIVES BY SW8330B Matrix: Soil						
HS18010597-29	17SS90-2.5-4.5	12 Jan 2018 13:02		22 Jan 2018 17:55	27 Jan 2018 08:14	1
HS18010597-30	17SS90-5.0-7.0	12 Jan 2018 13:04		22 Jan 2018 17:55	27 Jan 2018 08:50	1
HS18010597-31	17SS90-7.5-9.5	12 Jan 2018 13:06		22 Jan 2018 17:55	27 Jan 2018 09:26	1
HS18010597-32	17SS90-10.0-12.0	12 Jan 2018 13:08		22 Jan 2018 17:55	27 Jan 2018 10:02	1

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010597

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID	R309521	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010597-01	17SS121-5.0-70	12 Jan 2018 09:50			24 Jan 2018 10:47	1
HS18010597-02	17SS121-0.0-2.0FD	12 Jan 2018 09:46			24 Jan 2018 10:47	1
HS18010597-03	17SS121-2.5-4.5-FD	12 Jan 2018 09:48			24 Jan 2018 10:47	1
HS18010597-04	17SS121-5.0-7.0-FD	12 Jan 2018 09:50			24 Jan 2018 10:47	1
HS18010597-05	17SS91-0.0-2.0	12 Jan 2018 10:34			24 Jan 2018 10:47	1
HS18010597-06	17SS91-2.5-4.5	12 Jan 2018 10:36			24 Jan 2018 10:47	1
HS18010597-07	17SS91-5.0-7.0	12 Jan 2018 10:37			24 Jan 2018 10:47	1
HS18010597-08	17SS91-7.5-9.5	12 Jan 2018 10:40			24 Jan 2018 10:47	1
HS18010597-09	17SS91-10.0-12.0	12 Jan 2018 10:43			24 Jan 2018 10:47	1
HS18010597-10	17SB29A-2.5-3.0	12 Jan 2018 10:52			24 Jan 2018 10:47	1
HS18010597-11	17SB29A-3.5-5	12 Jan 2018 10:54			24 Jan 2018 10:47	1
HS18010597-12	17SB29A-5.5-7.0	12 Jan 2018 10:56			24 Jan 2018 10:47	1
HS18010597-13	17SB03A-7.5-9.5	12 Jan 2018 11:06			24 Jan 2018 10:47	1
HS18010597-14	17SS03A-10.0-12.0	12 Jan 2018 11:08			24 Jan 2018 10:47	1
HS18010597-15	17SB03A-12.5-14.5	12 Jan 2018 11:10			24 Jan 2018 10:47	1
HS18010597-16	17SS88-0.0-2.0	12 Jan 2018 11:20			24 Jan 2018 10:47	1
HS18010597-17	17SS88-2.5-4.5	12 Jan 2018 11:22			24 Jan 2018 10:47	1
HS18010597-18	17SS88-5.0-7.0	12 Jan 2018 11:24			24 Jan 2018 10:47	1
HS18010597-19	17SS88-7.5-9.5	12 Jan 2018 11:26			24 Jan 2018 10:47	1
Batch ID	R309522	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010597-20	17SS88-10.0-12.0	12 Jan 2018 11:28			24 Jan 2018 13:17	1
HS18010597-21	17SS89-0.0-2.0	12 Jan 2018 11:35			24 Jan 2018 13:17	1
HS18010597-22	17SS89-2.5-4.5	12 Jan 2018 11:37			24 Jan 2018 13:17	1
HS18010597-23	17SS89-5.0-7.0	12 Jan 2018 11:39			24 Jan 2018 13:17	1
HS18010597-24	17SS89-7.5-9.5	12 Jan 2018 11:41			24 Jan 2018 13:17	1
HS18010597-25	17SS89-10.0-12.0	12 Jan 2018 11:43			24 Jan 2018 13:17	1
HS18010597-26	17SS25A-2.5-4.5	12 Jan 2018 11:47			24 Jan 2018 13:17	1
HS18010597-27	17SS25A-5.0-7.0	12 Jan 2018 11:49			24 Jan 2018 13:17	1
HS18010597-28	17SS90-0.0-2.0	12 Jan 2018 13:00			24 Jan 2018 13:17	1
HS18010597-29	17SS90-2.5-4.5	12 Jan 2018 13:02			24 Jan 2018 13:17	1
HS18010597-30	17SS90-5.0-7.0	12 Jan 2018 13:04			24 Jan 2018 13:17	1
HS18010597-31	17SS90-7.5-9.5	12 Jan 2018 13:06			24 Jan 2018 13:17	1
HS18010597-32	17SS90-10.0-12.0	12 Jan 2018 13:08			24 Jan 2018 13:17	1

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010597

QC BATCH REPORT

Batch ID: 124491		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124491	Units: ug/Kg		Analysis Date: 24-Jan-2018 21:24					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4404133		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD Limit Qual	
2,4,6-Trinitrotoluene	25.0	60.0							
2,4-Dinitrotoluene	25.0	60.0							
2,6-Dinitrotoluene	25.0	60.0							
Surr: 1,2-Dinitrobenzene	901.1	60.0	1250	0	72.1	50 - 150			

LCS	Sample ID: LCS-124491	Units: ug/Kg		Analysis Date: 24-Jan-2018 22:00					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4404134		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD Limit Qual	
2,4,6-Trinitrotoluene	1032	60.0	1250	0	82.6	75 - 125			
2,4-Dinitrotoluene	1192	60.0	1250	0	95.4	82 - 123			
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119			
Surr: 1,2-Dinitrobenzene	918.9	60.0	1250	0	73.5	50 - 150			

MS	Sample ID: HS18010605-23MS	Units: ug/Kg		Analysis Date: 25-Jan-2018 13:23					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4405494		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD Limit Qual	
2,4,6-Trinitrotoluene	1097	59.7	1244	0	88.2	75 - 125			
2,4-Dinitrotoluene	1239	59.7	1244	0	99.6	82 - 123			
2,6-Dinitrotoluene	1296	59.7	1244	0	104	86 - 119			
Surr: 1,2-Dinitrobenzene	908.8	59.7	1244	0	73.1	50 - 150			

MSD	Sample ID: HS18010605-23MSD	Units: ug/Kg		Analysis Date: 25-Jan-2018 13:59					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4405495		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD Limit Qual	
2,4,6-Trinitrotoluene	1084	59.1	1232	0	88.0	75 - 125	1097	1.23	30
2,4-Dinitrotoluene	1172	59.1	1232	0	95.2	82 - 123	1239	5.55	30
2,6-Dinitrotoluene	1142	59.1	1232	0	92.7	86 - 119	1296	12.6	30
Surr: 1,2-Dinitrobenzene	897.1	59.1	1232	0	72.8	50 - 150	908.8	1.29	30

The following samples were analyzed in this batch:		HS18010597-20	HS18010597-21	HS18010597-22	HS18010597-23
		HS18010597-24	HS18010597-25	HS18010597-26	HS18010597-27
		HS18010597-28			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010597

QC BATCH REPORT

Batch ID: 124492		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124492	Units: ug/Kg		Analysis Date: 25-Jan-2018 15:47					
Client ID:	Run ID: HPLC3_309676	SeqNo: 4408067		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>905</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>72.4</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124492	Units: ug/Kg		Analysis Date: 25-Jan-2018 16:22					
Client ID:	Run ID: HPLC3_309676	SeqNo: 4408068		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1037	60.0	1250	0	83.0	75 - 125			
2,4-Dinitrotoluene	1195	60.0	1250	0	95.6	82 - 123			
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>917.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.4</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010605-22MS	Units: ug/Kg		Analysis Date: 26-Jan-2018 07:19					
Client ID:	Run ID: HPLC3_309676	SeqNo: 4408092		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	2068	58.3	1214	384.1	139	75 - 125			S
2,4-Dinitrotoluene	7937	58.3	1214	630.7	602	82 - 123			S
2,6-Dinitrotoluene	3196	58.3	1214	222.7	245	86 - 119			S
<i>Surr: 1,2-Dinitrobenzene</i>	<i>926.1</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>76.3</i>	<i>50 - 150</i>			

MSD	Sample ID: HS18010605-22MSD	Units: ug/Kg		Analysis Date: 26-Jan-2018 07:55					
Client ID:	Run ID: HPLC3_309676	SeqNo: 4408093		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	2089	58.8	1225	384.1	139	75 - 125	2068	1.04	30 S
2,4-Dinitrotoluene	8020	58.8	1225	630.7	603	82 - 123	7937	1.04	30 S
2,6-Dinitrotoluene	3230	58.8	1225	222.7	245	86 - 119	3196	1.05	30 S
<i>Surr: 1,2-Dinitrobenzene</i>	<i>930.3</i>	<i>58.8</i>	<i>1225</i>	<i>0</i>	<i>75.9</i>	<i>50 - 150</i>	<i>926.1</i>	<i>0.45</i>	<i>30</i>

The following samples were analyzed in this batch:

HS18010597-01	HS18010597-02	HS18010597-03	HS18010597-04
HS18010597-05	HS18010597-06	HS18010597-07	HS18010597-08
HS18010597-09	HS18010597-10	HS18010597-11	HS18010597-12
HS18010597-13	HS18010597-14	HS18010597-15	HS18010597-16
HS18010597-17	HS18010597-18	HS18010597-19	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010597

QC BATCH REPORT

Batch ID: 124532		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124532	Units: ug/Kg		Analysis Date: 27-Jan-2018 07:03					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408381		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>918.3</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.5</i>	<i>50 - 150</i>			
LCS	Sample ID: LCS-124532	Units: ug/Kg		Analysis Date: 27-Jan-2018 07:38					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408382		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1039	60.0	1250	0	83.1	75 - 125			
2,4-Dinitrotoluene	1205	60.0	1250	0	96.4	82 - 123			
2,6-Dinitrotoluene	1190	60.0	1250	0	95.2	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>932.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>74.6</i>	<i>50 - 150</i>			
MS	Sample ID: HS18010610-02MS	Units: ug/Kg		Analysis Date: 27-Jan-2018 19:18					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408397		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1042	58.3	1214	0	85.9	75 - 125			
2,4-Dinitrotoluene	1151	58.3	1214	0	94.9	82 - 123			
2,6-Dinitrotoluene	1130	58.3	1214	0	93.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>921.3</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>75.9</i>	<i>50 - 150</i>			
MSD	Sample ID: HS18010610-02MSD	Units: ug/Kg		Analysis Date: 27-Jan-2018 19:54					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408398		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1058	59.1	1232	0	85.9	75 - 125	1042	1.47	30
2,4-Dinitrotoluene	1186	59.1	1232	0	96.3	82 - 123	1151	2.93	30
2,6-Dinitrotoluene	1161	59.1	1232	0	94.3	86 - 119	1130	2.72	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>936</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>76.0</i>	<i>50 - 150</i>	<i>921.3</i>	<i>1.58</i>	<i>30</i>
The following samples were analyzed in this batch:									
HS18010597-29		HS18010597-30		HS18010597-31		HS18010597-32			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010597

QC BATCH REPORT

Batch ID: R309521		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010884-01DUP	Units: wt%		Analysis Date: 24-Jan-2018 10:47	
Client ID:	Run ID: Balance1_309521	SeqNo: 4404642		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	20.2	0.0100			20.3 0.494 20

The following samples were analyzed in this batch:

HS18010597-01	HS18010597-02	HS18010597-03	HS18010597-04
HS18010597-05	HS18010597-06	HS18010597-07	HS18010597-08
HS18010597-09	HS18010597-10	HS18010597-11	HS18010597-12
HS18010597-13	HS18010597-14	HS18010597-15	HS18010597-16
HS18010597-17	HS18010597-18	HS18010597-19	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010597

QC BATCH REPORT

Batch ID: R309522		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010597-32DUP	Units: wt%		Analysis Date: 24-Jan-2018 13:17	
Client ID: 17SS90-10.0-12.0	Run ID: Balance1_309522		SeqNo: 4404675	PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	20.3	0.0100			21 3.39 20

The following samples were analyzed in this batch:

HS18010597-20	HS18010597-21	HS18010597-22	HS18010597-23
HS18010597-24	HS18010597-25	HS18010597-26	HS18010597-27
HS18010597-28	HS18010597-29	HS18010597-30	HS18010597-31
HS18010597-32			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 10-Apr-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010597

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018

Date: 10-Apr-18

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS18010597

Date/Time Received: **15-Jan-2018 09:15**
 Received by: **JRM**

Checklist completed by: Paresh M. Giga 16-Jan-2018 Reviewed by: RJ Modashia 17-Jan-2018
 eSignature Date eSignature Date

Matrices: **Soil**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.7c/0.2c;0.6c/0.1c;0.9c/0.4c;0.7c/0.2c U/C IR11
 Cooler(s)/Kit(s): 42760;24765;23880;3333
 Date/Time sample(s) sent to storage: 1/16/17 14:00

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:

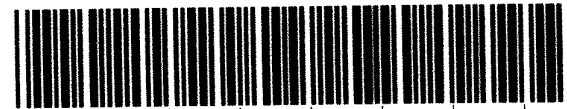
APTIM		Page 3 of 3											
COC ID:		17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:			
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP					Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com		
Project Number	501032					Lab Contact	Sonia West						
	LHAAP-17					Email	Sonia.West@alsglobal.com			Email Report To	Sharon.Pennington@CBIFederalServices.com		
Address	1203-B East Grand Avenue					Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Sharon Pennington		
	PMB 202									Address	2410 Cherahala Blvd.		
City	Marshall	State	TX			City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA			Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264					Phone Number	281.575.2132 or 281.530.5656						
Project Manager	Praveen Srivastav									Shipping Company	FedEx		
SAMPLE DETAILS									ANALYSIS REQUESTED				
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330				
17SS121-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	0950	1	X				
17SS121-0.0-2.0-FD	LHAAP-17	0	2	FT	SO	1/12/2018	0946	1	X				
17SS121-2.5-4.5-FD	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	0948	1	X				
17SS121-5.0-7.0-FD	LHAAP-17	5	7	FT	SO	1/12/2018	0950	1	X				
17SS91-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1034	1	X				
17SS91-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1036	1	X				
17SS91-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1037	1	X				
17SS91-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1040	1	X				
17SS91-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1043	1	X				
17SB29A-2.5-3.0	LHAAP-17	2.5	3	FT	SO	1/12/2018	1052	1	X				
17SB29A-3.5-5	LHAAP-17	3.5	3.5	FT	SO	1/12/2018	1054	1	X				
17SB29A-5.5-7.0	LHAAP-17	5.5	7	FT	SO	1/12/2018	1056	1	X				
17SB03A-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1106	1	X				
17SB03A-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1108	1	X				
17SB03A-12.5-14.5	LHAAP-17	12.5	14.5	FT	SO	1/12/2018	1110	1	X				
17SS88-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1120	1	X				
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS						RELINQUISHED BY/AFFILIATION		DATE/TIME	ACCEPTED BY/AFFILIATION		DATE/TIME		
						DAVID ROWAN		1/12/18	Jm. CK		1.15.18 09:15		
						DNR		1/12/18					

HS18010597
 Aptim Environmental & Infrastructure, Inc.
 Longhorn Army Ammunition Plant



APTIM		Page ⁴ / ₈ of 8									
COC ID:		17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:	
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO	
Facility Name		Longhorn AAP				Lab Name		ALS Laboratories		Email Invoice To	
Project Number		501032				Lab Contact		Sonia West		FedInvoices@CBIFederalServices.com	
Address		LHAAP-17				Email		Sonia.West@alsglobal.com		Email Report To	
1203-B East Grand Avenue		PMB 202				Address		10450 Stancliff Rd., Suite 210		Sharon.Pennington@CBIFederalServices.com	
City		Marshall		State		TX		City		Knoxville	
Postal Code		75670		Country		USA		Postal Code		37932	
Phone Number		713.243.7264				Phone Number		281.575.2132 or 281.530.5656			
Project Manager		Praveen Srivastav				Shipping Company		FedEx			
SAMPLE DETAILS						ANALYSIS REQUESTED					
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS		
17SS88-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1122	1	2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330	X	
17SS88-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1124	1	X		
17SS88-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1126	1	X		
17SS88-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1128	1	X		
17SS89-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1135	1	X		
17SS89-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1137	1	X		
17SS89-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1139	1	X		
17SS89-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1141	1	X		
17SS89-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1143	1	X		
17SB25A-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1147	1	X		
17SB25A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1149	1	X		
17SS90-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1300	1	X		
17SS90-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1302	1	X		
17SS90-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1304	1	X		
17SS90-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1306	1	X		
17SS90-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1308	1	X		
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS						RELINQUISHED BY/AFFILIATION		DATE/TIME	ACCEPTED BY/AFFILIATION		DATE/TIME
						David Roman		1/12/18	J.m		1.15.18 09:15.
						D-2		1/12/18			

HS18010597
 Aptim Environmental & Infrastructure, Inc.
 Longhorn Army Ammunition Plant



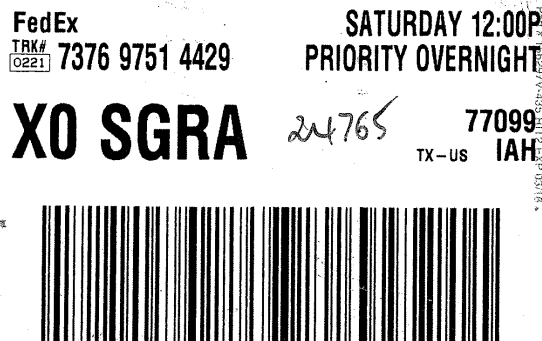
CUSTODY SEAL *SM*
 01/15/18
 DATE: 1/12/18
 Signature: *SM*
42760 LIAAP

42760 JAN 15 2018



CUSTODY SEAL *SM*
 01/15/18
 DATE: 1/12/18
 Signature: *SM*
24765 LHAAP

24765 JAN 15 2018

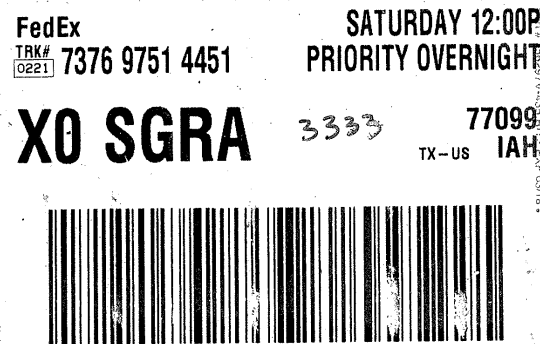


CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *DN*
23880 LHAAP

23880 JAN 15 2018



CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *DN*
3333 JAN 15 2018
3333 LHAAP





10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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February 02, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010605**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 26 sample(s) on Jan 15, 2018 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: Dayna.Fisher
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010605

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010605-01	17SS90-0.0-2.0-FD	Soil		12-Jan-2018 13:00	15-Jan-2018 09:15	☐
HS18010605-02	17SS90-2.5-4.5-FD	Soil		12-Jan-2018 13:02	15-Jan-2018 09:15	☐
HS18010605-03	17SS90-5.0-7.0-FD	Soil		12-Jan-2018 13:04	15-Jan-2018 09:15	☐
HS18010605-04	17SS90-7.5-9.5-FD	Soil		12-Jan-2018 13:06	15-Jan-2018 09:15	☐
HS18010605-05	17SS90-10.0-12.0-FD	Soil		12-Jan-2018 13:08	15-Jan-2018 09:15	☐
HS18010605-06	17SS93-0.0-2.0	Soil		12-Jan-2018 13:28	15-Jan-2018 09:15	☐
HS18010605-07	17SS93-2.5-4.5	Soil		12-Jan-2018 13:30	15-Jan-2018 09:15	☐
HS18010605-08	17SS93-5.0-7.0	Soil		12-Jan-2018 13:32	15-Jan-2018 09:15	☐
HS18010605-09	17SB04A-2.5-4.5	Soil		12-Jan-2018 13:36	15-Jan-2018 09:15	☐
HS18010605-10	17SB04A-5.0-7.0	Soil		12-Jan-2018 13:38	15-Jan-2018 09:15	☐
HS18010605-11	17SB04A-7.5-9.5	Soil		12-Jan-2018 13:40	15-Jan-2018 09:15	☐
HS18010605-12	17SB04A-10.0-12.0	Soil		12-Jan-2018 13:42	15-Jan-2018 09:15	☐
HS18010605-13	17SS92-0.0-2.0	Soil		12-Jan-2018 13:56	15-Jan-2018 09:15	☐
HS18010605-14	17SS92-2.5-4.5	Soil		12-Jan-2018 13:58	15-Jan-2018 09:15	☐
HS18010605-15	17SS92-5.0-7.0	Soil		12-Jan-2018 14:00	15-Jan-2018 09:15	☐
HS18010605-16	17SS94-0.0-2.0	Soil		12-Jan-2018 14:05	15-Jan-2018 09:15	☐
HS18010605-17	17SS94-2.5-4.5	Soil		12-Jan-2018 14:07	15-Jan-2018 09:15	☐
HS18010605-18	17SS94-5.0-7.0	Soil		12-Jan-2018 14:09	15-Jan-2018 09:15	☐
HS18010605-19	17SS99-0.0-2.0	Soil		12-Jan-2018 14:15	15-Jan-2018 09:15	☐
HS18010605-20	17SS99-2.5-4.5	Soil		12-Jan-2018 14:17	15-Jan-2018 09:15	☐
HS18010605-21	17SS99-5.0-7.0	Soil		12-Jan-2018 14:19	15-Jan-2018 09:15	☐
HS18010605-22	COE17-14A-0.0-2.0	Soil		12-Jan-2018 14:25	15-Jan-2018 09:15	☐
HS18010605-23	COE17-14A-2.5-4.5	Soil		12-Jan-2018 14:27	15-Jan-2018 09:15	☐
HS18010605-24	COE17-14A-5.0-7.0	Soil		12-Jan-2018 14:30	15-Jan-2018 09:15	☐
HS18010605-25	17SS101-0.0-2.0	Soil		12-Jan-2018 14:36	15-Jan-2018 09:15	☐
HS18010605-26	17SS101-2.5-4.5	Soil		12-Jan-2018 14:38	15-Jan-2018 09:15	☐

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010605

CASE NARRATIVE

HPLC by Method SW8330**Batch ID: 124492****Sample ID: COE17-14A-0.0-2.0 (HS18010605-22MS)**

- The recovery of the Matrix Spike (MS) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS may be due to sample matrix interference.

Sample ID: COE17-14A-0.0-2.0 (HS18010605-22MSD)

- The recovery of the Matrix Spike Duplicate (MSD) associated to this analyte was outside of the established control limits. However, the LCS was within control limits. The failed recovery of the MSD may be due to sample matrix interference.

Batch ID: 124491,124531,124532

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216**Batch ID: R309524,R309525**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-0.0-2.0-FD
 Collection Date: 12-Jan-2018 13:00

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.2	U	5.79	29.2	70.1	ug/Kg-dry	1	26-Jan-2018 09:42
2,4-Dinitrotoluene	29.2	U	5.19	29.2	70.1	ug/Kg-dry	1	26-Jan-2018 09:42
2,6-Dinitrotoluene	29.2	U	12.6	29.2	70.1	ug/Kg-dry	1	26-Jan-2018 09:42
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 09:42</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-2.5-4.5-FD
 Collection Date: 12-Jan-2018 13:02

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.4	U	6.22	31.4	75.3	ug/Kg-dry	1	26-Jan-2018 10:18
2,4-Dinitrotoluene	31.4	U	5.57	31.4	75.3	ug/Kg-dry	1	26-Jan-2018 10:18
2,6-Dinitrotoluene	31.4	U	13.5	31.4	75.3	ug/Kg-dry	1	26-Jan-2018 10:18
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	26-Jan-2018 10:18
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-5.0-7.0-FD
 Collection Date: 12-Jan-2018 13:04

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-03
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.4	U	6.23	31.4	75.3	ug/Kg-dry	1	26-Jan-2018 10:54
2,4-Dinitrotoluene	31.4	U	5.57	31.4	75.3	ug/Kg-dry	1	26-Jan-2018 10:54
2,6-Dinitrotoluene	31.4	U	13.6	31.4	75.3	ug/Kg-dry	1	26-Jan-2018 10:54
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.8</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 10:54</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.5		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-7.5-9.5-FD
 Collection Date: 12-Jan-2018 13:06

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-04
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.4	U	6.04	30.4	73.0	ug/Kg-dry	1	26-Jan-2018 11:30
2,4-Dinitrotoluene	30.4	U	5.41	30.4	73.0	ug/Kg-dry	1	26-Jan-2018 11:30
2,6-Dinitrotoluene	30.4	U	13.1	30.4	73.0	ug/Kg-dry	1	26-Jan-2018 11:30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 11:30</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS90-10.0-12.0-FD
 Collection Date: 12-Jan-2018 13:08

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-05
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.5	U	5.84	29.5	70.7	ug/Kg-dry	1	26-Jan-2018 13:18
2,4-Dinitrotoluene	29.5	U	5.23	29.5	70.7	ug/Kg-dry	1	26-Jan-2018 13:18
2,6-Dinitrotoluene	29.5	U	12.7	29.5	70.7	ug/Kg-dry	1	26-Jan-2018 13:18
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	26-Jan-2018 13:18
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS93-0.0-2.0
 Collection Date: 12-Jan-2018 13:28

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-06
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	179		5.83	29.4	70.6	ug/Kg-dry	1	26-Jan-2018 13:53
2,4-Dinitrotoluene	263		5.22	29.4	70.6	ug/Kg-dry	1	26-Jan-2018 13:53
2,6-Dinitrotoluene	29.4	U	12.7	29.4	70.6	ug/Kg-dry	1	26-Jan-2018 13:53
Surr: 1,2-Dinitrobenzene	71.1			0	50-150	%REC	1	26-Jan-2018 13:53
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS93-2.5-4.5
 Collection Date: 12-Jan-2018 13:30

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-07
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.9	U	5.92	29.9	71.6	ug/Kg-dry	1	26-Jan-2018 14:29
2,4-Dinitrotoluene	29.9	U	5.30	29.9	71.6	ug/Kg-dry	1	26-Jan-2018 14:29
2,6-Dinitrotoluene	29.9	U	12.9	29.9	71.6	ug/Kg-dry	1	26-Jan-2018 14:29
<i>Surr: 1,2-Dinitrobenzene</i>	73.9			0	50-150	%REC	1	26-Jan-2018 14:29
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS93-5.0-7.0
 Collection Date: 12-Jan-2018 13:32

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-08
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.6	U	6.06	30.6	73.3	ug/Kg-dry	1	26-Jan-2018 15:05
2,4-Dinitrotoluene	30.6	U	5.43	30.6	73.3	ug/Kg-dry	1	26-Jan-2018 15:05
2,6-Dinitrotoluene	30.6	U	13.2	30.6	73.3	ug/Kg-dry	1	26-Jan-2018 15:05
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 15:05</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB04A-2.5-4.5
 Collection Date: 12-Jan-2018 13:36

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-09
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.1	U	5.98	30.1	72.4	ug/Kg-dry	1	26-Jan-2018 15:41
2,4-Dinitrotoluene	30.1	U	5.35	30.1	72.4	ug/Kg-dry	1	26-Jan-2018 15:41
2,6-Dinitrotoluene	30.1	U	13.0	30.1	72.4	ug/Kg-dry	1	26-Jan-2018 15:41
<i>Surr: 1,2-Dinitrobenzene</i>	73.8			0	50-150	%REC	1	26-Jan-2018 15:41
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB04A-5.0-7.0
 Collection Date: 12-Jan-2018 13:38

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-10
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.7	U	5.90	29.7	71.4	ug/Kg-dry	1	26-Jan-2018 16:17
2,4-Dinitrotoluene	29.7	U	5.28	29.7	71.4	ug/Kg-dry	1	26-Jan-2018 16:17
2,6-Dinitrotoluene	29.7	U	12.8	29.7	71.4	ug/Kg-dry	1	26-Jan-2018 16:17
<i>Surr: 1,2-Dinitrobenzene</i>	73.4			0	50-150	%REC	1	26-Jan-2018 16:17
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB04A-7.5-9.5
 Collection Date: 12-Jan-2018 13:40

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-11
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.5	U	6.05	30.5	73.2	ug/Kg-dry	1	26-Jan-2018 16:53
2,4-Dinitrotoluene	135		5.41	30.5	73.2	ug/Kg-dry	1	26-Jan-2018 16:53
2,6-Dinitrotoluene	30.5	U	13.2	30.5	73.2	ug/Kg-dry	1	26-Jan-2018 16:53
<i>Surr: 1,2-Dinitrobenzene</i>	<i>75.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 16:53</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	18.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB04A-10.0-12.0
 Collection Date: 12-Jan-2018 13:42

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-12
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.1	U	6.18	31.1	74.7	ug/Kg-dry	1	26-Jan-2018 17:28
2,4-Dinitrotoluene	31.1	U	5.53	31.1	74.7	ug/Kg-dry	1	26-Jan-2018 17:28
2,6-Dinitrotoluene	31.1	U	13.5	31.1	74.7	ug/Kg-dry	1	26-Jan-2018 17:28
<i>Surr: 1,2-Dinitrobenzene</i>	<i>75.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 17:28</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.9		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS92-0.0-2.0
 Collection Date: 12-Jan-2018 13:56

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-13
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.0	U	5.75	29.0	69.5	ug/Kg-dry	1	26-Jan-2018 18:04
2,4-Dinitrotoluene	29.0	U	5.14	29.0	69.5	ug/Kg-dry	1	26-Jan-2018 18:04
2,6-Dinitrotoluene	29.0	U	12.5	29.0	69.5	ug/Kg-dry	1	26-Jan-2018 18:04
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	26-Jan-2018 18:04
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS92-2.5-4.5
 Collection Date: 12-Jan-2018 13:58

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-14
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	82.5		5.78	29.1	69.9	ug/Kg-dry	1	26-Jan-2018 20:18
2,4-Dinitrotoluene	109		5.17	29.1	69.9	ug/Kg-dry	1	26-Jan-2018 20:18
2,6-Dinitrotoluene	49.8	J	12.6	29.1	69.9	ug/Kg-dry	1	26-Jan-2018 20:18
Surr: 1,2-Dinitrobenzene	74.6			0	50-150	%REC	1	26-Jan-2018 20:18
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.5		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS92-5.0-7.0
 Collection Date: 12-Jan-2018 14:00

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-15
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.1	U	5.77	29.1	69.8	ug/Kg-dry	1	26-Jan-2018 20:53
2,4-Dinitrotoluene	29.1	U	5.16	29.1	69.8	ug/Kg-dry	1	26-Jan-2018 20:53
2,6-Dinitrotoluene	29.1	U	12.6	29.1	69.8	ug/Kg-dry	1	26-Jan-2018 20:53
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 20:53</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS94-0.0-2.0
 Collection Date: 12-Jan-2018 14:05

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-16
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	70.1	J	5.92	29.8	71.6	ug/Kg-dry	1	26-Jan-2018 21:29
2,4-Dinitrotoluene	90.8		5.30	29.8	71.6	ug/Kg-dry	1	26-Jan-2018 21:29
2,6-Dinitrotoluene	62.7	J	12.9	29.8	71.6	ug/Kg-dry	1	26-Jan-2018 21:29
Surr: 1,2-Dinitrobenzene	73.9			0	50-150	%REC	1	26-Jan-2018 21:29
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS94-2.5-4.5
 Collection Date: 12-Jan-2018 14:07

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-17
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.3	U	6.02	30.3	72.8	ug/Kg-dry	1	26-Jan-2018 22:05
2,4-Dinitrotoluene	30.3	U	5.39	30.3	72.8	ug/Kg-dry	1	26-Jan-2018 22:05
2,6-Dinitrotoluene	30.3	U	13.1	30.3	72.8	ug/Kg-dry	1	26-Jan-2018 22:05
<i>Surr: 1,2-Dinitrobenzene</i>	<i>76.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 22:05</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS94-5.0-7.0
 Collection Date: 12-Jan-2018 14:09

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-18
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.9	U	5.73	28.9	69.3	ug/Kg-dry	1	26-Jan-2018 22:41
2,4-Dinitrotoluene	28.9	U	5.13	28.9	69.3	ug/Kg-dry	1	26-Jan-2018 22:41
2,6-Dinitrotoluene	28.9	U	12.5	28.9	69.3	ug/Kg-dry	1	26-Jan-2018 22:41
<i>Surr: 1,2-Dinitrobenzene</i>	73.6			0	50-150	%REC	1	26-Jan-2018 22:41
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS99-0.0-2.0
 Collection Date: 12-Jan-2018 14:15

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-19
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.6	U	6.08	30.6	73.5	ug/Kg-dry	1	26-Jan-2018 23:17
2,4-Dinitrotoluene	30.6	U	5.44	30.6	73.5	ug/Kg-dry	1	26-Jan-2018 23:17
2,6-Dinitrotoluene	30.6	U	13.2	30.6	73.5	ug/Kg-dry	1	26-Jan-2018 23:17
<i>Surr: 1,2-Dinitrobenzene</i>	<i>75.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>26-Jan-2018 23:17</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS99-2.5-4.5
 Collection Date: 12-Jan-2018 14:17

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-20
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.1	U	5.97	30.1	72.2	ug/Kg-dry	1	27-Jan-2018 10:38
2,4-Dinitrotoluene	30.1	U	5.34	30.1	72.2	ug/Kg-dry	1	27-Jan-2018 10:38
2,6-Dinitrotoluene	30.1	U	13.0	30.1	72.2	ug/Kg-dry	1	27-Jan-2018 10:38
<i>Surr: 1,2-Dinitrobenzene</i>	73.9			0	50-150	%REC	1	27-Jan-2018 10:38
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS99-5.0-7.0
 Collection Date: 12-Jan-2018 14:19

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-21
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.5	U	6.05	30.5	73.2	ug/Kg-dry	1	27-Jan-2018 13:12
2,4-Dinitrotoluene	30.5	U	5.42	30.5	73.2	ug/Kg-dry	1	27-Jan-2018 13:12
2,6-Dinitrotoluene	30.5	U	13.2	30.5	73.2	ug/Kg-dry	1	27-Jan-2018 13:12
<i>Surr: 1,2-Dinitrobenzene</i>	<i>82.5</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>27-Jan-2018 13:12</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-14A-0.0-2.0
 Collection Date: 12-Jan-2018 14:25

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-22
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	438		5.57	28.1	67.4	ug/Kg-dry	1	26-Jan-2018 06:43
2,4-Dinitrotoluene	719		4.99	28.1	67.4	ug/Kg-dry	1	26-Jan-2018 06:43
2,6-Dinitrotoluene	254		12.1	28.1	67.4	ug/Kg-dry	1	26-Jan-2018 06:43
Surr: 1,2-Dinitrobenzene	72.9			0	50-150	%REC	1	26-Jan-2018 06:43
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	12.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-14A-2.5-4.5
 Collection Date: 12-Jan-2018 14:27

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-23
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 21-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.9	U	5.54	27.9	67.0	ug/Kg-dry	1	25-Jan-2018 12:47
2,4-Dinitrotoluene	27.9	U	4.96	27.9	67.0	ug/Kg-dry	1	25-Jan-2018 12:47
2,6-Dinitrotoluene	27.9	U	12.1	27.9	67.0	ug/Kg-dry	1	25-Jan-2018 12:47
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>25-Jan-2018 12:47</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	12.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-14A-5.0-7.0
 Collection Date: 12-Jan-2018 14:30

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-24
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	6.00	30.2	72.5	ug/Kg-dry	1	26-Jan-2018 23:53
2,4-Dinitrotoluene	30.2	U	5.37	30.2	72.5	ug/Kg-dry	1	26-Jan-2018 23:53
2,6-Dinitrotoluene	30.2	U	13.1	30.2	72.5	ug/Kg-dry	1	26-Jan-2018 23:53
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	26-Jan-2018 23:53
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS101-0.0-2.0
 Collection Date: 12-Jan-2018 14:36

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-25
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.5	U	5.85	29.5	70.7	ug/Kg-dry	1	27-Jan-2018 13:48
2,4-Dinitrotoluene	29.5	U	5.23	29.5	70.7	ug/Kg-dry	1	27-Jan-2018 13:48
2,6-Dinitrotoluene	29.5	U	12.7	29.5	70.7	ug/Kg-dry	1	27-Jan-2018 13:48
<i>Surr: 1,2-Dinitrobenzene</i>	86.8			0	50-150	%REC	1	27-Jan-2018 13:48
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS101-2.5-4.5
 Collection Date: 12-Jan-2018 14:38

ANALYTICAL REPORT

WorkOrder:HS18010605
 Lab ID:HS18010605-26
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.1	U	6.37	32.1	77.0	ug/Kg-dry	1	27-Jan-2018 14:24
2,4-Dinitrotoluene	32.1	U	5.70	32.1	77.0	ug/Kg-dry	1	27-Jan-2018 14:24
2,6-Dinitrotoluene	32.1	U	13.9	32.1	77.0	ug/Kg-dry	1	27-Jan-2018 14:24
<i>Surr: 1,2-Dinitrobenzene</i>	85.9			0	50-150	%REC	1	27-Jan-2018 14:24
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.1		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010605**Batch ID:** 124491 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010605-23	1	2.04	10 (mL)	4.902
HS18010605-23	1	2.04	10 (mL)	4902

Batch ID: 124492 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010605-22	1	2.03	10 (mL)	4.926

Batch ID: 124531 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010605-01	1	2.01	10 (mL)	4.975
HS18010605-02	1	2.06	10 (mL)	4.854
HS18010605-03	1	2.03	10 (mL)	4.926
HS18010605-04	1	2.09	10 (mL)	4.785
HS18010605-05	1	2.07	10 (mL)	4.831
HS18010605-06	1	2.02	10 (mL)	4.95
HS18010605-07	1	2.05	10 (mL)	4.878
HS18010605-08	1	2.09	10 (mL)	4.785
HS18010605-09	1	2.04	10 (mL)	4.902
HS18010605-10	1	2.11	10 (mL)	4.739
HS18010605-11	1	2.01	10 (mL)	4.975
HS18010605-12	1	2.03	10 (mL)	4.926
HS18010605-13	1	2.05	10 (mL)	4.878
HS18010605-14	1	2.08	10 (mL)	4.808
HS18010605-15	1	2.03	10 (mL)	4.926
HS18010605-16	1	2.01	10 (mL)	4.975
HS18010605-17	1	2	10 (mL)	5
HS18010605-18	1	2.07	10 (mL)	4.831
HS18010605-19	1	2.01	10 (mL)	4.975
HS18010605-24	1	2.05	10 (mL)	4.878

Batch ID: 124532 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010605-20	1	2.06	10 (mL)	4.854
HS18010605-21	1	2.09	10 (mL)	4.785
HS18010605-25	1	2.03	10 (mL)	4.926
HS18010605-26	1	2	10 (mL)	5

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124491	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010605-23	COE17-14A-2.5-4.5	12 Jan 2018 14:27		21 Jan 2018 17:00	25 Jan 2018 12:47	1
Batch ID 124492	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010605-22	COE17-14A-0.0-2.0	12 Jan 2018 14:25		21 Jan 2018 17:00	26 Jan 2018 06:43	1
Batch ID 124531	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010605-01	17SS90-0.0-2.0-FD	12 Jan 2018 13:00		22 Jan 2018 17:52	26 Jan 2018 09:42	1
HS18010605-02	17SS90-2.5-4.5-FD	12 Jan 2018 13:02		22 Jan 2018 17:52	26 Jan 2018 10:18	1
HS18010605-03	17SS90-5.0-7.0-FD	12 Jan 2018 13:04		22 Jan 2018 17:52	26 Jan 2018 10:54	1
HS18010605-04	17SS90-7.5-9.5-FD	12 Jan 2018 13:06		22 Jan 2018 17:52	26 Jan 2018 11:30	1
HS18010605-05	17SS90-10.0-12.0-FD	12 Jan 2018 13:08		22 Jan 2018 17:52	26 Jan 2018 13:18	1
HS18010605-06	17SS93-0.0-2.0	12 Jan 2018 13:28		22 Jan 2018 17:52	26 Jan 2018 13:53	1
HS18010605-07	17SS93-2.5-4.5	12 Jan 2018 13:30		22 Jan 2018 17:52	26 Jan 2018 14:29	1
HS18010605-08	17SS93-5.0-7.0	12 Jan 2018 13:32		22 Jan 2018 17:52	26 Jan 2018 15:05	1
HS18010605-09	17SB04A-2.5-4.5	12 Jan 2018 13:36		22 Jan 2018 17:52	26 Jan 2018 15:41	1
HS18010605-10	17SB04A-5.0-7.0	12 Jan 2018 13:38		22 Jan 2018 17:52	26 Jan 2018 16:17	1
HS18010605-11	17SB04A-7.5-9.5	12 Jan 2018 13:40		22 Jan 2018 17:52	26 Jan 2018 16:53	1
HS18010605-12	17SB04A-10.0-12.0	12 Jan 2018 13:42		22 Jan 2018 17:52	26 Jan 2018 17:28	1
HS18010605-13	17SS92-0.0-2.0	12 Jan 2018 13:56		22 Jan 2018 17:52	26 Jan 2018 18:04	1
HS18010605-14	17SS92-2.5-4.5	12 Jan 2018 13:58		22 Jan 2018 17:52	26 Jan 2018 20:18	1
HS18010605-15	17SS92-5.0-7.0	12 Jan 2018 14:00		22 Jan 2018 17:52	26 Jan 2018 20:53	1
HS18010605-16	17SS94-0.0-2.0	12 Jan 2018 14:05		22 Jan 2018 17:52	26 Jan 2018 21:29	1
HS18010605-17	17SS94-2.5-4.5	12 Jan 2018 14:07		22 Jan 2018 17:52	26 Jan 2018 22:05	1
HS18010605-18	17SS94-5.0-7.0	12 Jan 2018 14:09		22 Jan 2018 17:52	26 Jan 2018 22:41	1
HS18010605-19	17SS99-0.0-2.0	12 Jan 2018 14:15		22 Jan 2018 17:52	26 Jan 2018 23:17	1
HS18010605-24	COE17-14A-5.0-7.0	12 Jan 2018 14:30		22 Jan 2018 17:52	26 Jan 2018 23:53	1
Batch ID 124532	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010605-20	17SS99-2.5-4.5	12 Jan 2018 14:17		22 Jan 2018 17:55	27 Jan 2018 10:38	1
HS18010605-21	17SS99-5.0-7.0	12 Jan 2018 14:19		22 Jan 2018 17:55	27 Jan 2018 13:12	1
HS18010605-25	17SS101-0.0-2.0	12 Jan 2018 14:36		22 Jan 2018 17:55	27 Jan 2018 13:48	1
HS18010605-26	17SS101-2.5-4.5	12 Jan 2018 14:38		22 Jan 2018 17:55	27 Jan 2018 14:24	1

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID	R309524	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010605-01	17SS90-0.0-2.0-FD	12 Jan 2018 13:00			24 Jan 2018 14:15	1
HS18010605-02	17SS90-2.5-4.5-FD	12 Jan 2018 13:02			24 Jan 2018 14:15	1
HS18010605-03	17SS90-5.0-7.0-FD	12 Jan 2018 13:04			24 Jan 2018 14:15	1
HS18010605-04	17SS90-7.5-9.5-FD	12 Jan 2018 13:06			24 Jan 2018 14:15	1
HS18010605-05	17SS90-10.0-12.0-FD	12 Jan 2018 13:08			24 Jan 2018 14:15	1
HS18010605-06	17SS93-0.0-2.0	12 Jan 2018 13:28			24 Jan 2018 14:15	1
HS18010605-07	17SS93-2.5-4.5	12 Jan 2018 13:30			24 Jan 2018 14:15	1
HS18010605-08	17SS93-5.0-7.0	12 Jan 2018 13:32			24 Jan 2018 14:15	1
HS18010605-09	17SB04A-2.5-4.5	12 Jan 2018 13:36			24 Jan 2018 14:15	1
HS18010605-10	17SB04A-5.0-7.0	12 Jan 2018 13:38			24 Jan 2018 14:15	1
HS18010605-11	17SB04A-7.5-9.5	12 Jan 2018 13:40			24 Jan 2018 14:15	1
HS18010605-12	17SB04A-10.0-12.0	12 Jan 2018 13:42			24 Jan 2018 14:15	1
HS18010605-13	17SS92-0.0-2.0	12 Jan 2018 13:56			24 Jan 2018 14:15	1
HS18010605-14	17SS92-2.5-4.5	12 Jan 2018 13:58			24 Jan 2018 14:15	1
HS18010605-15	17SS92-5.0-7.0	12 Jan 2018 14:00			24 Jan 2018 14:15	1
HS18010605-16	17SS94-0.0-2.0	12 Jan 2018 14:05			24 Jan 2018 14:15	1
HS18010605-17	17SS94-2.5-4.5	12 Jan 2018 14:07			24 Jan 2018 14:15	1
HS18010605-18	17SS94-5.0-7.0	12 Jan 2018 14:09			24 Jan 2018 14:15	1
HS18010605-19	17SS99-0.0-2.0	12 Jan 2018 14:15			24 Jan 2018 14:15	1
HS18010605-20	17SS99-2.5-4.5	12 Jan 2018 14:17			24 Jan 2018 14:15	1
Batch ID	R309525	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010605-21	17SS99-5.0-7.0	12 Jan 2018 14:19			24 Jan 2018 14:54	1
HS18010605-22	COE17-14A-0.0-2.0	12 Jan 2018 14:25			24 Jan 2018 14:54	1
HS18010605-23	COE17-14A-2.5-4.5	12 Jan 2018 14:27			24 Jan 2018 14:54	1
HS18010605-24	COE17-14A-5.0-7.0	12 Jan 2018 14:30			24 Jan 2018 14:54	1
HS18010605-25	17SS101-0.0-2.0	12 Jan 2018 14:36			24 Jan 2018 14:54	1
HS18010605-26	17SS101-2.5-4.5	12 Jan 2018 14:38			24 Jan 2018 14:54	1

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

QC BATCH REPORT

Batch ID: 124491		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124491	Units: ug/Kg		Analysis Date: 24-Jan-2018 21:24					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4404133		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>901.1</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>72.1</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124491	Units: ug/Kg		Analysis Date: 24-Jan-2018 22:00					
Client ID:	Run ID: HPLC3_309506	SeqNo: 4404134		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1032	60.0	1250	0	82.6	75 - 125			
2,4-Dinitrotoluene	1192	60.0	1250	0	95.4	82 - 123			
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>918.9</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.5</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010605-23MS	Units: ug/Kg		Analysis Date: 25-Jan-2018 13:23					
Client ID: COE17-14A-2.5-4.5	Run ID: HPLC3_309506	SeqNo: 4405494		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1097	59.7	1244	0	88.2	75 - 125			
2,4-Dinitrotoluene	1239	59.7	1244	0	99.6	82 - 123			
2,6-Dinitrotoluene	1296	59.7	1244	0	104	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>908.8</i>	<i>59.7</i>	<i>1244</i>	<i>0</i>	<i>73.1</i>	<i>50 - 150</i>			

MSD	Sample ID: HS18010605-23MSD	Units: ug/Kg		Analysis Date: 25-Jan-2018 13:59					
Client ID: COE17-14A-2.5-4.5	Run ID: HPLC3_309506	SeqNo: 4405495		PrepDate: 21-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1084	59.1	1232	0	88.0	75 - 125	1097	1.23	30
2,4-Dinitrotoluene	1172	59.1	1232	0	95.2	82 - 123	1239	5.55	30
2,6-Dinitrotoluene	1142	59.1	1232	0	92.7	86 - 119	1296	12.6	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>897.1</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>72.8</i>	<i>50 - 150</i>	<i>908.8</i>	<i>1.29</i>	<i>30</i>

The following samples were analyzed in this batch: HS18010605-23

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

QC BATCH REPORT

Batch ID: 124492		Instrument: HPLC3		Method: SW8330						
MBLK	Sample ID: MBLK-124492	Units: ug/Kg		Analysis Date: 25-Jan-2018 15:47						
Client ID:	Run ID: HPLC3_309676	SeqNo: 4408067		PrepDate: 21-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	25.0	60.0								U
2,4-Dinitrotoluene	25.0	60.0								U
2,6-Dinitrotoluene	25.0	60.0								U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>905</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>72.4</i>	<i>50 - 150</i>				

LCS	Sample ID: LCS-124492	Units: ug/Kg		Analysis Date: 25-Jan-2018 16:22						
Client ID:	Run ID: HPLC3_309676	SeqNo: 4408068		PrepDate: 21-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1037	60.0	1250	0	83.0	75 - 125				
2,4-Dinitrotoluene	1195	60.0	1250	0	95.6	82 - 123				
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119				
<i>Surr: 1,2-Dinitrobenzene</i>	<i>917.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.4</i>	<i>50 - 150</i>				

MS	Sample ID: HS18010605-22MS	Units: ug/Kg		Analysis Date: 26-Jan-2018 07:19						
Client ID: COE17-14A-0.0-2.0	Run ID: HPLC3_309676	SeqNo: 4408092		PrepDate: 21-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	2068	58.3	1214	384.1	139	75 - 125				S
2,4-Dinitrotoluene	7937	58.3	1214	630.7	602	82 - 123				S
2,6-Dinitrotoluene	3196	58.3	1214	222.7	245	86 - 119				S
<i>Surr: 1,2-Dinitrobenzene</i>	<i>926.1</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>76.3</i>	<i>50 - 150</i>				

MSD	Sample ID: HS18010605-22MSD	Units: ug/Kg		Analysis Date: 26-Jan-2018 07:55						
Client ID: COE17-14A-0.0-2.0	Run ID: HPLC3_309676	SeqNo: 4408093		PrepDate: 21-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	2089	58.8	1225	384.1	139	75 - 125	2068	1.04	30	S
2,4-Dinitrotoluene	8020	58.8	1225	630.7	603	82 - 123	7937	1.04	30	S
2,6-Dinitrotoluene	3230	58.8	1225	222.7	245	86 - 119	3196	1.05	30	S
<i>Surr: 1,2-Dinitrobenzene</i>	<i>930.3</i>	<i>58.8</i>	<i>1225</i>	<i>0</i>	<i>75.9</i>	<i>50 - 150</i>	<i>926.1</i>	<i>0.45</i>	<i>30</i>	

The following samples were analyzed in this batch: HS18010605-22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

QC BATCH REPORT

Batch ID: 124531		Instrument: HPLC3		Method: SW8330						
MBLK	Sample ID: MBLK-124531	Units: ug/Kg			Analysis Date: 26-Jan-2018 08:31					
Client ID:	Run ID: HPLC3_309684	SeqNo: 4408140		PrepDate: 22-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual		
2,4,6-Trinitrotoluene	25.0	60.0							U	
2,4-Dinitrotoluene	25.0	60.0							U	
2,6-Dinitrotoluene	25.0	60.0							U	
Surr: 1,2-Dinitrobenzene	905.5	60.0	1250	0	72.4	50 - 150				

LCS	Sample ID: LCS-124531	Units: ug/Kg			Analysis Date: 26-Jan-2018 09:07					
Client ID:	Run ID: HPLC3_309684	SeqNo: 4408141		PrepDate: 22-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual		
2,4,6-Trinitrotoluene	1019	60.0	1250	0	81.5	75 - 125				
2,4-Dinitrotoluene	1189	60.0	1250	0	95.1	82 - 123				
2,6-Dinitrotoluene	1164	60.0	1250	0	93.1	86 - 119				
Surr: 1,2-Dinitrobenzene	917.8	60.0	1250	0	73.4	50 - 150				

MS	Sample ID: HS18010605-24MS	Units: ug/Kg			Analysis Date: 27-Jan-2018 00:28					
Client ID: COE17-14A-5.0-7.0	Run ID: HPLC3_309684	SeqNo: 4408164		PrepDate: 22-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual		
2,4,6-Trinitrotoluene	1096	59.1	1232	0	89.0	75 - 125				
2,4-Dinitrotoluene	1186	59.1	1232	0	96.3	82 - 123				
2,6-Dinitrotoluene	1169	59.1	1232	0	94.9	86 - 119				
Surr: 1,2-Dinitrobenzene	920.1	59.1	1232	0	74.7	50 - 150				

MSD	Sample ID: HS18010605-24MSD	Units: ug/Kg			Analysis Date: 27-Jan-2018 01:04					
Client ID: COE17-14A-5.0-7.0	Run ID: HPLC3_309684	SeqNo: 4408165		PrepDate: 22-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual		
2,4,6-Trinitrotoluene	1115	59.7	1244	0	89.6	75 - 125	1096	1.71	30	
2,4-Dinitrotoluene	1184	59.7	1244	0	95.2	82 - 123	1186	0.104	30	
2,6-Dinitrotoluene	1156	59.7	1244	0	92.9	86 - 119	1169	1.09	30	
Surr: 1,2-Dinitrobenzene	925.9	59.7	1244	0	74.4	50 - 150	920.1	0.632	30	

The following samples were analyzed in this batch:

HS18010605-01	HS18010605-02	HS18010605-03	HS18010605-04
HS18010605-05	HS18010605-06	HS18010605-07	HS18010605-08
HS18010605-09	HS18010605-10	HS18010605-11	HS18010605-12
HS18010605-13	HS18010605-14	HS18010605-15	HS18010605-16
HS18010605-17	HS18010605-18	HS18010605-19	HS18010605-24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

QC BATCH REPORT

Batch ID: 124532		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124532	Units: ug/Kg		Analysis Date: 27-Jan-2018 07:03					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408381		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>918.3</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.5</i>	<i>50 - 150</i>			
LCS	Sample ID: LCS-124532	Units: ug/Kg		Analysis Date: 27-Jan-2018 07:38					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408382		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1039	60.0	1250	0	83.1	75 - 125			
2,4-Dinitrotoluene	1205	60.0	1250	0	96.4	82 - 123			
2,6-Dinitrotoluene	1190	60.0	1250	0	95.2	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>932.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>74.6</i>	<i>50 - 150</i>			
MS	Sample ID: HS18010610-02MS	Units: ug/Kg		Analysis Date: 27-Jan-2018 19:18					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408397		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1042	58.3	1214	0	85.9	75 - 125			
2,4-Dinitrotoluene	1151	58.3	1214	0	94.9	82 - 123			
2,6-Dinitrotoluene	1130	58.3	1214	0	93.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>921.3</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>75.9</i>	<i>50 - 150</i>			
MSD	Sample ID: HS18010610-02MSD	Units: ug/Kg		Analysis Date: 27-Jan-2018 19:54					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408398		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1058	59.1	1232	0	85.9	75 - 125	1042	1.47	30
2,4-Dinitrotoluene	1186	59.1	1232	0	96.3	82 - 123	1151	2.93	30
2,6-Dinitrotoluene	1161	59.1	1232	0	94.3	86 - 119	1130	2.72	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>936</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>76.0</i>	<i>50 - 150</i>	<i>921.3</i>	<i>1.58</i>	<i>30</i>
The following samples were analyzed in this batch:									
HS18010605-20		HS18010605-21		HS18010605-25		HS18010605-26			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

QC BATCH REPORT

Batch ID: R309524		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010605-20DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:15	
Client ID: 17SS99-2.5-4.5	Run ID: Balance1_309524	SeqNo: 4404711		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	18.3	0.0100			19.3 5.32 20

The following samples were analyzed in this batch:

HS18010605-01	HS18010605-02	HS18010605-03	HS18010605-04
HS18010605-05	HS18010605-06	HS18010605-07	HS18010605-08
HS18010605-09	HS18010605-10	HS18010605-11	HS18010605-12
HS18010605-13	HS18010605-14	HS18010605-15	HS18010605-16
HS18010605-17	HS18010605-18	HS18010605-19	HS18010605-20

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

QC BATCH REPORT

Batch ID: R309525		Instrument: Balance1		Method: ASTM D2216					
DUP	Sample ID: HS18010605-24DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:54					
Client ID: COE17-14A-5.0-7.0	Run ID: Balance1_309525	SeqNo: 4404747		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Percent Moisture		18.6	0.0100				19.3	3.69	20
DUP	Sample ID: HS18010605-23DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:54					
Client ID: COE17-14A-2.5-4.5	Run ID: Balance1_309525	SeqNo: 4404732		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Percent Moisture		11.4	0.0100				12.2	6.78	20
DUP	Sample ID: HS18010605-22DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:54					
Client ID: COE17-14A-0.0-2.0	Run ID: Balance1_309525	SeqNo: 4404731		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Percent Moisture		13.1	0.0100				12.3	6.3	20
The following samples were analyzed in this batch:									
HS18010605-21		HS18010605-22		HS18010605-23		HS18010605-24			
HS18010605-25		HS18010605-26							

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 02-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010605

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group USA, Corp

Date: 02-Feb-18

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS18010605

Date/Time Received: **15-Jan-2018 09:15**
 Received by: **JRM**

Checklist completed by: Paresh M. Giga 16-Jan-2018 Reviewed by: RJ Modashia 17-Jan-2018
 eSignature Date eSignature Date

Matrices: **Soil**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.7c/0.2c;0.6c/0.1c;0.9c/0.4c;0.7c/0.2c U/C IR11
 Cooler(s)/Kit(s): 42760;24765;23880;3333
 Date/Time sample(s) sent to storage: 1/16/17 14:45

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:

COC ID:		17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:										
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO										
Facility Name	Longhorn AAP					Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com									
Project Number	501032					Lab Contact	Sonia West			Email Report To	Sharon.Pennington@CBIFederalServices.com									
	LHAAP-17					Email	Sonia.West@alsglobal.com			Mail Reports To	Sharon Pennington									
Address	1203-B East Grand Avenue					Address	10450 Stancilff Rd., Suite 210			Address	2410 Cherahala Blvd.									
	PMB 202																			
City	Marshall	State	TX			City	Houston	State	TX	City	Knoxville	State	TN							
Postal Code	75670	Country	USA			Postal Code	77099	Country	USA	Postal Code	37932	Country	USA							
Phone Number	713.243.7264					Phone Number	281.575.2132 or 281.530.5656													
Project Manager	Praveen Srivastav									Shipping Company	FedEx									
SAMPLE DETAILS						ANALYSIS REQUESTED														
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330										
17SS90-0.0-2.0-FD	LHAAP-17	0	2	FT	SO	1/12/2018	1300	1	X											
17SS90-2.5-4.5-FD	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1302	1	X											
17SS90-5.0-7.0-FD	LHAAP-17	5	7	FT	SO	1/12/2018	1304	1	X											
17SS90-7.5-9.5-FD	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1306	1	X											
17SS90-10.0-12.0-FD	LHAAP-17	10	12	FT	SO	1/12/2018	1308	1	X											
17SS93-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1328	1	X											
17SS93-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1330	1	X											
17SS93-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1332	1	X											
17SB04A-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1336	1	X											
17SB04A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1338	1	X											
17SB04A-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1340	1	X											
17SB04A-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1342	1	X											
17SS92-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1356	1	X											
17SS92-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1358	1	X											
17SS92-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1400	1	X											
17SS94-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1405	1	X											
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS						RELINQUISHED BY/AFFILIATION		DATE/TIME	ACCEPTED BY/AFFILIATION		DATE/TIME									
						D. R.		1/12/18	J. A.		1.15.18 09:15									
						D. A. Roman		1/12/18												

COC ID: 17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:								
PROJECT/CLIENT INFO							LABORATORY			OTHER INFO						
Facility Name		Longhorn AAP					Lab Name		ALS Laboratories		Email Invoice To		FedInvoices@CBIFederalServices.com			
Project Number		501032					Lab Contact		Sonia West							
		LHAAP-17					Email		Sonia.West@alsglobal.com		Email Report To		Sharon.Pennington@CBIFederalServices.com			
Address		1203-B East Grand Avenue					Address		10450 Stancliff Rd., Suite 210		Mail Reports To		Sharon Pennington			
		PMB 202									Address		2410 Cherahala Blvd.			
City		Marshall			State	TX	City		Houston	State	TX	City		Knoxville	State	TN
Postal Code		75670			Country	USA	Postal Code		77099	Country	USA	Postal Code		37932	Country	USA
Phone Number		713.243.7264					Phone Number		281.575.2132 or 281.530.5656							
Project Manager		Praveen Srivastav									Shipping Company		FedEx			
SAMPLE DETAILS										ANALYSIS REQUESTED						
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330							
17SS94-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1407	1	X							
17SS94-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1409	1	X							
17SS99-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1415	1	X							
17SS99-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1417	1	X							
17SS99-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1419	1	X							
COE17-14A-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1425	1	X							
COE17-14A-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1427	1	X							
COE17-14A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1430	1	X							
COE17-14A-0.0-2.0-MS	LHAAP-17	0	2	FT	SO	1/12/2018	1425	1	X							
COE17-14A-2.5-4.5-MS	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1427	1	X							
COE17-14A-5.0-7.0-MS	LHAAP-17	5	7	FT	SO	1/12/2018	1430	1	X							
COE17-14A-0.0-2.0-MSD	LHAAP-17	0	2	FT	SO	1/12/2018	1425	1	X							
COE17-14A-2.5-4.5-MSD	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1427	1	X							
COE17-14A-5.0-7.0-MSD	LHAAP-17	5	7	FT	SO	1/12/2018	1430	1	X							
17SS101-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1436	1	X							
17SS101-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1438	1	X							
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS					RELINQUISHED BY/AFFILIATION			DATE/TIME		ACCEPTED BY/AFFILIATION			DATE/TIME			
					D. R.			1/12/18		Jm			1.15.18 09:15			
					D. R.			1900								

HS18010605
Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant



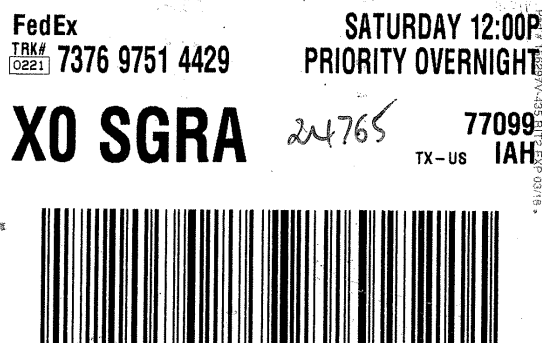
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DATE: 1/12/18
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42760 LIAAP

42760 JAN 15 2018



CUSTODY SEAL SM
DATE: 1/12/18
Signature: [Signature]
24765 LHA/AP

24765 JAN 15 2018

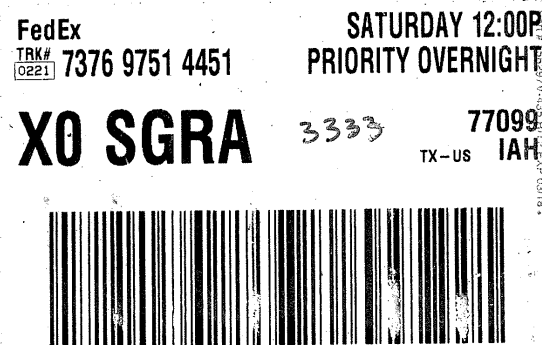


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DATE: 1/12/18 *01/15/18*
Signature: *DN*
23880 LHAAP

23880 JAN 15 2018



CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *DN*
3333 JAN 15 2018
3333 LHAAP





10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

January 30, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010607**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 26 sample(s) on Jan 12, 2018 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: Jumokey.Lawal
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010607

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010607-01	17SS110-5.0-7.0	Solid		11-Jan-2018 11:47	12-Jan-2018 09:19	☐
HS18010607-02	17SS115-0.0-2.0	Solid		11-Jan-2018 12:55	12-Jan-2018 09:19	☐
HS18010607-03	17SS115-2.5-4.5	Solid		11-Jan-2018 12:58	12-Jan-2018 09:19	☐
HS18010607-04	17SS115-5.0-7.0	Solid		11-Jan-2018 13:00	12-Jan-2018 09:19	☐
HS18010607-05	17SS115-0.0-2.0-FD	Solid		11-Jan-2018 12:55	12-Jan-2018 09:19	☐
HS18010607-06	17SS115-2.5-4.5-FD	Solid		11-Jan-2018 12:58	12-Jan-2018 09:19	☐
HS18010607-07	17SS115-5.0-7.0-FD	Solid		11-Jan-2018 13:00	12-Jan-2018 09:19	☐
HS18010607-08	17SS120-0.0-2.0	Solid		11-Jan-2018 13:12	12-Jan-2018 09:19	☐
HS18010607-09	17SS120-2.5-4.5	Solid		11-Jan-2018 13:14	12-Jan-2018 09:19	☐
HS18010607-10	17SS120-5.0-7.0	Solid		11-Jan-2018 13:16	12-Jan-2018 09:19	☐
HS18010607-11	17SS111-0.0-2.0	Solid		11-Jan-2018 13:25	12-Jan-2018 09:19	☐
HS18010607-12	17SS111-2.5-4.5	Solid		11-Jan-2018 13:26	12-Jan-2018 09:19	☐
HS18010607-13	17SS111-5.0-7.0	Solid		11-Jan-2018 13:27	12-Jan-2018 09:19	☐
HS18010607-14	17SS112-0.0-2.0	Solid		11-Jan-2018 13:35	12-Jan-2018 09:19	☐
HS18010607-15	17SS112-2.5-4.5	Solid		11-Jan-2018 13:36	12-Jan-2018 09:19	☐
HS18010607-16	17SS112-5.0-7.0	Solid		11-Jan-2018 13:37	12-Jan-2018 09:19	☐
HS18010607-17	17SS112-0.0-2.0-FD	Solid		11-Jan-2018 13:35	12-Jan-2018 09:19	☐
HS18010607-18	17SS112-2.5-4.5-FD	Solid		11-Jan-2018 13:36	12-Jan-2018 09:19	☐
HS18010607-19	17SS112-5.0-7.0-FD	Solid		11-Jan-2018 13:37	12-Jan-2018 09:19	☐
HS18010607-20	17SS113-0.0-2.0	Solid		11-Jan-2018 13:47	12-Jan-2018 09:19	☐
HS18010607-21	17SS113-2.5-4.5	Solid		11-Jan-2018 13:48	12-Jan-2018 09:19	☐
HS18010607-22	17SS113-5.0-7.0	Solid		11-Jan-2018 13:49	12-Jan-2018 09:19	☐
HS18010607-23	17SS114-0.0-2.0	Solid		11-Jan-2018 13:54	12-Jan-2018 09:19	☐
HS18010607-24	17SS114-2.5-4.5	Solid		11-Jan-2018 13:56	12-Jan-2018 09:19	☐
HS18010607-25	17SS114-5.0-7.0	Solid		11-Jan-2018 13:58	12-Jan-2018 09:19	☐
HS18010607-26	17SS21A-0.0-2.0	Solid		11-Jan-2018 09:05	12-Jan-2018 09:19	☐

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.**CASE NARRATIVE****Project:** Longhorn Army Ammunition Plant**Work Order:** HS18010607

HPLC by Method SW8330**Batch ID: 124384,124385,124400,124401**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216**Batch ID: R309182,R309183**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS110-5.0-7.0
 Collection Date: 11-Jan-2018 11:47

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-01
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.82	29.3	70.4	ug/Kg-dry	1	22-Jan-2018 11:59
2,4-Dinitrotoluene	29.3	U	5.21	29.3	70.4	ug/Kg-dry	1	22-Jan-2018 11:59
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.4	ug/Kg-dry	1	22-Jan-2018 11:59
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.8</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 11:59</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS115-0.0-2.0
 Collection Date: 11-Jan-2018 12:55

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-02
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.8	U	6.10	30.8	73.8	ug/Kg-dry	1	23-Jan-2018 03:31
2,4-Dinitrotoluene	30.8	U	5.46	30.8	73.8	ug/Kg-dry	1	23-Jan-2018 03:31
2,6-Dinitrotoluene	30.8	U	13.3	30.8	73.8	ug/Kg-dry	1	23-Jan-2018 03:31
<i>Surr: 1,2-Dinitrobenzene</i>	<i>81.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 03:31</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.3		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS115-2.5-4.5
 Collection Date: 11-Jan-2018 12:58

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-03
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.1	U	5.78	29.1	69.9	ug/Kg-dry	1	22-Jan-2018 12:35
2,4-Dinitrotoluene	29.1	U	5.17	29.1	69.9	ug/Kg-dry	1	22-Jan-2018 12:35
2,6-Dinitrotoluene	29.1	U	12.6	29.1	69.9	ug/Kg-dry	1	22-Jan-2018 12:35
<i>Surr: 1,2-Dinitrobenzene</i>	74.3			0	50-150	%REC	1	22-Jan-2018 12:35
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.6		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS115-5.0-7.0
 Collection Date: 11-Jan-2018 13:00

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-04
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.4	U	5.83	29.4	70.6	ug/Kg-dry	1	22-Jan-2018 14:22
2,4-Dinitrotoluene	29.4	U	5.22	29.4	70.6	ug/Kg-dry	1	22-Jan-2018 14:22
2,6-Dinitrotoluene	29.4	U	12.7	29.4	70.6	ug/Kg-dry	1	22-Jan-2018 14:22
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.8</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 14:22</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.4		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS115-0.0-2.0-FD
 Collection Date: 11-Jan-2018 12:55

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-05
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.7	U	5.89	29.7	71.3	ug/Kg-dry	1	22-Jan-2018 17:21
2,4-Dinitrotoluene	29.7	U	5.27	29.7	71.3	ug/Kg-dry	1	22-Jan-2018 17:21
2,6-Dinitrotoluene	29.7	U	12.8	29.7	71.3	ug/Kg-dry	1	22-Jan-2018 17:21
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 17:21</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS115-2.5-4.5-FD
 Collection Date: 11-Jan-2018 12:58

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-06
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.8	U	5.72	28.8	69.2	ug/Kg-dry	1	22-Jan-2018 17:57
2,4-Dinitrotoluene	28.8	U	5.12	28.8	69.2	ug/Kg-dry	1	22-Jan-2018 17:57
2,6-Dinitrotoluene	28.8	U	12.5	28.8	69.2	ug/Kg-dry	1	22-Jan-2018 17:57
<i>Surr: 1,2-Dinitrobenzene</i>	74.2			0	50-150	%REC	1	22-Jan-2018 17:57
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS115-5.0-7.0-FD
 Collection Date: 11-Jan-2018 13:00

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-07
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.1	U	5.58	28.1	67.5	ug/Kg-dry	1	22-Jan-2018 18:33
2,4-Dinitrotoluene	28.1	U	4.99	28.1	67.5	ug/Kg-dry	1	22-Jan-2018 18:33
2,6-Dinitrotoluene	28.1	U	12.1	28.1	67.5	ug/Kg-dry	1	22-Jan-2018 18:33
<i>Surr: 1,2-Dinitrobenzene</i>	74.6			0	50-150	%REC	1	22-Jan-2018 18:33
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.5		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS120-0.0-2.0
 Collection Date: 11-Jan-2018 13:12

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-08
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 17-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.3	U	6.22	31.3	75.2	ug/Kg-dry	1	22-Jan-2018 19:09
2,4-Dinitrotoluene	31.3	U	5.57	31.3	75.2	ug/Kg-dry	1	22-Jan-2018 19:09
2,6-Dinitrotoluene	31.3	U	13.5	31.3	75.2	ug/Kg-dry	1	22-Jan-2018 19:09
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>22-Jan-2018 19:09</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.4		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS120-2.5-4.5
 Collection Date: 11-Jan-2018 13:14

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-09
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.7	U	5.69	28.7	68.9	ug/Kg-dry	1	23-Jan-2018 09:30
2,4-Dinitrotoluene	28.7	U	5.10	28.7	68.9	ug/Kg-dry	1	23-Jan-2018 09:30
2,6-Dinitrotoluene	28.7	U	12.4	28.7	68.9	ug/Kg-dry	1	23-Jan-2018 09:30
<i>Surr: 1,2-Dinitrobenzene</i>	83.9			0	50-150	%REC	1	23-Jan-2018 09:30
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.6		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS120-5.0-7.0
 Collection Date: 11-Jan-2018 13:16

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-10
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.80	29.3	70.2	ug/Kg-dry	1	23-Jan-2018 13:08
2,4-Dinitrotoluene	29.3	U	5.20	29.3	70.2	ug/Kg-dry	1	23-Jan-2018 13:08
2,6-Dinitrotoluene	29.3	U	12.6	29.3	70.2	ug/Kg-dry	1	23-Jan-2018 13:08
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 13:08</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS111-0.0-2.0
 Collection Date: 11-Jan-2018 13:25

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-11
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.5	U	6.05	30.5	73.2	ug/Kg-dry	1	23-Jan-2018 13:44
2,4-Dinitrotoluene	30.5	U	5.41	30.5	73.2	ug/Kg-dry	1	23-Jan-2018 13:44
2,6-Dinitrotoluene	30.5	U	13.2	30.5	73.2	ug/Kg-dry	1	23-Jan-2018 13:44
<i>Surr: 1,2-Dinitrobenzene</i>	68.8			0	50-150	%REC	1	23-Jan-2018 13:44
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS111-2.5-4.5
 Collection Date: 11-Jan-2018 13:26

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-12
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.9	U	5.93	29.9	71.7	ug/Kg-dry	1	23-Jan-2018 14:20
2,4-Dinitrotoluene	29.9	U	5.31	29.9	71.7	ug/Kg-dry	1	23-Jan-2018 14:20
2,6-Dinitrotoluene	29.9	U	12.9	29.9	71.7	ug/Kg-dry	1	23-Jan-2018 14:20
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	23-Jan-2018 14:20
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.4		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS111-5.0-7.0
 Collection Date: 11-Jan-2018 13:27

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-13
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.1	U	5.37	27.1	65.0	ug/Kg-dry	1	23-Jan-2018 14:56
2,4-Dinitrotoluene	27.1	U	4.81	27.1	65.0	ug/Kg-dry	1	23-Jan-2018 14:56
2,6-Dinitrotoluene	27.1	U	11.7	27.1	65.0	ug/Kg-dry	1	23-Jan-2018 14:56
<i>Surr: 1,2-Dinitrobenzene</i>	72.3			0	50-150	%REC	1	23-Jan-2018 14:56
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	10.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS112-0.0-2.0
 Collection Date: 11-Jan-2018 13:35

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-14
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	5.99	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 15:32
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 15:32
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.4	ug/Kg-dry	1	23-Jan-2018 15:32
<i>Surr: 1,2-Dinitrobenzene</i>	72.6			0	50-150	%REC	1	23-Jan-2018 15:32
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.7		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS112-2.5-4.5
 Collection Date: 11-Jan-2018 13:36

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-15
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.5	U	5.66	28.5	68.4	ug/Kg-dry	1	23-Jan-2018 17:19
2,4-Dinitrotoluene	28.5	U	5.06	28.5	68.4	ug/Kg-dry	1	23-Jan-2018 17:19
2,6-Dinitrotoluene	28.5	U	12.3	28.5	68.4	ug/Kg-dry	1	23-Jan-2018 17:19
<i>Surr: 1,2-Dinitrobenzene</i>	73.6			0	50-150	%REC	1	23-Jan-2018 17:19
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.7		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS112-5.0-7.0
 Collection Date: 11-Jan-2018 13:37

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-16
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.9	U	5.73	28.9	69.3	ug/Kg-dry	1	24-Jan-2018 18:25
2,4-Dinitrotoluene	28.9	U	5.13	28.9	69.3	ug/Kg-dry	1	24-Jan-2018 18:25
2,6-Dinitrotoluene	28.9	U	12.5	28.9	69.3	ug/Kg-dry	1	24-Jan-2018 18:25
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 18:25</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.9		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS112-0.0-2.0-FD
 Collection Date: 11-Jan-2018 13:35

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-17
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.3	U	6.22	31.3	75.2	ug/Kg-dry	1	23-Jan-2018 20:19
2,4-Dinitrotoluene	31.3	U	5.57	31.3	75.2	ug/Kg-dry	1	23-Jan-2018 20:19
2,6-Dinitrotoluene	31.3	U	13.5	31.3	75.2	ug/Kg-dry	1	23-Jan-2018 20:19
<i>Surr: 1,2-Dinitrobenzene</i>	73.3			0	50-150	%REC	1	23-Jan-2018 20:19
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS112-2.5-4.5-FD
 Collection Date: 11-Jan-2018 13:36

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-18
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.0	U	5.95	30.0	71.9	ug/Kg-dry	1	23-Jan-2018 20:54
2,4-Dinitrotoluene	30.0	U	5.32	30.0	71.9	ug/Kg-dry	1	23-Jan-2018 20:54
2,6-Dinitrotoluene	30.0	U	12.9	30.0	71.9	ug/Kg-dry	1	23-Jan-2018 20:54
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.9</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 20:54</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS112-5.0-7.0-FD
 Collection Date: 11-Jan-2018 13:37

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-19
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.5	U	5.86	29.5	70.9	ug/Kg-dry	1	23-Jan-2018 21:30
2,4-Dinitrotoluene	29.5	U	5.25	29.5	70.9	ug/Kg-dry	1	23-Jan-2018 21:30
2,6-Dinitrotoluene	29.5	U	12.8	29.5	70.9	ug/Kg-dry	1	23-Jan-2018 21:30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 21:30</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS113-0.0-2.0
 Collection Date: 11-Jan-2018 13:47

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-20
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.2	U	6.19	31.2	74.9	ug/Kg-dry	1	23-Jan-2018 22:06
2,4-Dinitrotoluene	31.2	U	5.54	31.2	74.9	ug/Kg-dry	1	23-Jan-2018 22:06
2,6-Dinitrotoluene	31.2	U	13.5	31.2	74.9	ug/Kg-dry	1	23-Jan-2018 22:06
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.5</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 22:06</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.9		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS113-2.5-4.5
 Collection Date: 11-Jan-2018 13:48

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-21
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.3	U	5.82	29.3	70.4	ug/Kg-dry	1	23-Jan-2018 22:42
2,4-Dinitrotoluene	29.3	U	5.21	29.3	70.4	ug/Kg-dry	1	23-Jan-2018 22:42
2,6-Dinitrotoluene	29.3	U	12.7	29.3	70.4	ug/Kg-dry	1	23-Jan-2018 22:42
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 22:42</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.0		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS113-5.0-7.0
 Collection Date: 11-Jan-2018 13:49

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-22
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.6	U	5.88	29.6	71.1	ug/Kg-dry	1	23-Jan-2018 23:18
2,4-Dinitrotoluene	29.6	U	5.26	29.6	71.1	ug/Kg-dry	1	23-Jan-2018 23:18
2,6-Dinitrotoluene	29.6	U	12.8	29.6	71.1	ug/Kg-dry	1	23-Jan-2018 23:18
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 23:18</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.3		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS114-0.0-2.0
 Collection Date: 11-Jan-2018 13:54

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-23
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.9	U	5.93	29.9	71.7	ug/Kg-dry	1	23-Jan-2018 23:54
2,4-Dinitrotoluene	29.9	U	5.31	29.9	71.7	ug/Kg-dry	1	23-Jan-2018 23:54
2,6-Dinitrotoluene	29.9	U	12.9	29.9	71.7	ug/Kg-dry	1	23-Jan-2018 23:54
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>23-Jan-2018 23:54</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.2		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS114-2.5-4.5
 Collection Date: 11-Jan-2018 13:56

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-24
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.1	U	6.36	32.1	77.0	ug/Kg-dry	1	24-Jan-2018 00:29
2,4-Dinitrotoluene	32.1	U	5.69	32.1	77.0	ug/Kg-dry	1	24-Jan-2018 00:29
2,6-Dinitrotoluene	32.1	U	13.9	32.1	77.0	ug/Kg-dry	1	24-Jan-2018 00:29
<i>Surr: 1,2-Dinitrobenzene</i>	<i>71.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 00:29</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.8		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS114-5.0-7.0
 Collection Date: 11-Jan-2018 13:58

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-25
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.2	U	6.20	31.2	75.0	ug/Kg-dry	1	24-Jan-2018 01:05
2,4-Dinitrotoluene	31.2	U	5.55	31.2	75.0	ug/Kg-dry	1	24-Jan-2018 01:05
2,6-Dinitrotoluene	31.2	U	13.5	31.2	75.0	ug/Kg-dry	1	24-Jan-2018 01:05
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	24-Jan-2018 01:05
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.9		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS21A-0.0-2.0
 Collection Date: 11-Jan-2018 09:05

ANALYTICAL REPORT

WorkOrder:HS18010607
 Lab ID:HS18010607-26
 Matrix:Solid

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 18-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.1	U	5.97	30.1	72.2	ug/Kg-dry	1	24-Jan-2018 01:41
2,4-Dinitrotoluene	30.1	U	5.34	30.1	72.2	ug/Kg-dry	1	24-Jan-2018 01:41
2,6-Dinitrotoluene	30.1	U	13.0	30.1	72.2	ug/Kg-dry	1	24-Jan-2018 01:41
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>24-Jan-2018 01:41</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.7		0.0100	0.0100	0.0100	wt%	1	18-Jan-2018 11:30

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010607**Batch ID:** 124384 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010607-02	1	2.04	10 (mL)	4902

Batch ID: 124385 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010607-01	1	2.03	10 (mL)	4926
HS18010607-03	1	2.01	10 (mL)	4975
HS18010607-04	1	2.01	10 (mL)	4975
HS18010607-05	1	2.1	10 (mL)	4762
HS18010607-06	1	2.04	10 (mL)	4902
HS18010607-07	1	2.08	10 (mL)	4808
HS18010607-08	1	2.03	10 (mL)	4926

Batch ID: 124400 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010607-09	1	2.04	10 (mL)	4902
HS18010607-10	1	2.03	10 (mL)	4926
HS18010607-11	1	2.05	10 (mL)	4878
HS18010607-12	1	2.05	10 (mL)	4878
HS18010607-13	1	2.07	10 (mL)	4831
HS18010607-14	1	2.09	10 (mL)	4785
HS18010607-15	1	2.08	10 (mL)	4808
HS18010607-17	1	2.05	10 (mL)	4878
HS18010607-18	1	2.01	10 (mL)	4975
HS18010607-19	1	2.02	10 (mL)	4950
HS18010607-20	1	2	10 (mL)	5000
HS18010607-21	1	2.03	10 (mL)	4926
HS18010607-22	1	2.04	10 (mL)	4902
HS18010607-23	1	2.02	10 (mL)	4950
HS18010607-24	1	2.02	10 (mL)	4950
HS18010607-25	1	2.05	10 (mL)	4878
HS18010607-26	1	2.07	10 (mL)	4831

Batch ID: 124401 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010607-16	1	2.06	10 (mL)	4854

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124384 Test Name : EXPLOSIVES BY SW8330B Matrix: Solid						
HS18010607-02	17SS115-0.0-2.0	11 Jan 2018 12:55		17 Jan 2018 15:42	23 Jan 2018 03:31	1
Batch ID 124385 Test Name : EXPLOSIVES BY SW8330B Matrix: Solid						
HS18010607-01	17SS110-5.0-7.0	11 Jan 2018 11:47		17 Jan 2018 15:43	22 Jan 2018 11:59	1
HS18010607-03	17SS115-2.5-4.5	11 Jan 2018 12:58		17 Jan 2018 15:43	22 Jan 2018 12:35	1
HS18010607-04	17SS115-5.0-7.0	11 Jan 2018 13:00		17 Jan 2018 15:43	22 Jan 2018 14:22	1
HS18010607-05	17SS115-0.0-2.0-FD	11 Jan 2018 12:55		17 Jan 2018 15:43	22 Jan 2018 17:21	1
HS18010607-06	17SS115-2.5-4.5-FD	11 Jan 2018 12:58		17 Jan 2018 15:43	22 Jan 2018 17:57	1
HS18010607-07	17SS115-5.0-7.0-FD	11 Jan 2018 13:00		17 Jan 2018 15:43	22 Jan 2018 18:33	1
HS18010607-08	17SS120-0.0-2.0	11 Jan 2018 13:12		17 Jan 2018 15:43	22 Jan 2018 19:09	1
Batch ID 124400 Test Name : EXPLOSIVES BY SW8330B Matrix: Solid						
HS18010607-09	17SS120-2.5-4.5	11 Jan 2018 13:14		18 Jan 2018 08:52	23 Jan 2018 09:30	1
HS18010607-10	17SS120-5.0-7.0	11 Jan 2018 13:16		18 Jan 2018 08:52	23 Jan 2018 13:08	1
HS18010607-11	17SS111-0.0-2.0	11 Jan 2018 13:25		18 Jan 2018 08:52	23 Jan 2018 13:44	1
HS18010607-12	17SS111-2.5-4.5	11 Jan 2018 13:26		18 Jan 2018 08:52	23 Jan 2018 14:20	1
HS18010607-13	17SS111-5.0-7.0	11 Jan 2018 13:27		18 Jan 2018 08:52	23 Jan 2018 14:56	1
HS18010607-14	17SS112-0.0-2.0	11 Jan 2018 13:35		18 Jan 2018 08:52	23 Jan 2018 15:32	1
HS18010607-15	17SS112-2.5-4.5	11 Jan 2018 13:36		18 Jan 2018 08:52	23 Jan 2018 17:19	1
HS18010607-17	17SS112-0.0-2.0-FD	11 Jan 2018 13:35		18 Jan 2018 08:52	23 Jan 2018 20:19	1
HS18010607-18	17SS112-2.5-4.5-FD	11 Jan 2018 13:36		18 Jan 2018 08:52	23 Jan 2018 20:54	1
HS18010607-19	17SS112-5.0-7.0-FD	11 Jan 2018 13:37		18 Jan 2018 08:52	23 Jan 2018 21:30	1
HS18010607-20	17SS113-0.0-2.0	11 Jan 2018 13:47		18 Jan 2018 08:52	23 Jan 2018 22:06	1
HS18010607-21	17SS113-2.5-4.5	11 Jan 2018 13:48		18 Jan 2018 08:52	23 Jan 2018 22:42	1
HS18010607-22	17SS113-5.0-7.0	11 Jan 2018 13:49		18 Jan 2018 08:52	23 Jan 2018 23:18	1
HS18010607-23	17SS114-0.0-2.0	11 Jan 2018 13:54		18 Jan 2018 08:52	23 Jan 2018 23:54	1
HS18010607-24	17SS114-2.5-4.5	11 Jan 2018 13:56		18 Jan 2018 08:52	24 Jan 2018 00:29	1
HS18010607-25	17SS114-5.0-7.0	11 Jan 2018 13:58		18 Jan 2018 08:52	24 Jan 2018 01:05	1
HS18010607-26	17SS21A-0.0-2.0	11 Jan 2018 09:05		18 Jan 2018 08:52	24 Jan 2018 01:41	1
Batch ID 124401 Test Name : EXPLOSIVES BY SW8330B Matrix: Solid						
HS18010607-16	17SS112-5.0-7.0	11 Jan 2018 13:37		18 Jan 2018 08:52	24 Jan 2018 18:25	1
Batch ID R309182 Test Name : MOISTURE - ASTM D2216 Matrix: Solid						
HS18010607-01	17SS110-5.0-7.0	11 Jan 2018 11:47			18 Jan 2018 11:05	1
HS18010607-02	17SS115-0.0-2.0	11 Jan 2018 12:55			18 Jan 2018 11:05	1
HS18010607-03	17SS115-2.5-4.5	11 Jan 2018 12:58			18 Jan 2018 11:05	1
HS18010607-04	17SS115-5.0-7.0	11 Jan 2018 13:00			18 Jan 2018 11:05	1
HS18010607-05	17SS115-0.0-2.0-FD	11 Jan 2018 12:55			18 Jan 2018 11:05	1
HS18010607-06	17SS115-2.5-4.5-FD	11 Jan 2018 12:58			18 Jan 2018 11:05	1
HS18010607-07	17SS115-5.0-7.0-FD	11 Jan 2018 13:00			18 Jan 2018 11:05	1
HS18010607-08	17SS120-0.0-2.0	11 Jan 2018 13:12			18 Jan 2018 11:05	1

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID	R309183	Test Name : MOISTURE - ASTM D2216			Matrix: Solid	
HS18010607-09	17SS120-2.5-4.5	11 Jan 2018 13:14			18 Jan 2018 11:30	1
HS18010607-10	17SS120-5.0-7.0	11 Jan 2018 13:16			18 Jan 2018 11:30	1
HS18010607-11	17SS111-0.0-2.0	11 Jan 2018 13:25			18 Jan 2018 11:30	1
HS18010607-12	17SS111-2.5-4.5	11 Jan 2018 13:26			18 Jan 2018 11:30	1
HS18010607-13	17SS111-5.0-7.0	11 Jan 2018 13:27			18 Jan 2018 11:30	1
HS18010607-14	17SS112-0.0-2.0	11 Jan 2018 13:35			18 Jan 2018 11:30	1
HS18010607-15	17SS112-2.5-4.5	11 Jan 2018 13:36			18 Jan 2018 11:30	1
HS18010607-16	17SS112-5.0-7.0	11 Jan 2018 13:37			18 Jan 2018 11:30	1
HS18010607-17	17SS112-0.0-2.0-FD	11 Jan 2018 13:35			18 Jan 2018 11:30	1
HS18010607-18	17SS112-2.5-4.5-FD	11 Jan 2018 13:36			18 Jan 2018 11:30	1
HS18010607-19	17SS112-5.0-7.0-FD	11 Jan 2018 13:37			18 Jan 2018 11:30	1
HS18010607-20	17SS113-0.0-2.0	11 Jan 2018 13:47			18 Jan 2018 11:30	1
HS18010607-21	17SS113-2.5-4.5	11 Jan 2018 13:48			18 Jan 2018 11:30	1
HS18010607-22	17SS113-5.0-7.0	11 Jan 2018 13:49			18 Jan 2018 11:30	1
HS18010607-23	17SS114-0.0-2.0	11 Jan 2018 13:54			18 Jan 2018 11:30	1
HS18010607-24	17SS114-2.5-4.5	11 Jan 2018 13:56			18 Jan 2018 11:30	1
HS18010607-25	17SS114-5.0-7.0	11 Jan 2018 13:58			18 Jan 2018 11:30	1
HS18010607-26	17SS21A-0.0-2.0	11 Jan 2018 09:05			18 Jan 2018 11:30	1

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: 124384		Instrument: HPLC3		Method: SW8330						
MBLK	Sample ID: MBLK-124384	Units: ug/Kg			Analysis Date: 22-Jan-2018 23:20					
Client ID:	Run ID: HPLC3_309353	SeqNo: 4401080		PrepDate: 17-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	25.0	60.0								U
2,4-Dinitrotoluene	25.0	60.0								U
2,6-Dinitrotoluene	25.0	60.0								U
Surr: 1,2-Dinitrobenzene	992.3	60.0	1250	0	79.4	50 - 150				

LCS	Sample ID: LCS-124384	Units: ug/Kg			Analysis Date: 22-Jan-2018 23:56					
Client ID:	Run ID: HPLC3_309353	SeqNo: 4401081		PrepDate: 17-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1303	60.0	1250	0	104	75 - 125				
2,4-Dinitrotoluene	1295	60.0	1250	0	104	82 - 123				
2,6-Dinitrotoluene	1277	60.0	1250	0	102	86 - 119				
Surr: 1,2-Dinitrobenzene	1234	60.0	1250	0	98.7	50 - 150				

MS	Sample ID: HS18010607-02MS	Units: ug/Kg			Analysis Date: 23-Jan-2018 04:07					
Client ID: 17SS115-0.0-2.0	Run ID: HPLC3_309353	SeqNo: 4401411		PrepDate: 17-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1371	59.7	1244	0	110	75 - 125				
2,4-Dinitrotoluene	1343	59.7	1244	0	108	82 - 123				
2,6-Dinitrotoluene	1326	59.7	1244	0	107	86 - 119				
Surr: 1,2-Dinitrobenzene	1050	59.7	1244	0	84.4	50 - 150				

MSD	Sample ID: HS18010607-02MSD	Units: ug/Kg			Analysis Date: 23-Jan-2018 04:43					
Client ID: 17SS115-0.0-2.0	Run ID: HPLC3_309353	SeqNo: 4401412		PrepDate: 17-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1393	59.4	1238	0	113	75 - 125	1371	1.61	30	
2,4-Dinitrotoluene	1354	59.4	1238	0	109	82 - 123	1343	0.789	30	
2,6-Dinitrotoluene	1339	59.4	1238	0	108	86 - 119	1326	0.96	30	
Surr: 1,2-Dinitrobenzene	1065	59.4	1238	0	86.1	50 - 150	1050	1.44	30	

The following samples were analyzed in this batch: HS18010607-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: 124385		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124385	Units: ug/Kg		Analysis Date: 22-Jan-2018 01:50					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400219		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>917.2</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.4</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124385	Units: ug/Kg		Analysis Date: 22-Jan-2018 02:26					
Client ID:	Run ID: HPLC3_309268	SeqNo: 4400220		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1234	60.0	1250	0	98.7	75 - 125			
2,4-Dinitrotoluene	1226	60.0	1250	0	98.1	82 - 123			
2,6-Dinitrotoluene	1209	60.0	1250	0	96.8	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1167</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>93.4</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-04MS	Units: ug/Kg		Analysis Date: 22-Jan-2018 16:10					
Client ID: 17SS115-5.0-7.0	Run ID: HPLC3_309268	SeqNo: 4400240		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1210	59.1	1232	0	98.3	75 - 125			
2,4-Dinitrotoluene	1213	59.1	1232	0	98.5	82 - 123			
2,6-Dinitrotoluene	1183	59.1	1232	0	96.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>917.9</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>74.5</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-03MS	Units: ug/Kg		Analysis Date: 22-Jan-2018 13:11					
Client ID: 17SS115-2.5-4.5	Run ID: HPLC3_309268	SeqNo: 4400235		PrepDate: 17-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1166	58.0	1208	0	96.6	75 - 125			
2,4-Dinitrotoluene	1158	58.0	1208	0	95.9	82 - 123			
2,6-Dinitrotoluene	1137	58.0	1208	0	94.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>909.8</i>	<i>58.0</i>	<i>1208</i>	<i>0</i>	<i>75.3</i>	<i>50 - 150</i>			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: 124385		Instrument: HPLC3		Method: SW8330						
MSD		Sample ID: HS18010607-04MSD		Units: ug/Kg		Analysis Date: 22-Jan-2018 16:46				
Client ID: 17SS115-5.0-7.0		Run ID: HPLC3_309268		SeqNo: 4400241		PrepDate: 17-Jan-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1237	59.7	1244	0	99.4	75 - 125	1210	2.18	30	
2,4-Dinitrotoluene	1230	59.7	1244	0	98.9	82 - 123	1213	1.45	30	
2,6-Dinitrotoluene	1206	59.7	1244	0	96.9	86 - 119	1183	1.9	30	
Surr: 1,2-Dinitrobenzene	919.3	59.7	1244	0	73.9	50 - 150	917.9	0.151	30	

MSD		Sample ID: HS18010607-03MSD		Units: ug/Kg		Analysis Date: 22-Jan-2018 13:46				
Client ID: 17SS115-2.5-4.5		Run ID: HPLC3_309268		SeqNo: 4400236		PrepDate: 17-Jan-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1167	58.5	1220	0	95.7	75 - 125	1166	0.0821	30	
2,4-Dinitrotoluene	1169	58.5	1220	0	95.9	82 - 123	1158	0.971	30	
2,6-Dinitrotoluene	1150	58.5	1220	0	94.3	86 - 119	1137	1.18	30	
Surr: 1,2-Dinitrobenzene	913.8	58.5	1220	0	74.9	50 - 150	909.8	0.438	30	

The following samples were analyzed in this batch:

HS18010607-01	HS18010607-03	HS18010607-04	HS18010607-05
HS18010607-06	HS18010607-07	HS18010607-08	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: 124400		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124400	Units: ug/Kg		Analysis Date: 23-Jan-2018 06:30					
Client ID:	Run ID: HPLC3_309403	SeqNo: 4402276		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1052</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>84.1</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124400	Units: ug/Kg		Analysis Date: 23-Jan-2018 07:06					
Client ID:	Run ID: HPLC3_309403	SeqNo: 4402277		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1369	60.0	1250	0	109	75 - 125			
2,4-Dinitrotoluene	1484	60.0	1250	0	119	82 - 123			
2,6-Dinitrotoluene	1439	60.0	1250	0	115	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>1427</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>114</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-15MS	Units: ug/Kg		Analysis Date: 23-Jan-2018 17:55					
Client ID: 17SS112-2.5-4.5	Run ID: HPLC3_309403	SeqNo: 4402294		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1123	58.8	1225	0	91.7	75 - 125			
2,4-Dinitrotoluene	1195	58.8	1225	0	97.5	82 - 123			
2,6-Dinitrotoluene	1170	58.8	1225	0	95.5	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>914.5</i>	<i>58.8</i>	<i>1225</i>	<i>0</i>	<i>74.6</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-14MS	Units: ug/Kg		Analysis Date: 23-Jan-2018 16:07					
Client ID: 17SS112-0.0-2.0	Run ID: HPLC3_309403	SeqNo: 4402291		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1113	59.1	1232	0	90.4	75 - 125			
2,4-Dinitrotoluene	1197	59.1	1232	0	97.2	82 - 123			
2,6-Dinitrotoluene	1171	59.1	1232	0	95.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>911.9</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>74.0</i>	<i>50 - 150</i>			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: 124400		Instrument: HPLC3		Method: SW8330						
MSD		Sample ID: HS18010607-15MSD		Units: ug/Kg		Analysis Date: 23-Jan-2018 18:31				
Client ID: 17SS112-2.5-4.5		Run ID: HPLC3_309403		SeqNo: 4402295		PrepDate: 18-Jan-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1129	59.1	1232	0	91.7	75 - 125	1123	0.491	30	
2,4-Dinitrotoluene	1197	59.1	1232	0	97.2	82 - 123	1195	0.235	30	
2,6-Dinitrotoluene	1170	59.1	1232	0	95.0	86 - 119	1170	0.0214	30	
<i>Surr: 1,2-Dinitrobenzene</i>	<i>912.4</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>74.1</i>	<i>50 - 150</i>	<i>914.5</i>	<i>0.227</i>	<i>30</i>	

MSD		Sample ID: HS18010607-14MSD		Units: ug/Kg		Analysis Date: 23-Jan-2018 16:43				
Client ID: 17SS112-0.0-2.0		Run ID: HPLC3_309403		SeqNo: 4402292		PrepDate: 18-Jan-2018		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,6-Trinitrotoluene	1129	59.4	1238	0	91.2	75 - 125	1113	1.44	30	
2,4-Dinitrotoluene	1210	59.4	1238	0	97.7	82 - 123	1197	1.01	30	
2,6-Dinitrotoluene	1177	59.4	1238	0	95.1	86 - 119	1171	0.494	30	
<i>Surr: 1,2-Dinitrobenzene</i>	<i>920.8</i>	<i>59.4</i>	<i>1238</i>	<i>0</i>	<i>74.4</i>	<i>50 - 150</i>	<i>911.9</i>	<i>0.973</i>	<i>30</i>	

The following samples were analyzed in this batch:

HS18010607-09	HS18010607-10	HS18010607-11	HS18010607-12
HS18010607-13	HS18010607-14	HS18010607-15	HS18010607-17
HS18010607-18	HS18010607-19	HS18010607-20	HS18010607-21
HS18010607-22	HS18010607-23	HS18010607-24	HS18010607-25
HS18010607-26			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: 124401		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124401	Units: ug/Kg		Analysis Date: 24-Jan-2018 03:29					
Client ID:	Run ID: HPLC3_309438	SeqNo: 4402864		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>913.9</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.1</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124401	Units: ug/Kg		Analysis Date: 24-Jan-2018 04:05					
Client ID:	Run ID: HPLC3_309438	SeqNo: 4402865		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1144	60.0	1250	0	91.5	75 - 125			
2,4-Dinitrotoluene	1208	60.0	1250	0	96.6	82 - 123			
2,6-Dinitrotoluene	1185	60.0	1250	0	94.8	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>922.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.8</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010607-16MS	Units: ug/Kg		Analysis Date: 24-Jan-2018 19:00					
Client ID: 17SS112-5.0-7.0	Run ID: HPLC3_309438	SeqNo: 4404090		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1142	58.5	1220	0	93.7	75 - 125			
2,4-Dinitrotoluene	1209	58.5	1220	0	99.1	82 - 123			
2,6-Dinitrotoluene	1176	58.5	1220	0	96.5	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>911.6</i>	<i>58.5</i>	<i>1220</i>	<i>0</i>	<i>74.8</i>	<i>50 - 150</i>			

MSD	Sample ID: HS18010607-16MSD	Units: ug/Kg		Analysis Date: 24-Jan-2018 19:36					
Client ID: 17SS112-5.0-7.0	Run ID: HPLC3_309438	SeqNo: 4404091		PrepDate: 18-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1117	58.3	1214	0	92.1	75 - 125	1142	2.21	30
2,4-Dinitrotoluene	1207	58.3	1214	0	99.5	82 - 123	1209	0.135	30
2,6-Dinitrotoluene	1178	58.3	1214	0	97.0	86 - 119	1176	0.119	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>902.9</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>74.4</i>	<i>50 - 150</i>	<i>911.6</i>	<i>0.964</i>	<i>30</i>

The following samples were analyzed in this batch: HS18010607-16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: R309182		Instrument: Balance1		Method: ASTM D2216					
DUP	Sample ID: HS18010607-04DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:05					
Client ID: 17SS115-5.0-7.0	Run ID: Balance1_309182		SeqNo: 4397365		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	14.8	0.0100					15.4	3.97	20
DUP	Sample ID: HS18010607-03DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:05					
Client ID: 17SS115-2.5-4.5	Run ID: Balance1_309182		SeqNo: 4397364		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	13.5	0.0100					14.6	7.83	20
DUP	Sample ID: HS18010607-02DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:05					
Client ID: 17SS115-0.0-2.0	Run ID: Balance1_309182		SeqNo: 4397363		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	19.9	0.0100					20.3	1.99	20
The following samples were analyzed in this batch:				HS18010607-01	HS18010607-02	HS18010607-03	HS18010607-04		
				HS18010607-05	HS18010607-06	HS18010607-07	HS18010607-08		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

QC BATCH REPORT

Batch ID: R309183		Instrument: Balance1		Method: ASTM D2216					
DUP	Sample ID: HS18010607-16DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:30					
Client ID: 17SS112-5.0-7.0	Run ID: Balance1_309183	SeqNo: 4397386		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	16.5	0.0100					15.9	3.7	20
DUP	Sample ID: HS18010607-15DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:30					
Client ID: 17SS112-2.5-4.5	Run ID: Balance1_309183	SeqNo: 4397385		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	14	0.0100					15.7	11.4	20
DUP	Sample ID: HS18010607-14DUP	Units: wt%		Analysis Date: 18-Jan-2018 11:30					
Client ID: 17SS112-0.0-2.0	Run ID: Balance1_309183	SeqNo: 4397384		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	19.4	0.0100					20.7	6.48	20
The following samples were analyzed in this batch:									
HS18010607-09		HS18010607-10		HS18010607-11		HS18010607-12			
HS18010607-13		HS18010607-14		HS18010607-15		HS18010607-16			
HS18010607-17		HS18010607-18		HS18010607-19		HS18010607-20			
HS18010607-21		HS18010607-22		HS18010607-23		HS18010607-24			
HS18010607-25		HS18010607-26							

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010607

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group USA, Corp

Date: 30-Jan-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010607

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18010607-01	17SS110-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-02	17SS115-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-03	17SS115-2.5-4.5	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-04	17SS115-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-05	17SS115-0.0-2.0-FD	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-06	17SS115-2.5-4.5-FD	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-07	17SS115-5.0-7.0-FD	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-08	17SS120-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA267
HS18010607-09	17SS120-2.5-4.5	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-10	17SS120-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-11	17SS111-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-12	17SS111-2.5-4.5	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-13	17SS111-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-14	17SS112-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-15	17SS112-2.5-4.5	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-16	17SS112-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-17	17SS112-0.0-2.0-FD	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-18	17SS112-2.5-4.5-FD	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-19	17SS112-5.0-7.0-FD	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-20	17SS113-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-21	17SS113-2.5-4.5	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-22	17SS113-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-23	17SS114-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-24	17SS114-2.5-4.5	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-25	17SS114-5.0-7.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268
HS18010607-26	17SS21A-0.0-2.0	Login	1/16/2018 2:20:31 PM	RPG	SPA268

ALS Group USA, Corp

Date: 30-Jan-18

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS18010607

Date/Time Received: **12-Jan-2018 09:19**
 Received by: **CL**

Checklist completed by: Pablo Martinez 15-Jan-2018
 eSignature Date

Reviewed by: RJ Modashia 17-Jan-2018
 eSignature Date

Matrices: **SOIL**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☒	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.8C/1.1C, 0.3C/0.6C UC/C IR # 30

Cooler(s)/Kit(s): 25401, 42769

Date/Time sample(s) sent to storage: 1/15/2018 19:00

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: Sample Rec'd not listed on COC
 17SS21A-0.0-2.0
 collected 01/11/2018 09:05
 Logged in sample on
 WO HS18010607-26A

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

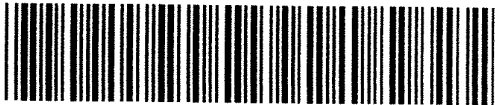
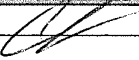
Corrective Action:

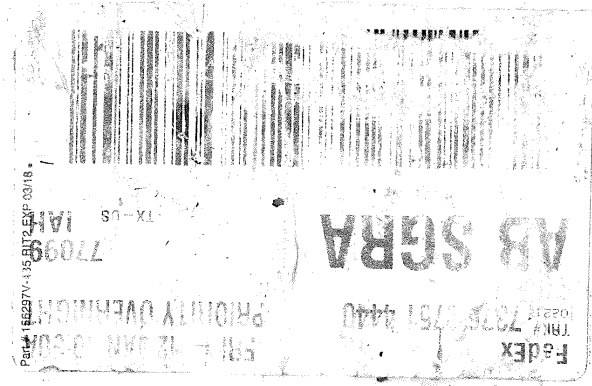
45 of 48

APTIM		Page 4 of 5											
COC ID:		17-JAN2018-GW-ALSHT-011118				TURNAROUND TIME: normal				RUSH:			
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO			
Facility Name	Longhorn AAP					Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com		
Project Number	501032					Lab Contact	Sonia West						
	LHAAP-17					Email	Sonia.West@alsglobal.com			Email Report To	Sharon.Pennington@CBIFederalServices.com		
Address	1203-B East Grand Avenue					Address	10450 Stancliff Rd., Suite 210			Mail Reports To	Sharon Pennington		
	PMB 202									Address	2410 Cherahala Blvd.		
City	Marshall	State	TX			City	Houston	State	TX	City	Knoxville	State	TN
Postal Code	75670	Country	USA			Postal Code	77099	Country	USA	Postal Code	37932	Country	USA
Phone Number	713.243.7264					Phone Number	281.575.2132 or 281.530.5656						
Project Manager	Praveen Srivastav									Shipping Company	FedEx		
SAMPLE DETAILS									ANALYSIS REQUESTED				
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330				
17SS111-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1325	1	X				
17SS111-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1326	1	X				
17SS111-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1327	1	X				
17SS112-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1335	1	X				
17SS112-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1336	1	X				
17SS112-5.0-7.0	LHAAP-17	5	7	FT	SO	1/11/2018	1337	1	X				
17SS112-0.0-2.0-FD	LHAAP-17	0	2	FT	SO	1/11/2018	1335	1	X				
17SS112-2.5-4.5-FD	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1336	1	X				
17SS112-5.0-7.0-FD	LHAAP-17	5	7	FT	SO	1/11/2018	1337	1	X				
17SS112-0.0-2.0-MS	LHAAP-17	0	2	FT	SO	1/11/2018	1335	1	X				
17SS112-2.5-4.5-MS	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1336	1	X				
17SS112-5.0-7.0-MS	LHAAP-17	5	7	FT	SO	1/11/2018	1337	1	X				
17SS112-0.0-2.0-MSD	LHAAP-17	0	2	FT	SO	1/11/2018	1335	1	X				
17SS112-2.5-4.5-MSD	LHAAP-17	2.5	4.5	FT	SO	1/11/2018	1336	1	X				
17SS112-5.0-7.0-MSD	LHAAP-17	5	7	FT	SO	1/11/2018	1337	1	X				
17SS113-0.0-2.0	LHAAP-17	0	2	FT	SO	1/11/2018	1347	1	X				
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS					RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION		DATE/TIME		
					DAVID Kowin / APTIM		1-11-18		[Signature]		1.12.18 0919		
					[Signature]								

HS18010607
 Aptim Environmental & Infrastructure, Inc.
 Longhorn Army Ammunition Plant

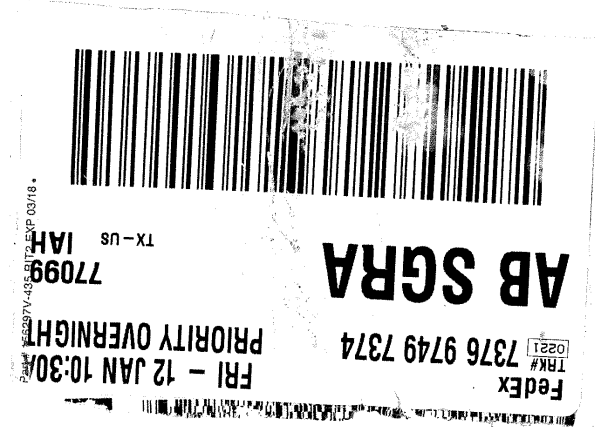


COC ID:		17-JAN2018-GW-ALSHT-011118				TURNAROUND TIME: normal				RUSH:										
PROJECT/CLIENT INFO										LABORATORY				OTHER INFO						
Facility Name		Longhorn AAP						Lab Name		ALS Laboratories		Email Invoice To		FedInvoices@CBIFederalServices.com						
Project Number		501032						Lab Contact		Sonia West										
		LHAAP-17						Email		Sonia.West@alsglobal.com		Email Report To		Sharon.Pennington@CBIFederalServices.com						
Address		1203-B East Grand Avenue						Address		10450 Stancliff Rd., Suite 210		Mail Reports To		Sharon Pennington						
		PMB 202										Address		2410 Cherahala Blvd.						
City		Marshall			State	TX		City		Houston		State	TX							
Postal Code		75670			Country	USA		Postal Code		77099		Country	USA							
Phone Number		713.243.7264						Phone Number		281.575.2132 or 281.530.5656		Postal Code		37932						
Project Manager		Praveen Srivastav										Shipping Company		FedEx						
SAMPLE DETAILS										ANALYSIS REQUESTED										
Sample ID		Location		Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330		HS18010607 Aptim Environmental & Infrastructure, Inc. Longhorn Army Ammunition Plant							
17SS113-2.5-4.5		LHAAP-17		2.5	4.5	FT	SO	1/11/2018	1348	1	X									
17SS113-5.0-7.0		LHAAP-17		5	7	FT	SO	1/11/2018	1349	1	X									
17SS114-0.0-2.0		LHAAP-17		0	2	FT	SO	1/11/2018	1354	1	X									
17SS114-2.5-4.5		LHAAP-17		2.5	4.5	FT	SO	1/11/2018	1356	1	X									
17SS114-5.0-7.0		LHAAP-17		5	7	FT	SO	1/11/2018	1358	1	X									
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS										RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION		DATE/TIME				
										DAVID ROWAN / APTIM		1-11-18				1.12.18 0919				
																				

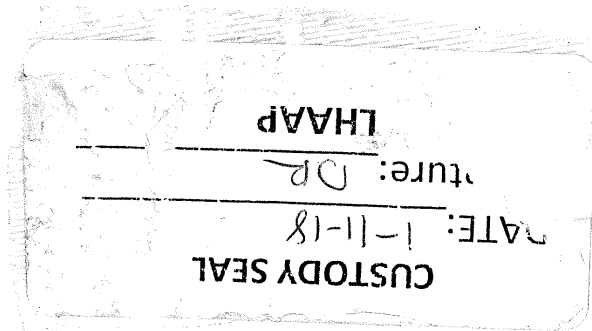


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25401





10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 05, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010610**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 24 sample(s) on Jan 15, 2018 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: Dayna.Fisher
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010610

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010610-01	17SS101-5.0-7.0	Soil		12-Jan-2018 14:40	15-Jan-2018 09:15	☐
HS18010610-02	17SS102-0.0-2.0	Soil		12-Jan-2018 14:45	15-Jan-2018 09:15	☐
HS18010610-03	17SS102-2.5-4.5	Soil		12-Jan-2018 14:47	15-Jan-2018 09:15	☐
HS18010610-04	17SS102-5.0-7.0	Soil		12-Jan-2018 14:49	15-Jan-2018 09:15	☐
HS18010610-05	17SS100-0.0-2.0	Soil		12-Jan-2018 14:55	15-Jan-2018 09:15	☐
HS18010610-06	17SS100-2.5-4.5	Soil		12-Jan-2018 14:57	15-Jan-2018 09:15	☐
HS18010610-07	17SS100-5.0-7.0	Soil		12-Jan-2018 15:00	15-Jan-2018 09:15	☐
HS18010610-08	17SS103-0.0-2.0	Soil		12-Jan-2018 15:05	15-Jan-2018 09:15	☐
HS18010610-09	17SS103-2.5-4.5	Soil		12-Jan-2018 15:07	15-Jan-2018 09:15	☐
HS18010610-10	COE17-15A-4.0-5.0	Soil		12-Jan-2018 15:15	15-Jan-2018 09:15	☐
HS18010610-11	COE17-15A-5.0-7.0	Soil		12-Jan-2018 15:17	15-Jan-2018 09:15	☐
HS18010610-12	17SS105-0.0-2.0	Soil		12-Jan-2018 15:21	15-Jan-2018 09:15	☐
HS18010610-13	17SS105-2.5-4.5	Soil		12-Jan-2018 15:23	15-Jan-2018 09:15	☐
HS18010610-14	17SB06A-7.5-9.5	Soil		12-Jan-2018 16:05	15-Jan-2018 09:15	☐
HS18010610-15	17SB06A-10.0-12.0	Soil		12-Jan-2018 16:07	15-Jan-2018 09:15	☐
HS18010610-16	17SB06A-12.5-14.5	Soil		12-Jan-2018 16:09	15-Jan-2018 09:15	☐
HS18010610-17	COE17-16A-4.0-5.0	Soil		12-Jan-2018 16:20	15-Jan-2018 09:15	☐
HS18010610-18	COE17-16A-5.0-7.0	Soil		12-Jan-2018 16:22	15-Jan-2018 09:15	☐
HS18010610-19	17SS125-0.0-2.0	Soil		12-Jan-2018 16:28	15-Jan-2018 09:15	☐
HS18010610-20	17SS125-2.5-4.5	Soil		12-Jan-2018 16:30	15-Jan-2018 09:15	☐
HS18010610-21	17SS125-5.0-7.0	Soil		12-Jan-2018 16:32	15-Jan-2018 09:15	☐
HS18010610-22	17SS126-0.0-2.0	Soil		12-Jan-2018 16:37	15-Jan-2018 09:15	☐
HS18010610-23	17SS126-2.5-4.5	Soil		12-Jan-2018 16:39	15-Jan-2018 09:15	☐
HS18010610-24	17SS126-5.0-7.0	Soil		12-Jan-2018 16:41	15-Jan-2018 09:15	☐

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.**CASE NARRATIVE****Project:** Longhorn Army Ammunition Plant**Work Order:** HS18010610

HPLC by Method SW8330**Batch ID: 124532,124568**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method ASTM D2216**Batch ID: R309525,R309527**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.
-

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS101-5.0-7.0
 Collection Date: 12-Jan-2018 14:40

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.9	U	6.54	32.9	79.1	ug/Kg-dry	1	27-Jan-2018 18:07
2,4-Dinitrotoluene	32.9	U	5.85	32.9	79.1	ug/Kg-dry	1	27-Jan-2018 18:07
2,6-Dinitrotoluene	32.9	U	14.2	32.9	79.1	ug/Kg-dry	1	27-Jan-2018 18:07
<i>Surr: 1,2-Dinitrobenzene</i>	72.6			0	50-150	%REC	1	27-Jan-2018 18:07
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	24.5		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS102-0.0-2.0
 Collection Date: 12-Jan-2018 14:45

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.1	U	5.77	29.1	69.8	ug/Kg-dry	1	27-Jan-2018 18:42
2,4-Dinitrotoluene	29.1	U	5.17	29.1	69.8	ug/Kg-dry	1	27-Jan-2018 18:42
2,6-Dinitrotoluene	29.1	U	12.6	29.1	69.8	ug/Kg-dry	1	27-Jan-2018 18:42
<i>Surr: 1,2-Dinitrobenzene</i>	72.9			0	50-150	%REC	1	27-Jan-2018 18:42
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.0		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS102-2.5-4.5
 Collection Date: 12-Jan-2018 14:47

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-03
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.6	U	6.07	30.6	73.4	ug/Kg-dry	1	27-Jan-2018 20:30
2,4-Dinitrotoluene	30.6	U	5.43	30.6	73.4	ug/Kg-dry	1	27-Jan-2018 20:30
2,6-Dinitrotoluene	30.6	U	13.2	30.6	73.4	ug/Kg-dry	1	27-Jan-2018 20:30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>75.0</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>27-Jan-2018 20:30</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS102-5.0-7.0
 Collection Date: 12-Jan-2018 14:49

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-04
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.0	U	5.96	30.0	72.1	ug/Kg-dry	1	27-Jan-2018 21:06
2,4-Dinitrotoluene	30.0	U	5.33	30.0	72.1	ug/Kg-dry	1	27-Jan-2018 21:06
2,6-Dinitrotoluene	30.0	U	13.0	30.0	72.1	ug/Kg-dry	1	27-Jan-2018 21:06
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.9</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>27-Jan-2018 21:06</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS100-0.0-2.0
 Collection Date: 12-Jan-2018 14:55

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-05
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.5	U	5.86	29.5	70.8	ug/Kg-dry	1	27-Jan-2018 21:42
2,4-Dinitrotoluene	29.5	U	5.24	29.5	70.8	ug/Kg-dry	1	27-Jan-2018 21:42
2,6-Dinitrotoluene	29.5	U	12.8	29.5	70.8	ug/Kg-dry	1	27-Jan-2018 21:42
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>27-Jan-2018 21:42</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS100-2.5-4.5
 Collection Date: 12-Jan-2018 14:57

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-06
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.8	U	5.91	29.8	71.5	ug/Kg-dry	1	27-Jan-2018 22:17
2,4-Dinitrotoluene	29.8	U	5.29	29.8	71.5	ug/Kg-dry	1	27-Jan-2018 22:17
2,6-Dinitrotoluene	29.8	U	12.9	29.8	71.5	ug/Kg-dry	1	27-Jan-2018 22:17
<i>Surr: 1,2-Dinitrobenzene</i>	72.8			0	50-150	%REC	1	27-Jan-2018 22:17
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS100-5.0-7.0
 Collection Date: 12-Jan-2018 15:00

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-07
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.2	U	6.00	30.2	72.5	ug/Kg-dry	1	27-Jan-2018 22:53
2,4-Dinitrotoluene	30.2	U	5.37	30.2	72.5	ug/Kg-dry	1	27-Jan-2018 22:53
2,6-Dinitrotoluene	30.2	U	13.1	30.2	72.5	ug/Kg-dry	1	27-Jan-2018 22:53
<i>Surr: 1,2-Dinitrobenzene</i>	73.2			0	50-150	%REC	1	27-Jan-2018 22:53
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS103-0.0-2.0
 Collection Date: 12-Jan-2018 15:05

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-08
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	707		5.61	28.3	67.9	ug/Kg-dry	1	27-Jan-2018 23:29
2,4-Dinitrotoluene	1,720		5.02	28.3	67.9	ug/Kg-dry	1	27-Jan-2018 23:29
2,6-Dinitrotoluene	3,750		12.2	28.3	67.9	ug/Kg-dry	1	27-Jan-2018 23:29
Surr: 1,2-Dinitrobenzene	78.4			0	50-150	%REC	1	27-Jan-2018 23:29
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS103-2.5-4.5
 Collection Date: 12-Jan-2018 15:07

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-09
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	27.6	U	5.48	27.6	66.3	ug/Kg-dry	1	28-Jan-2018 01:17
2,4-Dinitrotoluene	27.6	U	4.91	27.6	66.3	ug/Kg-dry	1	28-Jan-2018 01:17
2,6-Dinitrotoluene	27.6	U	11.9	27.6	66.3	ug/Kg-dry	1	28-Jan-2018 01:17
<i>Surr: 1,2-Dinitrobenzene</i>	72.5			0	50-150	%REC	1	28-Jan-2018 01:17
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	13.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-15A-4.0-5.0
 Collection Date: 12-Jan-2018 15:15

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-10
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.8	U	6.12	30.8	74.0	ug/Kg-dry	1	28-Jan-2018 12:38
2,4-Dinitrotoluene	30.8	U	5.47	30.8	74.0	ug/Kg-dry	1	28-Jan-2018 12:38
2,6-Dinitrotoluene	30.8	U	13.3	30.8	74.0	ug/Kg-dry	1	28-Jan-2018 12:38
<i>Surr: 1,2-Dinitrobenzene</i>	<i>73.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 12:38</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-15A-5.0-7.0
 Collection Date: 12-Jan-2018 15:17

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-11
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.5	U	6.26	31.5	75.7	ug/Kg-dry	1	28-Jan-2018 02:28
2,4-Dinitrotoluene	31.5	U	5.60	31.5	75.7	ug/Kg-dry	1	28-Jan-2018 02:28
2,6-Dinitrotoluene	31.5	U	13.6	31.5	75.7	ug/Kg-dry	1	28-Jan-2018 02:28
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 02:28</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.1		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS105-0.0-2.0
 Collection Date: 12-Jan-2018 15:21

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-12
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 22-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	2,390		6.36	32.1	77.0	ug/Kg-dry	1	28-Jan-2018 03:04
2,4-Dinitrotoluene	88.0		5.70	32.1	77.0	ug/Kg-dry	1	28-Jan-2018 03:04
2,6-Dinitrotoluene	92.5		13.9	32.1	77.0	ug/Kg-dry	1	28-Jan-2018 03:04
Surr: 1,2-Dinitrobenzene	75.9			0	50-150	%REC	1	28-Jan-2018 03:04
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	23.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS105-2.5-4.5
 Collection Date: 12-Jan-2018 15:23

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-13
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	33.5	U	6.65	33.5	80.5	ug/Kg-dry	1	28-Jan-2018 06:04
2,4-Dinitrotoluene	33.5	U	5.95	33.5	80.5	ug/Kg-dry	1	28-Jan-2018 06:04
2,6-Dinitrotoluene	33.5	U	14.5	33.5	80.5	ug/Kg-dry	1	28-Jan-2018 06:04
<i>Surr: 1,2-Dinitrobenzene</i>	76.3			0	50-150	%REC	1	28-Jan-2018 06:04
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	25.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB06A-7.5-9.5
 Collection Date: 12-Jan-2018 16:05

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-14
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.0	U	5.75	29.0	69.5	ug/Kg-dry	1	28-Jan-2018 06:39
2,4-Dinitrotoluene	29.0	U	5.14	29.0	69.5	ug/Kg-dry	1	28-Jan-2018 06:39
2,6-Dinitrotoluene	29.0	U	12.5	29.0	69.5	ug/Kg-dry	1	28-Jan-2018 06:39
<i>Surr: 1,2-Dinitrobenzene</i>	<i>72.4</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 06:39</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 14:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB06A-10.0-12.0
 Collection Date: 12-Jan-2018 16:07

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-15
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.8	U	5.72	28.8	69.1	ug/Kg-dry	1	28-Jan-2018 07:15
2,4-Dinitrotoluene	28.8	U	5.12	28.8	69.1	ug/Kg-dry	1	28-Jan-2018 07:15
2,6-Dinitrotoluene	28.8	U	12.4	28.8	69.1	ug/Kg-dry	1	28-Jan-2018 07:15
<i>Surr: 1,2-Dinitrobenzene</i>	<i>75.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 07:15</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.5		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SB06A-12.5-14.5
 Collection Date: 12-Jan-2018 16:09

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-16
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	727		6.38	32.2	77.2	ug/Kg-dry	1	28-Jan-2018 07:51
2,4-Dinitrotoluene	488		5.71	32.2	77.2	ug/Kg-dry	1	28-Jan-2018 07:51
2,6-Dinitrotoluene	1,960		13.9	32.2	77.2	ug/Kg-dry	1	28-Jan-2018 07:51
Surr: 1,2-Dinitrobenzene	76.9			0	50-150	%REC	1	28-Jan-2018 07:51
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	22.3		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-16A-4.0-5.0
 Collection Date: 12-Jan-2018 16:20

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-17
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	183		6.00	30.3	72.6	ug/Kg-dry	1	28-Jan-2018 08:27
2,4-Dinitrotoluene	39.3	J	5.37	30.3	72.6	ug/Kg-dry	1	28-Jan-2018 08:27
2,6-Dinitrotoluene	30.3	U	13.1	30.3	72.6	ug/Kg-dry	1	28-Jan-2018 08:27
Surr: 1,2-Dinitrobenzene	74.2			0	50-150	%REC	1	28-Jan-2018 08:27
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	17.8		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-16A-5.0-7.0
 Collection Date: 12-Jan-2018 16:22

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-18
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	31.4	U	6.22	31.4	75.3	ug/Kg-dry	1	28-Jan-2018 09:03
2,4-Dinitrotoluene	31.4	U	5.57	31.4	75.3	ug/Kg-dry	1	28-Jan-2018 09:03
2,6-Dinitrotoluene	31.4	U	13.5	31.4	75.3	ug/Kg-dry	1	28-Jan-2018 09:03
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.3</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 09:03</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	23.7		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS125-0.0-2.0
 Collection Date: 12-Jan-2018 16:28

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-19
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.6	U	5.87	29.6	71.0	ug/Kg-dry	1	28-Jan-2018 09:39
2,4-Dinitrotoluene	29.6	U	5.26	29.6	71.0	ug/Kg-dry	1	28-Jan-2018 09:39
2,6-Dinitrotoluene	29.6	U	12.8	29.6	71.0	ug/Kg-dry	1	28-Jan-2018 09:39
<i>Surr: 1,2-Dinitrobenzene</i>	<i>74.5</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 09:39</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS125-2.5-4.5
 Collection Date: 12-Jan-2018 16:30

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-20
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.0	U	5.95	30.0	71.9	ug/Kg-dry	1	28-Jan-2018 10:14
2,4-Dinitrotoluene	30.0	U	5.32	30.0	71.9	ug/Kg-dry	1	28-Jan-2018 10:14
2,6-Dinitrotoluene	30.0	U	12.9	30.0	71.9	ug/Kg-dry	1	28-Jan-2018 10:14
<i>Surr: 1,2-Dinitrobenzene</i>	<i>77.2</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 10:14</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.4		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS125-5.0-7.0
 Collection Date: 12-Jan-2018 16:32

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-21
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.5	U	5.65	28.5	68.3	ug/Kg-dry	1	28-Jan-2018 12:02
2,4-Dinitrotoluene	28.5	U	5.06	28.5	68.3	ug/Kg-dry	1	28-Jan-2018 12:02
2,6-Dinitrotoluene	28.5	U	12.3	28.5	68.3	ug/Kg-dry	1	28-Jan-2018 12:02
<i>Surr: 1,2-Dinitrobenzene</i>	75.9			0	50-150	%REC	1	28-Jan-2018 12:02
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	13.9		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS126-0.0-2.0
 Collection Date: 12-Jan-2018 16:37

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-22
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.1	U	5.98	30.1	72.3	ug/Kg-dry	1	28-Jan-2018 13:14
2,4-Dinitrotoluene	30.1	U	5.35	30.1	72.3	ug/Kg-dry	1	28-Jan-2018 13:14
2,6-Dinitrotoluene	30.1	U	13.0	30.1	72.3	ug/Kg-dry	1	28-Jan-2018 13:14
<i>Surr: 1,2-Dinitrobenzene</i>	75.3			0	50-150	%REC	1	28-Jan-2018 13:14
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.2		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS126-2.5-4.5
 Collection Date: 12-Jan-2018 16:39

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-23
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.8	U	5.72	28.8	69.1	ug/Kg-dry	1	28-Jan-2018 13:50
2,4-Dinitrotoluene	28.8	U	5.12	28.8	69.1	ug/Kg-dry	1	28-Jan-2018 13:50
2,6-Dinitrotoluene	28.8	U	12.4	28.8	69.1	ug/Kg-dry	1	28-Jan-2018 13:50
<i>Surr: 1,2-Dinitrobenzene</i>	<i>76.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 13:50</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.5		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS126-5.0-7.0
 Collection Date: 12-Jan-2018 16:41

ANALYTICAL REPORT

WorkOrder:HS18010610
 Lab ID:HS18010610-24
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.9	U	5.73	28.9	69.3	ug/Kg-dry	1	28-Jan-2018 14:25
2,4-Dinitrotoluene	28.9	U	5.13	28.9	69.3	ug/Kg-dry	1	28-Jan-2018 14:25
2,6-Dinitrotoluene	28.9	U	12.5	28.9	69.3	ug/Kg-dry	1	28-Jan-2018 14:25
<i>Surr: 1,2-Dinitrobenzene</i>	76.4			0	50-150	%REC	1	28-Jan-2018 14:25
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.6		0.0100	0.0100	0.0100	wt%	1	24-Jan-2018 15:20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010610**Batch ID:** 124532 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010610-01	1	2.01	10 (mL)	4.975
HS18010610-02	1	2.07	10 (mL)	4.831
HS18010610-03	1	2.01	10 (mL)	4.975
HS18010610-04	1	2.04	10 (mL)	4.902
HS18010610-05	1	2	10 (mL)	5
HS18010610-06	1	2.08	10 (mL)	4.808
HS18010610-07	1	2.01	10 (mL)	4.975
HS18010610-08	1	2.06	10 (mL)	4.854
HS18010610-09	1	2.09	10 (mL)	4.785
HS18010610-10	1	2.02	10 (mL)	4.95
HS18010610-11	1	2.01	10 (mL)	4.975
HS18010610-12	1	2.03	10 (mL)	4.926

Batch ID: 124568 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010610-13	1	2.01	10 (mL)	4.975
HS18010610-14	1	2.06	10 (mL)	4.854
HS18010610-15	1	2.03	10 (mL)	4.926
HS18010610-16	1	2	10 (mL)	5
HS18010610-17	1	2.01	10 (mL)	4.975
HS18010610-18	1	2.09	10 (mL)	4.785
HS18010610-19	1	2.05	10 (mL)	4.878
HS18010610-20	1	2.02	10 (mL)	4.95
HS18010610-21	1	2.04	10 (mL)	4.902
HS18010610-22	1	2.08	10 (mL)	4.808
HS18010610-23	1	2.03	10 (mL)	4.926
HS18010610-24	1	2.1	10 (mL)	4.762

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010610

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124532	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010610-01	17SS101-5.0-7.0	12 Jan 2018 14:40		22 Jan 2018 17:55	27 Jan 2018 18:07	1
HS18010610-02	17SS102-0.0-2.0	12 Jan 2018 14:45		22 Jan 2018 17:55	27 Jan 2018 18:42	1
HS18010610-03	17SS102-2.5-4.5	12 Jan 2018 14:47		22 Jan 2018 17:55	27 Jan 2018 20:30	1
HS18010610-04	17SS102-5.0-7.0	12 Jan 2018 14:49		22 Jan 2018 17:55	27 Jan 2018 21:06	1
HS18010610-05	17SS100-0.0-2.0	12 Jan 2018 14:55		22 Jan 2018 17:55	27 Jan 2018 21:42	1
HS18010610-06	17SS100-2.5-4.5	12 Jan 2018 14:57		22 Jan 2018 17:55	27 Jan 2018 22:17	1
HS18010610-07	17SS100-5.0-7.0	12 Jan 2018 15:00		22 Jan 2018 17:55	27 Jan 2018 22:53	1
HS18010610-08	17SS103-0.0-2.0	12 Jan 2018 15:05		22 Jan 2018 17:55	27 Jan 2018 23:29	1
HS18010610-09	17SS103-2.5-4.5	12 Jan 2018 15:07		22 Jan 2018 17:55	28 Jan 2018 01:17	1
HS18010610-10	COE17-15A-4.0-5.0	12 Jan 2018 15:15		22 Jan 2018 17:55	28 Jan 2018 12:38	1
HS18010610-11	COE17-15A-5.0-7.0	12 Jan 2018 15:17		22 Jan 2018 17:55	28 Jan 2018 02:28	1
HS18010610-12	17SS105-0.0-2.0	12 Jan 2018 15:21		22 Jan 2018 17:55	28 Jan 2018 03:04	1
Batch ID 124568	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010610-13	17SS105-2.5-4.5	12 Jan 2018 15:23		23 Jan 2018 18:16	28 Jan 2018 06:04	1
HS18010610-14	17SB06A-7.5-9.5	12 Jan 2018 16:05		23 Jan 2018 18:16	28 Jan 2018 06:39	1
HS18010610-15	17SB06A-10.0-12.0	12 Jan 2018 16:07		23 Jan 2018 18:16	28 Jan 2018 07:15	1
HS18010610-16	17SB06A-12.5-14.5	12 Jan 2018 16:09		23 Jan 2018 18:16	28 Jan 2018 07:51	1
HS18010610-17	COE17-16A-4.0-5.0	12 Jan 2018 16:20		23 Jan 2018 18:16	28 Jan 2018 08:27	1
HS18010610-18	COE17-16A-5.0-7.0	12 Jan 2018 16:22		23 Jan 2018 18:16	28 Jan 2018 09:03	1
HS18010610-19	17SS125-0.0-2.0	12 Jan 2018 16:28		23 Jan 2018 18:16	28 Jan 2018 09:39	1
HS18010610-20	17SS125-2.5-4.5	12 Jan 2018 16:30		23 Jan 2018 18:16	28 Jan 2018 10:14	1
HS18010610-21	17SS125-5.0-7.0	12 Jan 2018 16:32		23 Jan 2018 18:16	28 Jan 2018 12:02	1
HS18010610-22	17SS126-0.0-2.0	12 Jan 2018 16:37		23 Jan 2018 18:16	28 Jan 2018 13:14	1
HS18010610-23	17SS126-2.5-4.5	12 Jan 2018 16:39		23 Jan 2018 18:16	28 Jan 2018 13:50	1
HS18010610-24	17SS126-5.0-7.0	12 Jan 2018 16:41		23 Jan 2018 18:16	28 Jan 2018 14:25	1

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010610

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID	R309525	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010610-01	17SS101-5.0-7.0	12 Jan 2018 14:40			24 Jan 2018 14:54	1
HS18010610-02	17SS102-0.0-2.0	12 Jan 2018 14:45			24 Jan 2018 14:54	1
HS18010610-03	17SS102-2.5-4.5	12 Jan 2018 14:47			24 Jan 2018 14:54	1
HS18010610-04	17SS102-5.0-7.0	12 Jan 2018 14:49			24 Jan 2018 14:54	1
HS18010610-05	17SS100-0.0-2.0	12 Jan 2018 14:55			24 Jan 2018 14:54	1
HS18010610-06	17SS100-2.5-4.5	12 Jan 2018 14:57			24 Jan 2018 14:54	1
HS18010610-07	17SS100-5.0-7.0	12 Jan 2018 15:00			24 Jan 2018 14:54	1
HS18010610-08	17SS103-0.0-2.0	12 Jan 2018 15:05			24 Jan 2018 14:54	1
HS18010610-09	17SS103-2.5-4.5	12 Jan 2018 15:07			24 Jan 2018 14:54	1
HS18010610-10	COE17-15A-4.0-5.0	12 Jan 2018 15:15			24 Jan 2018 14:54	1
HS18010610-11	COE17-15A-5.0-7.0	12 Jan 2018 15:17			24 Jan 2018 14:54	1
HS18010610-12	17SS105-0.0-2.0	12 Jan 2018 15:21			24 Jan 2018 14:54	1
HS18010610-13	17SS105-2.5-4.5	12 Jan 2018 15:23			24 Jan 2018 14:54	1
HS18010610-14	17SB06A-7.5-9.5	12 Jan 2018 16:05			24 Jan 2018 14:54	1
Batch ID	R309527	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010610-15	17SB06A-10.0-12.0	12 Jan 2018 16:07			24 Jan 2018 15:20	1
HS18010610-16	17SB06A-12.5-14.5	12 Jan 2018 16:09			24 Jan 2018 15:20	1
HS18010610-17	COE17-16A-4.0-5.0	12 Jan 2018 16:20			24 Jan 2018 15:20	1
HS18010610-18	COE17-16A-5.0-7.0	12 Jan 2018 16:22			24 Jan 2018 15:20	1
HS18010610-19	17SS125-0.0-2.0	12 Jan 2018 16:28			24 Jan 2018 15:20	1
HS18010610-20	17SS125-2.5-4.5	12 Jan 2018 16:30			24 Jan 2018 15:20	1
HS18010610-21	17SS125-5.0-7.0	12 Jan 2018 16:32			24 Jan 2018 15:20	1
HS18010610-22	17SS126-0.0-2.0	12 Jan 2018 16:37			24 Jan 2018 15:20	1
HS18010610-23	17SS126-2.5-4.5	12 Jan 2018 16:39			24 Jan 2018 15:20	1
HS18010610-24	17SS126-5.0-7.0	12 Jan 2018 16:41			24 Jan 2018 15:20	1

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010610

QC BATCH REPORT

Batch ID: 124532		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124532	Units: ug/Kg		Analysis Date: 27-Jan-2018 07:03					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408381		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>918.3</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.5</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124532	Units: ug/Kg		Analysis Date: 27-Jan-2018 07:38					
Client ID:	Run ID: HPLC3_309693	SeqNo: 4408382		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1039	60.0	1250	0	83.1	75 - 125			
2,4-Dinitrotoluene	1205	60.0	1250	0	96.4	82 - 123			
2,6-Dinitrotoluene	1190	60.0	1250	0	95.2	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>932.8</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>74.6</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010610-02MS	Units: ug/Kg		Analysis Date: 27-Jan-2018 19:18					
Client ID: 17SS102-0.0-2.0	Run ID: HPLC3_309693	SeqNo: 4408397		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1042	58.3	1214	0	85.9	75 - 125			
2,4-Dinitrotoluene	1151	58.3	1214	0	94.9	82 - 123			
2,6-Dinitrotoluene	1130	58.3	1214	0	93.1	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>921.3</i>	<i>58.3</i>	<i>1214</i>	<i>0</i>	<i>75.9</i>	<i>50 - 150</i>			

MSD	Sample ID: HS18010610-02MSD	Units: ug/Kg		Analysis Date: 27-Jan-2018 19:54					
Client ID: 17SS102-0.0-2.0	Run ID: HPLC3_309693	SeqNo: 4408398		PrepDate: 22-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1058	59.1	1232	0	85.9	75 - 125	1042	1.47	30
2,4-Dinitrotoluene	1186	59.1	1232	0	96.3	82 - 123	1151	2.93	30
2,6-Dinitrotoluene	1161	59.1	1232	0	94.3	86 - 119	1130	2.72	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>936</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>76.0</i>	<i>50 - 150</i>	<i>921.3</i>	<i>1.58</i>	<i>30</i>

The following samples were analyzed in this batch:									
HS18010610-01		HS18010610-02		HS18010610-03		HS18010610-04			
HS18010610-05		HS18010610-06		HS18010610-07		HS18010610-08			
HS18010610-09		HS18010610-10		HS18010610-11		HS18010610-12			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010610

QC BATCH REPORT

Batch ID: 124568		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124568	Units: ug/Kg		Analysis Date: 28-Jan-2018 04:52					
Client ID:	Run ID: HPLC3_309714	SeqNo: 4408807		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>921.1</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.7</i>	<i>50 - 150</i>			

LCS	Sample ID: LCS-124568	Units: ug/Kg		Analysis Date: 28-Jan-2018 05:28					
Client ID:	Run ID: HPLC3_309714	SeqNo: 4408808		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1037	60.0	1250	0	83.0	75 - 125			
2,4-Dinitrotoluene	1207	60.0	1250	0	96.5	82 - 123			
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>935.5</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>74.8</i>	<i>50 - 150</i>			

MS	Sample ID: HS18010694-25MS	Units: ug/Kg		Analysis Date: 28-Jan-2018 22:51					
Client ID:	Run ID: HPLC3_309714	SeqNo: 4418714		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1104	59.7	1244	0	88.8	75 - 125			
2,4-Dinitrotoluene	1319	59.7	1244	59.07	101	82 - 123			
2,6-Dinitrotoluene	1247	59.7	1244	0	100	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>961.3</i>	<i>59.7</i>	<i>1244</i>	<i>0</i>	<i>77.3</i>	<i>50 - 150</i>			

MSD	Sample ID: HS18010694-25MSD	Units: ug/Kg		Analysis Date: 28-Jan-2018 23:27					
Client ID:	Run ID: HPLC3_309714	SeqNo: 4418715		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1081	59.1	1232	0	87.8	75 - 125	1104	2.08	30
2,4-Dinitrotoluene	1310	59.1	1232	59.07	102	82 - 123	1319	0.661	30
2,6-Dinitrotoluene	1241	59.1	1232	0	101	86 - 119	1247	0.504	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>955.7</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>77.6</i>	<i>50 - 150</i>	<i>961.3</i>	<i>0.588</i>	<i>30</i>

The following samples were analyzed in this batch:									
HS18010610-13		HS18010610-14		HS18010610-15		HS18010610-16			
HS18010610-17		HS18010610-18		HS18010610-19		HS18010610-20			
HS18010610-21		HS18010610-22		HS18010610-23		HS18010610-24			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010610

QC BATCH REPORT

Batch ID: R309525		Instrument: Balance1		Method: ASTM D2216					
DUP	Sample ID: HS18010605-24DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:54					
Client ID:	Run ID: Balance1_309525	SeqNo: 4404747		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	18.6	0.0100					19.3	3.69	20

DUP	Sample ID: HS18010605-23DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:54					
Client ID:	Run ID: Balance1_309525	SeqNo: 4404732		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	11.4	0.0100					12.2	6.78	20

DUP	Sample ID: HS18010605-22DUP	Units: wt%		Analysis Date: 24-Jan-2018 14:54					
Client ID:	Run ID: Balance1_309525	SeqNo: 4404731		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Percent Moisture	13.1	0.0100					12.3	6.3	20

The following samples were analyzed in this batch:				HS18010610-01	HS18010610-02	HS18010610-03	HS18010610-04
				HS18010610-05	HS18010610-06	HS18010610-07	HS18010610-08
				HS18010610-09	HS18010610-10	HS18010610-11	HS18010610-12
				HS18010610-13	HS18010610-14		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010610

QC BATCH REPORT

Batch ID: R309527		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010610-23DUP	Units: wt%		Analysis Date: 24-Jan-2018 15:20	
Client ID: 17SS126-2.5-4.5	Run ID: Balance1_309527		SeqNo: 4404785	PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	14	0.0100			14.5 3.51 20

The following samples were analyzed in this batch:

HS18010610-15	HS18010610-16	HS18010610-17	HS18010610-18
HS18010610-19	HS18010610-20	HS18010610-21	HS18010610-22
HS18010610-23	HS18010610-24		

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010610

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group USA, Corp

Date: 05-Feb-18

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS18010610

Date/Time Received: **15-Jan-2018 09:15**
 Received by: **JRM**

Checklist completed by: Paresh M. Giga 16-Jan-2018 Reviewed by: RJ Modashia 17-Jan-2018
 eSignature Date eSignature Date

Matrices: **Soil**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.7c/0.2c;0.6c/0.1c;0.9c/0.4c;0.7c/0.2c U/C IR11
 Cooler(s)/Kit(s): 42760;24765;23880;3333
 Date/Time sample(s) sent to storage: 1/16/17 1540

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:



00899179

Page 7 of 8

COC ID: 17-JAN2018-SO-ALSHT-011218		TURNAROUND TIME: normal				RUSH:											
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO							
Facility Name	Longhorn AAP					Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com						
Project Number	501032					Lab Contact	Sonia West										
	LHAAP-17					Email	Sonia.West@alsglobal.com			Email Report To	Sharon.Pennington@CBIFederalServices.com						
Address	1203-B East Grand Avenue					Address	10450 Stanciliff Rd., Suite 210			Mail Reports To	Sharon Pennington						
	PMB 202									Address	2410 Cherahala Blvd.						
City	Marshall	State	TX			City	Houston	State	TX	City	Knoxville	State	TN				
Postal Code	75670	Country	USA			Postal Code	77099	Country	USA	Postal Code	37932	Country	USA				
Phone Number	713.243.7264					Phone Number	281.575.2132 or 281.530.5656										
Project Manager	Praveen Srivastav									Shipping Company	FedEx						
SAMPLE DETAILS									ANALYSIS REQUESTED								
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330								
17SS101-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1440	1	X								
17SS102-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1445	1	X								
17SS102-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1447	1	X								
17SS102-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1449	1	X								
17SS100-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1455	1	X								
17SS100-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1457	1	X								
17SS100-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1500	1	X								
17SS103-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1505	1	X								
17SS103-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1507	1	X								
COE17-15A-4.0-5.0	LHAAP-17	4	5	FT	SO	1/12/2018	1515	1	X								
COE17-15A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1517	1	X								
17SS105-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1521	1	X								
17SS105-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1523	1	X								
17SB06A-7.5-9.5	LHAAP-17	7.5	9.5	FT	SO	1/12/2018	1605	1	X								
17SB06A-10.0-12.0	LHAAP-17	10	12	FT	SO	1/12/2018	1607	1	X								
17SB06A-12.5-14.5	LHAAP-17	12.5	14.5	FT	SO	1/12/2018	1609	1	X								
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS						RELINQUISHED BY/AFFILIATION		DATE/TIME	ACCEPTED BY/AFFILIATION		DATE/TIME						
						D. Rowan		1/12/18	Jm		1-15-18 09:15						
						DAVID ROWAN		1/12/18									

		Page <u>8</u> of <u>8</u>													
COC ID:		17-JAN2018-SO-ALSHT-011218				TURNAROUND TIME: normal				RUSH:					
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO					
Facility Name		Longhorn AAP				Lab Name		ALS Laboratories		Email Invoice To		FedInvoices@CBIFederalServices.com			
Project Number		501032				Lab Contact		Sonia West		Email Report To		Sharon.Pennington@CBIFederalServices.com			
Address		LHAAP-17 1203-B East Grand Avenue PMB 202				Email		Sonia.West@alsglobal.com		Mail Reports To		Sharon Pennington			
City		Marshall		State TX		City		Houston		State TX		City Knoxville		State TN	
Postal Code		75670		Country USA		Postal Code		77099		Country USA		Postal Code		37932	
Phone Number		713.243.7264				Phone Number		281.575.2132 or 281.530.5656				Shipping Company		FedEx	
Project Manager		Praveen Srivastav													
SAMPLE DETAILS									ANALYSIS REQUESTED						
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS 2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330						
COE17-16A-4.0-5.0	LHAAP-17	4	5	FT	SO	1/12/2018	1620	1	X						
COE17-16A-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1622	1	X						
17SS125-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1628	1	X						
17SS125-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1630	1	X						
17SS125-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1632	1	X						
17SS126-0.0-2.0	LHAAP-17	0	2	FT	SO	1/12/2018	1637	1	X						
17SS126-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/12/2018	1639	1	X						
17SS126-5.0-7.0	LHAAP-17	5	7	FT	SO	1/12/2018	1641	1	X						
								1	X						
								1	X						
								1	X						
								1	X						
								1	X						
								1	X						
								1	X						
								1	X						
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS				RELINQUISHED BY/AFFILIATION			DATE/TIME		ACCEPTED BY/AFFILIATION			DATE/TIME			
				David R			1/12/18		Jm			1.12.18 09:15			
							1900								

HS18010610
 Aptim Environmental & Infrastructure, Inc.
 Longhorn Army Ammunition Plant



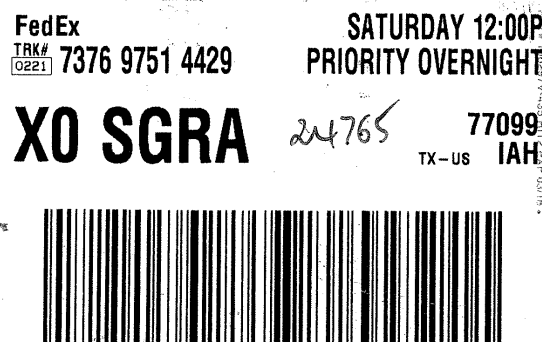
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DATE: 1/12/18
Signature: DN
42760 LIAAP

42760 JAN 15 2018



CUSTODY SEAL SM 01/15/18
DATE: 1/12/18
Signature: 19
24765 LHAAP

24765 JAN 15 2018



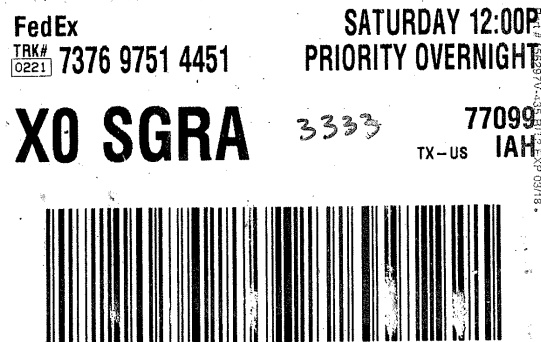
CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *DN*
23880 LHAAP

23880 JAN 15 2018



3333 JAN 15 2018

CUSTODY SEAL *sm*
DATE: 1/12/18 *01/15/18*
Signature: *DN*
3333 LHAAP





10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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February 05, 2018

Jennifer Hoang
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18010694**

Laboratory Results for: **Longhorn Army Ammunition Plant**

Dear Jennifer,

ALS Environmental received 35 sample(s) on Jan 17, 2018 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: Dayna.Fisher
RJ Modashia
Project Manager

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010694

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010694-01	17SS59-0.0-0.5	Soil		13-Jan-2018 11:38	17-Jan-2018 10:00	☐
HS18010694-02	17SS57-0.0-0.5	Soil		13-Jan-2018 11:40	17-Jan-2018 10:00	☐
HS18010694-03	17SS56-0.0-0.5	Soil		13-Jan-2018 11:48	17-Jan-2018 10:00	☐
HS18010694-04	17SS58-0.0-0.5	Soil		13-Jan-2018 11:55	17-Jan-2018 10:00	☐
HS18010694-05	17SS60-0.0-2.0	Soil		13-Jan-2018 12:05	17-Jan-2018 10:00	☐
HS18010694-06	17SS61-0.0-2.0	Soil		13-Jan-2018 12:15	17-Jan-2018 10:00	☐
HS18010694-07	17SS61-0.0-2.0-FD	Soil		13-Jan-2018 12:15	17-Jan-2018 10:00	☐
HS18010694-08	17SS55-0.0-0.5	Soil		13-Jan-2018 13:50	17-Jan-2018 10:00	☐
HS18010694-09	17SS53-0.0-0.5	Soil		13-Jan-2018 13:55	17-Jan-2018 10:00	☐
HS18010694-10	17SS54-0.0-0.5	Soil		13-Jan-2018 14:00	17-Jan-2018 10:00	☐
HS18010694-11	17SS52-0.0-0.5	Soil		13-Jan-2018 14:05	17-Jan-2018 10:00	☐
HS18010694-12	17SS104-0.0-2.0	Soil		13-Jan-2018 16:00	17-Jan-2018 10:00	☐
HS18010694-13	17SS104-2.5-4.5	Soil		13-Jan-2018 16:05	17-Jan-2018 10:00	☐
HS18010694-14	17SS08-0.0-2.0	Soil		13-Jan-2018 16:15	17-Jan-2018 10:00	☐
HS18010694-15	17SS48-0.0-0.5	Soil		14-Jan-2018 10:20	17-Jan-2018 10:00	☐
HS18010694-16	17SS49-0.0-0.5	Soil		14-Jan-2018 10:25	17-Jan-2018 10:00	☐
HS18010694-17	17SS50-0.0-0.5	Soil		14-Jan-2018 10:30	17-Jan-2018 10:00	☐
HS18010694-18	17SS51-0.0-0.5	Soil		14-Jan-2018 10:35	17-Jan-2018 10:00	☐
HS18010694-19	17SS106-0.0-2.0	Soil		14-Jan-2018 10:50	17-Jan-2018 10:00	☐
HS18010694-20	17SS107-0.0-2.0	Soil		14-Jan-2018 11:00	17-Jan-2018 10:00	☐
HS18010694-21	17SS96-0.0-2.0	Soil		14-Jan-2018 11:20	17-Jan-2018 10:00	☐
HS18010694-22	17SS95-0.0-2.0	Soil		14-Jan-2018 11:30	17-Jan-2018 10:00	☐
HS18010694-23	17SS98-0.0-2.0	Soil		14-Jan-2018 11:40	17-Jan-2018 10:00	☐
HS18010694-24	17SS97-0.0-2.0	Soil		14-Jan-2018 11:50	17-Jan-2018 10:00	☐
HS18010694-25	COE17-08A-0.0-2.0	Soil		14-Jan-2018 12:00	17-Jan-2018 10:00	☐
HS18010694-26	COE17-08A-2.5-4.5	Soil		14-Jan-2018 12:05	17-Jan-2018 10:00	☐
HS18010694-27	17SS62-0.0-2.0	Soil		14-Jan-2018 13:20	17-Jan-2018 10:00	☐

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010694

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18010694-28	18SS64-0.0-2.0	Soil		14-Jan-2018 13:30	17-Jan-2018 10:00	☐
HS18010694-29	17SS66-0.0-2.0	Soil		14-Jan-2018 13:40	17-Jan-2018 10:00	☐
HS18010694-30	17SS63-0.0-2.0	Soil		14-Jan-2018 13:50	17-Jan-2018 10:00	☐
HS18010694-31	17SS65-0.0-2.0	Soil		14-Jan-2018 14:00	17-Jan-2018 10:00	☐
HS18010694-32	17SS82-0.0-0.5	Soil		15-Jan-2018 09:55	17-Jan-2018 10:00	☐
HS18010694-33	17SS80-0.0-0.5	Soil		15-Jan-2018 10:00	17-Jan-2018 10:00	☐
HS18010694-34	17SS79-0.0-0.5	Soil		15-Jan-2018 10:05	17-Jan-2018 10:00	☐
HS18010694-35	17SS81-0.0-0.5	Soil		15-Jan-2018 10:10	17-Jan-2018 10:00	☐

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Work Order: HS18010694

CASE NARRATIVE**Work Order Comments**

- The analysis for Dioxins/Furans was subcontracted to our ALS Houston TX, High Resolution Lab. Final report attached.

HPLC by Method SW8330**Batch ID: 124569**

Sample ID: 17SS08-0.0-2.0 (HS18010694-14)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: 17SS107-0.0-2.0 (HS18010694-20)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: 18SS64-0.0-2.0 (HS18010694-28)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Batch ID: 124568

Sample ID: 17SS60-0.0-2.0 (HS18010694-05)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: 17SS61-0.0-2.0 (HS18010694-06)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: 17SS61-0.0-2.0-FD (HS18010694-07)

- The surrogate recoveries could not be determined due to dilution below the calibration range.

Metals by Method SW6020**Batch ID: 124446**

Sample ID: 17SS50-0.0-0.5 (HS18010694-17MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium

Sample ID: 17SS50-0.0-0.5 (HS18010694-17MSD)

- Due to non-homogeneity of the soil sample matrix the PDS RPD were outside the control limits for Barium.

WetChemistry by Method ASTM D2216**Batch ID: R309888,R309889**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS59-0.0-0.5
 Collection Date: 13-Jan-2018 11:38

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-01
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	94.2		6.03	30.4	73.0	ug/Kg-dry	1	28-Jan-2018 16:52
2,4-Dinitrotoluene	616		5.40	30.4	73.0	ug/Kg-dry	1	28-Jan-2018 16:52
2,6-Dinitrotoluene	52.0	J	13.1	30.4	73.0	ug/Kg-dry	1	28-Jan-2018 16:52
Surr: 1,2-Dinitrobenzene	75.3			0	50-150	%REC	1	28-Jan-2018 16:52
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.6		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS57-0.0-0.5
 Collection Date: 13-Jan-2018 11:40

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-02
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	30.0	U	5.95	30.0	71.9	ug/Kg-dry	1	28-Jan-2018 17:28
2,4-Dinitrotoluene	210		5.32	30.0	71.9	ug/Kg-dry	1	28-Jan-2018 17:28
2,6-Dinitrotoluene	77.6		12.9	30.0	71.9	ug/Kg-dry	1	28-Jan-2018 17:28
<i>Surr: 1,2-Dinitrobenzene</i>	<i>76.1</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 17:28</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	19.0		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS56-0.0-0.5
 Collection Date: 13-Jan-2018 11:48

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-03
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	32.2	U	6.40	32.2	77.4	ug/Kg-dry	1	28-Jan-2018 18:04
2,4-Dinitrotoluene	151		5.73	32.2	77.4	ug/Kg-dry	1	28-Jan-2018 18:04
2,6-Dinitrotoluene	32.2	U	13.9	32.2	77.4	ug/Kg-dry	1	28-Jan-2018 18:04
<i>Surr: 1,2-Dinitrobenzene</i>	<i>77.7</i>			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>28-Jan-2018 18:04</i>
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	25.1		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS58-0.0-0.5
 Collection Date: 13-Jan-2018 11:55

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-04
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	338		6.36	32.1	77.0	ug/Kg-dry	1	28-Jan-2018 18:40
2,4-Dinitrotoluene	457		5.70	32.1	77.0	ug/Kg-dry	1	28-Jan-2018 18:40
2,6-Dinitrotoluene	176		13.9	32.1	77.0	ug/Kg-dry	1	28-Jan-2018 18:40
Surr: 1,2-Dinitrobenzene	78.8			0	50-150	%REC	1	28-Jan-2018 18:40
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	23.6		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS60-0.0-2.0
 Collection Date: 13-Jan-2018 12:05

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-05
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	329,000		617	3110	7460	ug/Kg-dry	100	30-Jan-2018 00:14
2,4-Dinitrotoluene	1,430		5.52	31.1	74.6	ug/Kg-dry	1	28-Jan-2018 19:16
2,6-Dinitrotoluene	1,140		13.4	31.1	74.6	ug/Kg-dry	1	28-Jan-2018 19:16
Surr: 1,2-Dinitrobenzene	76.5			0	50-150	%REC	1	28-Jan-2018 19:16
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	100	30-Jan-2018 00:14
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.8		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS61-0.0-2.0
 Collection Date: 13-Jan-2018 12:15

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-06
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	291,000		635	3200	7680	ug/Kg-dry	100	30-Jan-2018 00:50
2,4-Dinitrotoluene	828		5.69	32.0	76.8	ug/Kg-dry	1	28-Jan-2018 21:03
2,6-Dinitrotoluene	422		13.8	32.0	76.8	ug/Kg-dry	1	28-Jan-2018 21:03
Surr: 1,2-Dinitrobenzene	77.2			0	50-150	%REC	1	28-Jan-2018 21:03
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	100	30-Jan-2018 00:50
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	21.9		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS61-0.0-2.0-FD
 Collection Date: 13-Jan-2018 12:15

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-07
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	116,000		307	1550	3720	ug/Kg-dry	50	30-Jan-2018 01:26
2,4-Dinitrotoluene	379		5.50	31.0	74.4	ug/Kg-dry	1	28-Jan-2018 21:39
2,6-Dinitrotoluene	43.9	J	13.4	31.0	74.4	ug/Kg-dry	1	28-Jan-2018 21:39
Surr: 1,2-Dinitrobenzene	78.4			0	50-150	%REC	1	28-Jan-2018 21:39
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	50	30-Jan-2018 01:26
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	22.8		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS55-0.0-0.5
 Collection Date: 13-Jan-2018 13:50

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-08
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	5,760		18.6	61.9	310	mg/Kg-dry	500	26-Jan-2018 20:59
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	26.2		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS53-0.0-0.5
 Collection Date: 13-Jan-2018 13:55

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-09
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	150		0.347	1.16	5.79	mg/Kg-dry	10	26-Jan-2018 21:01
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	19.6		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS54-0.0-0.5
 Collection Date: 13-Jan-2018 14:00

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-10
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	279		0.673	2.24	11.2	mg/Kg-dry	20	26-Jan-2018 21:03
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	17.7		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS52-0.0-0.5
 Collection Date: 13-Jan-2018 14:05

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-11
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	154		0.0372	0.124	0.621	mg/Kg-dry	1	26-Jan-2018 17:55
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	21.5		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS104-0.0-2.0
 Collection Date: 13-Jan-2018 16:00

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-12
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	630		5.98	30.2	72.4	ug/Kg-dry	1	29-Jan-2018 01:15
2,4-Dinitrotoluene	30.2	U	5.36	30.2	72.4	ug/Kg-dry	1	29-Jan-2018 01:15
2,6-Dinitrotoluene	30.2	U	13.0	30.2	72.4	ug/Kg-dry	1	29-Jan-2018 01:15
<i>Surr: 1,2-Dinitrobenzene</i>	76.9			0	<i>50-150</i>	<i>%REC</i>	<i>1</i>	<i>29-Jan-2018 01:15</i>
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.3		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS104-2.5-4.5
 Collection Date: 13-Jan-2018 16:05

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-13
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.7	U	5.90	29.7	71.4	ug/Kg-dry	1	29-Jan-2018 01:51
2,4-Dinitrotoluene	29.7	U	5.28	29.7	71.4	ug/Kg-dry	1	29-Jan-2018 01:51
2,6-Dinitrotoluene	29.7	U	12.9	29.7	71.4	ug/Kg-dry	1	29-Jan-2018 01:51
<i>Surr: 1,2-Dinitrobenzene</i>	75.9			0	50-150	%REC	1	29-Jan-2018 01:51
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.2		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS08-0.0-2.0
 Collection Date: 13-Jan-2018 16:15

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-14
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	9,970,000		28800	145000	349000	ug/Kg-dry	5000	30-Jan-2018 10:56
2,4-Dinitrotoluene	5,510		10.3	58.1	139	ug/Kg-dry	2	30-Jan-2018 02:01
2,6-Dinitrotoluene	7,930		25.1	58.1	139	ug/Kg-dry	2	30-Jan-2018 02:01
Surr: 1,2-Dinitrobenzene	78.1			0	50-150	%REC	2	30-Jan-2018 02:01
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	5000	30-Jan-2018 10:56
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.4		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS48-0.0-0.5
 Collection Date: 14-Jan-2018 10:20

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-15
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	132		0.0345	0.115	0.575	mg/Kg-dry	1	26-Jan-2018 17:57
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	16.9		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS49-0.0-0.5
 Collection Date: 14-Jan-2018 10:25

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-16
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	129		0.0352	0.117	0.587	mg/Kg-dry	1	26-Jan-2018 17:59
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	19.4		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
Sample ID: 17SS50-0.0-0.5
Collection Date: 14-Jan-2018 10:30

ANALYTICAL REPORT

WorkOrder:HS18010694
Lab ID:HS18010694-17
Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	511		3.57	11.9	59.5	mg/Kg-dry	100	26-Jan-2018 21:05
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	18.9		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS51-0.0-0.5
 Collection Date: 14-Jan-2018 10:35

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-18
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	125		0.0361	0.120	0.602	mg/Kg-dry	1	26-Jan-2018 18:21
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	20.7		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS106-0.0-2.0
 Collection Date: 14-Jan-2018 10:50

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-19
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	117		5.89	29.7	71.2	ug/Kg-dry	1	29-Jan-2018 04:14
2,4-Dinitrotoluene	82.2		5.27	29.7	71.2	ug/Kg-dry	1	29-Jan-2018 04:14
2,6-Dinitrotoluene	73.9		12.8	29.7	71.2	ug/Kg-dry	1	29-Jan-2018 04:14
Surr: 1,2-Dinitrobenzene	75.4			0	50-150	%REC	1	29-Jan-2018 04:14
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.8		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS107-0.0-2.0
 Collection Date: 14-Jan-2018 11:00

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-20
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	44,200		119	598	1430	ug/Kg-dry	20	30-Jan-2018 03:13
2,4-Dinitrotoluene	3,390		5.31	29.9	71.7	ug/Kg-dry	1	29-Jan-2018 04:50
2,6-Dinitrotoluene	11,200		258	598	1430	ug/Kg-dry	20	30-Jan-2018 03:13
Surr: 1,2-Dinitrobenzene	82.1			0	50-150	%REC	1	29-Jan-2018 04:50
Surr: 1,2-Dinitrobenzene	81.0	J		0	50-150	%REC	20	30-Jan-2018 03:13
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.0		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 11:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS96-0.0-2.0
 Collection Date: 14-Jan-2018 11:20

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-21
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	543		5.97	30.1	72.2	ug/Kg-dry	1	29-Jan-2018 05:26
2,4-Dinitrotoluene	246		5.34	30.1	72.2	ug/Kg-dry	1	29-Jan-2018 05:26
2,6-Dinitrotoluene	148		13.0	30.1	72.2	ug/Kg-dry	1	29-Jan-2018 05:26
Surr: 1,2-Dinitrobenzene	75.9			0	50-150	%REC	1	29-Jan-2018 05:26
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.3		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS95-0.0-2.0
 Collection Date: 14-Jan-2018 11:30

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-22
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	8,260		28.4	143	343	ug/Kg-dry	5	30-Jan-2018 04:25
2,4-Dinitrotoluene	408		5.08	28.6	68.7	ug/Kg-dry	1	29-Jan-2018 06:02
2,6-Dinitrotoluene	407		12.4	28.6	68.7	ug/Kg-dry	1	29-Jan-2018 06:02
Surr: 1,2-Dinitrobenzene	77.5			0	50-150	%REC	1	29-Jan-2018 06:02
Surr: 1,2-Dinitrobenzene	73.6			0	50-150	%REC	5	30-Jan-2018 04:25
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	15.6		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS98-0.0-2.0
 Collection Date: 14-Jan-2018 11:40

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-23
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.5	U	5.65	28.5	68.4	ug/Kg-dry	1	29-Jan-2018 06:38
2,4-Dinitrotoluene	28.5	U	5.06	28.5	68.4	ug/Kg-dry	1	29-Jan-2018 06:38
2,6-Dinitrotoluene	28.5	U	12.3	28.5	68.4	ug/Kg-dry	1	29-Jan-2018 06:38
<i>Surr: 1,2-Dinitrobenzene</i>	76.9			0	50-150	%REC	1	29-Jan-2018 06:38
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.0		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS97-0.0-2.0
 Collection Date: 14-Jan-2018 11:50

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-24
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.4	U	5.84	29.4	70.6	ug/Kg-dry	1	29-Jan-2018 07:14
2,4-Dinitrotoluene	29.4	U	5.23	29.4	70.6	ug/Kg-dry	1	29-Jan-2018 07:14
2,6-Dinitrotoluene	29.4	U	12.7	29.4	70.6	ug/Kg-dry	1	29-Jan-2018 07:14
<i>Surr: 1,2-Dinitrobenzene</i>	75.6			0	50-150	%REC	1	29-Jan-2018 07:14
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.3		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-08A-0.0-2.0
 Collection Date: 14-Jan-2018 12:00

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-25
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	28.4	U	5.62	28.4	68.0	ug/Kg-dry	1	28-Jan-2018 22:15
2,4-Dinitrotoluene	69.3		5.04	28.4	68.0	ug/Kg-dry	1	28-Jan-2018 22:15
2,6-Dinitrotoluene	28.4	U	12.2	28.4	68.0	ug/Kg-dry	1	28-Jan-2018 22:15
<i>Surr: 1,2-Dinitrobenzene</i>	75.8			0	50-150	%REC	1	28-Jan-2018 22:15
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	14.8		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: COE17-08A-2.5-4.5
 Collection Date: 14-Jan-2018 12:05

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-26
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	29.9	U	5.93	29.9	71.8	ug/Kg-dry	1	29-Jan-2018 07:50
2,4-Dinitrotoluene	29.9	U	5.31	29.9	71.8	ug/Kg-dry	1	29-Jan-2018 07:50
2,6-Dinitrotoluene	29.9	U	12.9	29.9	71.8	ug/Kg-dry	1	29-Jan-2018 07:50
<i>Surr: 1,2-Dinitrobenzene</i>	75.2			0	50-150	%REC	1	29-Jan-2018 07:50
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	16.4		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS62-0.0-2.0
 Collection Date: 14-Jan-2018 13:20

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-27
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	5,160		6.23	31.4	75.4	ug/Kg-dry	1	29-Jan-2018 09:37
2,4-Dinitrotoluene	743		5.58	31.4	75.4	ug/Kg-dry	1	29-Jan-2018 09:37
2,6-Dinitrotoluene	388		13.6	31.4	75.4	ug/Kg-dry	1	29-Jan-2018 09:37
Surr: 1,2-Dinitrobenzene	75.4			0	50-150	%REC	1	29-Jan-2018 09:37
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	20.8		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 18SS64-0.0-2.0
 Collection Date: 14-Jan-2018 13:30

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-28
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	109,000		303	1530	3660	ug/Kg-dry	50	30-Jan-2018 05:00
2,4-Dinitrotoluene	17,100		271	1530	3660	ug/Kg-dry	50	30-Jan-2018 05:00
2,6-Dinitrotoluene	2,050		13.2	30.5	73.3	ug/Kg-dry	1	29-Jan-2018 11:25
Surr: 1,2-Dinitrobenzene	79.3			0	50-150	%REC	1	29-Jan-2018 11:25
Surr: 1,2-Dinitrobenzene	0	S		0	50-150	%REC	50	30-Jan-2018 05:00
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	20.5		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS66-0.0-2.0
 Collection Date: 14-Jan-2018 13:40

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-29
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	572		5.92	29.8	71.6	ug/Kg-dry	1	29-Jan-2018 12:00
2,4-Dinitrotoluene	112		5.30	29.8	71.6	ug/Kg-dry	1	29-Jan-2018 12:00
2,6-Dinitrotoluene	29.8	U	12.9	29.8	71.6	ug/Kg-dry	1	29-Jan-2018 12:00
Surr: 1,2-Dinitrobenzene	73.4			0	50-150	%REC	1	29-Jan-2018 12:00
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	17.0		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS63-0.0-2.0
 Collection Date: 14-Jan-2018 13:50

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-30
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	236		6.34	32.0	76.7	ug/Kg-dry	1	29-Jan-2018 12:36
2,4-Dinitrotoluene	259		5.68	32.0	76.7	ug/Kg-dry	1	29-Jan-2018 12:36
2,6-Dinitrotoluene	181		13.8	32.0	76.7	ug/Kg-dry	1	29-Jan-2018 12:36
Surr: 1,2-Dinitrobenzene	74.4			0	50-150	%REC	1	29-Jan-2018 12:36
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	24.1		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS65-0.0-2.0
 Collection Date: 14-Jan-2018 14:00

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-31
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
EXPLOSIVES BY SW8330B		Method:SW8330				Prep:SW8330 / 23-Jan-2018		Analyst: NPI
2,4,6-Trinitrotoluene	129		6.08	30.6	73.5	ug/Kg-dry	1	29-Jan-2018 13:12
2,4-Dinitrotoluene	60.4	J	5.44	30.6	73.5	ug/Kg-dry	1	29-Jan-2018 13:12
2,6-Dinitrotoluene	30.6	U	13.2	30.6	73.5	ug/Kg-dry	1	29-Jan-2018 13:12
Surr: 1,2-Dinitrobenzene	75.3			0	50-150	%REC	1	29-Jan-2018 13:12
MOISTURE - ASTM D2216		Method:ASTM D2216				Analyst: DFF		
Percent Moisture	18.8		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS82-0.0-0.5
 Collection Date: 15-Jan-2018 09:55

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-32
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	95.3		0.0344	0.115	0.573	mg/Kg-dry	1	26-Jan-2018 18:23
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	18.1		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05
SUBCONTRACT ANALYSIS - DIOXINS/FURANS 8290A		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0			1	31-Jan-2018 12:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS80-0.0-0.5
 Collection Date: 15-Jan-2018 10:00

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-33
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	62.0		0.0360	0.120	0.599	mg/Kg-dry	1	26-Jan-2018 18:25
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	20.6		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05
SUBCONTRACT ANALYSIS - DIOXINS/FURANS 8290A		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0			1	31-Jan-2018 12:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS79-0.0-0.5
 Collection Date: 15-Jan-2018 10:05

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-34
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	54.5		0.0346	0.115	0.576	mg/Kg-dry	1	26-Jan-2018 18:27
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	19.2		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05
SUBCONTRACT ANALYSIS - DIOXINS/FURANS 8290A		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0			1	31-Jan-2018 12:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant
 Sample ID: 17SS81-0.0-0.5
 Collection Date: 15-Jan-2018 10:10

ANALYTICAL REPORT

WorkOrder:HS18010694
 Lab ID:HS18010694-35
 Matrix:Soil

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY SW6020A		Method:SW6020				Prep:SW3050A / 19-Jan-2018		Analyst: JCJ
Barium	184		0.0339	0.113	0.565	mg/Kg-dry	1	26-Jan-2018 18:29
MOISTURE - ASTM D2216		Method:ASTM D2216						Analyst: DFF
Percent Moisture	17.1		0.0100	0.0100	0.0100	wt%	1	30-Jan-2018 13:05
SUBCONTRACT ANALYSIS - DIOXINS/FURANS 8290A		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0			1	31-Jan-2018 12:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Aptim Environmental & Infrastructure, Inc.**Project:** Longhorn Army Ammunition Plant**WorkOrder:** HS18010694**Batch ID:** 124446 **Method:** METALS BY SW6020A **Prep:** 3050_I_LOW

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010694-08	1	0.5469	50 (mL)	91.42
HS18010694-09	1	0.5375	50 (mL)	93.02
HS18010694-10	1	0.5416	50 (mL)	92.32
HS18010694-11	1	0.513	50 (mL)	97.47
HS18010694-15	1	0.523	50 (mL)	95.6
HS18010694-16	1	0.5288	50 (mL)	94.55
HS18010694-17	1	0.5179	50 (mL)	96.54
HS18010694-18	1	0.5238	50 (mL)	95.46
HS18010694-32	1	0.5323	50 (mL)	93.93
HS18010694-33	1	0.5253	50 (mL)	95.18
HS18010694-34	1	0.5371	50 (mL)	93.09
HS18010694-35	1	0.5335	50 (mL)	93.72

Batch ID: 124568 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010694-01	1	2.02	10 (mL)	4.95
HS18010694-02	1	2.06	10 (mL)	4.854
HS18010694-03	1	2.07	10 (mL)	4.831
HS18010694-04	1	2.04	10 (mL)	4.902
HS18010694-05	1	2.03	10 (mL)	4.926
HS18010694-06	1	2	10 (mL)	5
HS18010694-07	1	2.09	10 (mL)	4.785
HS18010694-25	1	2.07	10 (mL)	4.831

Batch ID: 124569 **Method:** EXPLOSIVES BY SW8330B **Prep:** 8330_SPR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS18010694-12	1	2.08	10 (mL)	4.808
HS18010694-13	1	2.03	10 (mL)	4.926
HS18010694-14	1	2.01	10 (mL)	4.975
HS18010694-19	1	2.05	10 (mL)	4.878
HS18010694-20	1	2.04	10 (mL)	4.902
HS18010694-21	1	2.01	10 (mL)	4.975
HS18010694-22	1	2.07	10 (mL)	4.831
HS18010694-23	1	2.09	10 (mL)	4.785
HS18010694-24	1	2.03	10 (mL)	4.926
HS18010694-26	1	2	10 (mL)	5
HS18010694-27	1	2.01	10 (mL)	4.975
HS18010694-28	1	2.06	10 (mL)	4.854
HS18010694-29	1	2.02	10 (mL)	4.95
HS18010694-30	1	2.06	10 (mL)	4.854
HS18010694-31	1	2.01	10 (mL)	4.975

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124446	Test Name : METALS BY SW6020A			Matrix: Soil		
HS18010694-08	17SS55-0.0-0.5	13 Jan 2018 13:50		19 Jan 2018 07:41	26 Jan 2018 20:59	500
HS18010694-09	17SS53-0.0-0.5	13 Jan 2018 13:55		19 Jan 2018 07:41	26 Jan 2018 21:01	10
HS18010694-10	17SS54-0.0-0.5	13 Jan 2018 14:00		19 Jan 2018 07:41	26 Jan 2018 21:03	20
HS18010694-11	17SS52-0.0-0.5	13 Jan 2018 14:05		19 Jan 2018 07:41	26 Jan 2018 17:55	1
HS18010694-15	17SS48-0.0-0.5	14 Jan 2018 10:20		19 Jan 2018 07:41	26 Jan 2018 17:57	1
HS18010694-16	17SS49-0.0-0.5	14 Jan 2018 10:25		19 Jan 2018 07:41	26 Jan 2018 17:59	1
HS18010694-17	17SS50-0.0-0.5	14 Jan 2018 10:30		19 Jan 2018 07:41	26 Jan 2018 21:05	100
HS18010694-18	17SS51-0.0-0.5	14 Jan 2018 10:35		19 Jan 2018 07:41	26 Jan 2018 18:21	1
HS18010694-32	17SS82-0.0-0.5	15 Jan 2018 09:55		19 Jan 2018 07:41	26 Jan 2018 18:23	1
HS18010694-33	17SS80-0.0-0.5	15 Jan 2018 10:00		19 Jan 2018 07:41	26 Jan 2018 18:25	1
HS18010694-34	17SS79-0.0-0.5	15 Jan 2018 10:05		19 Jan 2018 07:41	26 Jan 2018 18:27	1
HS18010694-35	17SS81-0.0-0.5	15 Jan 2018 10:10		19 Jan 2018 07:41	26 Jan 2018 18:29	1
Batch ID 124568	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010694-01	17SS59-0.0-0.5	13 Jan 2018 11:38		23 Jan 2018 18:16	28 Jan 2018 16:52	1
HS18010694-02	17SS57-0.0-0.5	13 Jan 2018 11:40		23 Jan 2018 18:16	28 Jan 2018 17:28	1
HS18010694-03	17SS56-0.0-0.5	13 Jan 2018 11:48		23 Jan 2018 18:16	28 Jan 2018 18:04	1
HS18010694-04	17SS58-0.0-0.5	13 Jan 2018 11:55		23 Jan 2018 18:16	28 Jan 2018 18:40	1
HS18010694-05	17SS60-0.0-2.0	13 Jan 2018 12:05		23 Jan 2018 18:16	30 Jan 2018 00:14	100
HS18010694-05	17SS60-0.0-2.0	13 Jan 2018 12:05		23 Jan 2018 18:16	28 Jan 2018 19:16	1
HS18010694-06	17SS61-0.0-2.0	13 Jan 2018 12:15		23 Jan 2018 18:16	30 Jan 2018 00:50	100
HS18010694-06	17SS61-0.0-2.0	13 Jan 2018 12:15		23 Jan 2018 18:16	28 Jan 2018 21:03	1
HS18010694-07	17SS61-0.0-2.0-FD	13 Jan 2018 12:15		23 Jan 2018 18:16	30 Jan 2018 01:26	50
HS18010694-07	17SS61-0.0-2.0-FD	13 Jan 2018 12:15		23 Jan 2018 18:16	28 Jan 2018 21:39	1
HS18010694-25	COE17-08A-0.0-2.0	14 Jan 2018 12:00		23 Jan 2018 18:16	28 Jan 2018 22:15	1

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 124569	Test Name : EXPLOSIVES BY SW8330B			Matrix: Soil		
HS18010694-12	17SS104-0.0-2.0	13 Jan 2018 16:00		23 Jan 2018 18:16	29 Jan 2018 01:15	1
HS18010694-13	17SS104-2.5-4.5	13 Jan 2018 16:05		23 Jan 2018 18:16	29 Jan 2018 01:51	1
HS18010694-14	17SS08-0.0-2.0	13 Jan 2018 16:15		23 Jan 2018 18:16	30 Jan 2018 10:56	5000
HS18010694-14	17SS08-0.0-2.0	13 Jan 2018 16:15		23 Jan 2018 18:16	30 Jan 2018 02:01	2
HS18010694-19	17SS106-0.0-2.0	14 Jan 2018 10:50		23 Jan 2018 18:16	29 Jan 2018 04:14	1
HS18010694-20	17SS107-0.0-2.0	14 Jan 2018 11:00		23 Jan 2018 18:16	30 Jan 2018 03:13	20
HS18010694-20	17SS107-0.0-2.0	14 Jan 2018 11:00		23 Jan 2018 18:16	29 Jan 2018 04:50	1
HS18010694-21	17SS96-0.0-2.0	14 Jan 2018 11:20		23 Jan 2018 18:16	29 Jan 2018 05:26	1
HS18010694-22	17SS95-0.0-2.0	14 Jan 2018 11:30		23 Jan 2018 18:16	30 Jan 2018 04:25	5
HS18010694-22	17SS95-0.0-2.0	14 Jan 2018 11:30		23 Jan 2018 18:16	29 Jan 2018 06:02	1
HS18010694-23	17SS98-0.0-2.0	14 Jan 2018 11:40		23 Jan 2018 18:16	29 Jan 2018 06:38	1
HS18010694-24	17SS97-0.0-2.0	14 Jan 2018 11:50		23 Jan 2018 18:16	29 Jan 2018 07:14	1
HS18010694-26	COE17-08A-2.5-4.5	14 Jan 2018 12:05		23 Jan 2018 18:16	29 Jan 2018 07:50	1
HS18010694-27	17SS62-0.0-2.0	14 Jan 2018 13:20		23 Jan 2018 18:16	29 Jan 2018 09:37	1
HS18010694-28	18SS64-0.0-2.0	14 Jan 2018 13:30		23 Jan 2018 18:16	30 Jan 2018 05:00	50
HS18010694-28	18SS64-0.0-2.0	14 Jan 2018 13:30		23 Jan 2018 18:16	29 Jan 2018 11:25	1
HS18010694-29	17SS66-0.0-2.0	14 Jan 2018 13:40		23 Jan 2018 18:16	29 Jan 2018 12:00	1
HS18010694-30	17SS63-0.0-2.0	14 Jan 2018 13:50		23 Jan 2018 18:16	29 Jan 2018 12:36	1
HS18010694-31	17SS65-0.0-2.0	14 Jan 2018 14:00		23 Jan 2018 18:16	29 Jan 2018 13:12	1
Batch ID R309888	Test Name : MOISTURE - ASTM D2216			Matrix: Soil		
HS18010694-01	17SS59-0.0-0.5	13 Jan 2018 11:38			30 Jan 2018 11:40	1
HS18010694-02	17SS57-0.0-0.5	13 Jan 2018 11:40			30 Jan 2018 11:40	1
HS18010694-03	17SS56-0.0-0.5	13 Jan 2018 11:48			30 Jan 2018 11:40	1
HS18010694-04	17SS58-0.0-0.5	13 Jan 2018 11:55			30 Jan 2018 11:40	1
HS18010694-05	17SS60-0.0-2.0	13 Jan 2018 12:05			30 Jan 2018 11:40	1
HS18010694-06	17SS61-0.0-2.0	13 Jan 2018 12:15			30 Jan 2018 11:40	1
HS18010694-07	17SS61-0.0-2.0-FD	13 Jan 2018 12:15			30 Jan 2018 11:40	1
HS18010694-08	17SS55-0.0-0.5	13 Jan 2018 13:50			30 Jan 2018 11:40	1
HS18010694-09	17SS53-0.0-0.5	13 Jan 2018 13:55			30 Jan 2018 11:40	1
HS18010694-10	17SS54-0.0-0.5	13 Jan 2018 14:00			30 Jan 2018 11:40	1
HS18010694-11	17SS52-0.0-0.5	13 Jan 2018 14:05			30 Jan 2018 11:40	1
HS18010694-12	17SS104-0.0-2.0	13 Jan 2018 16:00			30 Jan 2018 11:40	1
HS18010694-13	17SS104-2.5-4.5	13 Jan 2018 16:05			30 Jan 2018 11:40	1
HS18010694-14	17SS08-0.0-2.0	13 Jan 2018 16:15			30 Jan 2018 11:40	1
HS18010694-15	17SS48-0.0-0.5	14 Jan 2018 10:20			30 Jan 2018 11:40	1
HS18010694-16	17SS49-0.0-0.5	14 Jan 2018 10:25			30 Jan 2018 11:40	1
HS18010694-17	17SS50-0.0-0.5	14 Jan 2018 10:30			30 Jan 2018 11:40	1
HS18010694-18	17SS51-0.0-0.5	14 Jan 2018 10:35			30 Jan 2018 11:40	1
HS18010694-19	17SS106-0.0-2.0	14 Jan 2018 10:50			30 Jan 2018 11:40	1
HS18010694-20	17SS107-0.0-2.0	14 Jan 2018 11:00			30 Jan 2018 11:40	1

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID	R309889	Test Name : MOISTURE - ASTM D2216			Matrix: Soil	
HS18010694-21	17SS96-0.0-2.0	14 Jan 2018 11:20			30 Jan 2018 13:05	1
HS18010694-22	17SS95-0.0-2.0	14 Jan 2018 11:30			30 Jan 2018 13:05	1
HS18010694-23	17SS98-0.0-2.0	14 Jan 2018 11:40			30 Jan 2018 13:05	1
HS18010694-24	17SS97-0.0-2.0	14 Jan 2018 11:50			30 Jan 2018 13:05	1
HS18010694-25	COE17-08A-0.0-2.0	14 Jan 2018 12:00			30 Jan 2018 13:05	1
HS18010694-26	COE17-08A-2.5-4.5	14 Jan 2018 12:05			30 Jan 2018 13:05	1
HS18010694-27	17SS62-0.0-2.0	14 Jan 2018 13:20			30 Jan 2018 13:05	1
HS18010694-28	18SS64-0.0-2.0	14 Jan 2018 13:30			30 Jan 2018 13:05	1
HS18010694-29	17SS66-0.0-2.0	14 Jan 2018 13:40			30 Jan 2018 13:05	1
HS18010694-30	17SS63-0.0-2.0	14 Jan 2018 13:50			30 Jan 2018 13:05	1
HS18010694-31	17SS65-0.0-2.0	14 Jan 2018 14:00			30 Jan 2018 13:05	1
HS18010694-32	17SS82-0.0-0.5	15 Jan 2018 09:55			30 Jan 2018 13:05	1
HS18010694-33	17SS80-0.0-0.5	15 Jan 2018 10:00			30 Jan 2018 13:05	1
HS18010694-34	17SS79-0.0-0.5	15 Jan 2018 10:05			30 Jan 2018 13:05	1
HS18010694-35	17SS81-0.0-0.5	15 Jan 2018 10:10			30 Jan 2018 13:05	1
Batch ID	R309907	Test Name : SUBCONTRACT ANALYSIS - DIOXINS/FURANS 8290A			Matrix: Soil	
HS18010694-32	17SS82-0.0-0.5	15 Jan 2018 09:55			31 Jan 2018 12:02	1
HS18010694-33	17SS80-0.0-0.5	15 Jan 2018 10:00			31 Jan 2018 12:02	1
HS18010694-34	17SS79-0.0-0.5	15 Jan 2018 10:05			31 Jan 2018 12:02	1
HS18010694-35	17SS81-0.0-0.5	15 Jan 2018 10:10			31 Jan 2018 12:02	1

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

QC BATCH REPORT

Batch ID: 124568		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124568	Units: ug/Kg		Analysis Date: 28-Jan-2018 04:52					
Client ID:	Run ID: HPLC3_309714	SeqNo: 4408807		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>921.1</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.7</i>	<i>50 - 150</i>			
LCS	Sample ID: LCS-124568	Units: ug/Kg		Analysis Date: 28-Jan-2018 05:28					
Client ID:	Run ID: HPLC3_309714	SeqNo: 4408808		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1037	60.0	1250	0	83.0	75 - 125			
2,4-Dinitrotoluene	1207	60.0	1250	0	96.5	82 - 123			
2,6-Dinitrotoluene	1170	60.0	1250	0	93.6	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>935.5</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>74.8</i>	<i>50 - 150</i>			
MS	Sample ID: HS18010694-25MS	Units: ug/Kg		Analysis Date: 28-Jan-2018 22:51					
Client ID: COE17-08A-0.0-2.0	Run ID: HPLC3_309714	SeqNo: 4418714		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1104	59.7	1244	0	88.8	75 - 125			
2,4-Dinitrotoluene	1319	59.7	1244	59.07	101	82 - 123			
2,6-Dinitrotoluene	1247	59.7	1244	0	100	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>961.3</i>	<i>59.7</i>	<i>1244</i>	<i>0</i>	<i>77.3</i>	<i>50 - 150</i>			
MSD	Sample ID: HS18010694-25MSD	Units: ug/Kg		Analysis Date: 28-Jan-2018 23:27					
Client ID: COE17-08A-0.0-2.0	Run ID: HPLC3_309714	SeqNo: 4418715		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1081	59.1	1232	0	87.8	75 - 125	1104	2.08	30
2,4-Dinitrotoluene	1310	59.1	1232	59.07	102	82 - 123	1319	0.661	30
2,6-Dinitrotoluene	1241	59.1	1232	0	101	86 - 119	1247	0.504	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>955.7</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>77.6</i>	<i>50 - 150</i>	<i>961.3</i>	<i>0.588</i>	<i>30</i>
The following samples were analyzed in this batch:									
HS18010694-01		HS18010694-02		HS18010694-03		HS18010694-04			
HS18010694-05		HS18010694-06		HS18010694-07		HS18010694-25			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

QC BATCH REPORT

Batch ID: 124569		Instrument: HPLC3		Method: SW8330					
MBLK	Sample ID: MBLK-124569	Units: ug/Kg		Analysis Date: 29-Jan-2018 00:03					
Client ID:	Run ID: HPLC3_309722	SeqNo: 4409058		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	25.0	60.0							U
2,4-Dinitrotoluene	25.0	60.0							U
2,6-Dinitrotoluene	25.0	60.0							U
<i>Surr: 1,2-Dinitrobenzene</i>	<i>919.4</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>73.6</i>	<i>50 - 150</i>			
LCS	Sample ID: LCS-124569	Units: ug/Kg		Analysis Date: 29-Jan-2018 00:39					
Client ID:	Run ID: HPLC3_309722	SeqNo: 4409059		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1058	60.0	1250	0	84.6	75 - 125			
2,4-Dinitrotoluene	1208	60.0	1250	0	96.7	82 - 123			
2,6-Dinitrotoluene	1179	60.0	1250	0	94.3	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>933.9</i>	<i>60.0</i>	<i>1250</i>	<i>0</i>	<i>74.7</i>	<i>50 - 150</i>			
MS	Sample ID: HS18010694-26MS	Units: ug/Kg		Analysis Date: 29-Jan-2018 08:25					
Client ID: COE17-08A-2.5-4.5	Run ID: HPLC3_309722	SeqNo: 4409065		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1067	59.1	1232	0	86.6	75 - 125			
2,4-Dinitrotoluene	1216	59.1	1232	0	98.7	82 - 123			
2,6-Dinitrotoluene	1157	59.1	1232	0	93.9	86 - 119			
<i>Surr: 1,2-Dinitrobenzene</i>	<i>937.1</i>	<i>59.1</i>	<i>1232</i>	<i>0</i>	<i>76.1</i>	<i>50 - 150</i>			
MSD	Sample ID: HS18010694-26MSD	Units: ug/Kg		Analysis Date: 29-Jan-2018 09:01					
Client ID: COE17-08A-2.5-4.5	Run ID: HPLC3_309722	SeqNo: 4409066		PrepDate: 23-Jan-2018		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
2,4,6-Trinitrotoluene	1055	58.5	1220	0	86.5	75 - 125	1067	1.1	30
2,4-Dinitrotoluene	1195	58.5	1220	0	98.0	82 - 123	1216	1.74	30
2,6-Dinitrotoluene	1168	58.5	1220	0	95.8	86 - 119	1157	0.977	30
<i>Surr: 1,2-Dinitrobenzene</i>	<i>925.2</i>	<i>58.5</i>	<i>1220</i>	<i>0</i>	<i>75.9</i>	<i>50 - 150</i>	<i>937.1</i>	<i>1.27</i>	<i>30</i>
The following samples were analyzed in this batch:									
HS18010694-12		HS18010694-13		HS18010694-14		HS18010694-19			
HS18010694-20		HS18010694-21		HS18010694-22		HS18010694-23			
HS18010694-24		HS18010694-26		HS18010694-27		HS18010694-28			
HS18010694-29		HS18010694-30		HS18010694-31					

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

QC BATCH REPORT

Batch ID: 124446		Instrument: ICPMS04		Method: SW6020						
MBLK	Sample ID: MBLK-124446	Units: mg/Kg		Analysis Date: 26-Jan-2018 17:44						
Client ID:	Run ID: ICPMS04_309635	SeqNo: 4407666		PrepDate: 19-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	0.100	0.500							U	
LCS	Sample ID: LCS-124446	Units: mg/Kg		Analysis Date: 26-Jan-2018 17:46						
Client ID:	Run ID: ICPMS04_309635	SeqNo: 4407667		PrepDate: 19-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	9.602	0.500	10	0	96.0	80 - 120				
MS	Sample ID: HS18010694-17MS	Units: mg/Kg		Analysis Date: 26-Jan-2018 18:14						
Client ID: 17SS50-0.0-0.5	Run ID: ICPMS04_309635	SeqNo: 4407678		PrepDate: 19-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	430.4	0.460	9.21	411	211	75 - 125			SEO	
MSD	Sample ID: HS18010694-17MSD	Units: mg/Kg		Analysis Date: 26-Jan-2018 18:16						
Client ID: 17SS50-0.0-0.5	Run ID: ICPMS04_309635	SeqNo: 4407679		PrepDate: 19-Jan-2018		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	348.3	0.465	9.297	411	-674	75 - 125	430.4	21.1	20 SREO	
PDS	Sample ID: HS18010694-17PDS	Units: mg/Kg		Analysis Date: 26-Jan-2018 21:10						
Client ID: 17SS50-0.0-0.5	Run ID: ICPMS04_309635	SeqNo: 4407783		PrepDate: 19-Jan-2018		DF: 100				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Barium	1232	48.3	965.4	414.3	84.7	75 - 125				
SD	Sample ID: HS18010694-17SD	Units: mg/Kg		Analysis Date: 26-Jan-2018 21:07						
Client ID: 17SS50-0.0-0.5	Run ID: ICPMS04_309635	SeqNo: 4407782		PrepDate: 19-Jan-2018		DF: 500				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit Qual	
Barium	377	241					414.3	9.01	10	
The following samples were analyzed in this batch:										
HS18010694-08		HS18010694-09		HS18010694-10		HS18010694-11				
HS18010694-15		HS18010694-16		HS18010694-17		HS18010694-18				
HS18010694-32		HS18010694-33		HS18010694-34		HS18010694-35				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.

Project: Longhorn Army Ammunition Plant

WorkOrder: HS18010694

QC BATCH REPORT

Batch ID: R309888		Instrument: Balance1		Method: ASTM D2216	
DUP	Sample ID: HS18010694-20DUP	Units: wt%		Analysis Date: 30-Jan-2018 11:40	
Client ID: 17SS107-0.0-2.0	Run ID: Balance1_309888		SeqNo: 4413569	PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
Percent Moisture	17.9	0.0100			18 0.557 20

The following samples were analyzed in this batch:

HS18010694-01	HS18010694-02	HS18010694-03	HS18010694-04
HS18010694-05	HS18010694-06	HS18010694-07	HS18010694-08
HS18010694-09	HS18010694-10	HS18010694-11	HS18010694-12
HS18010694-13	HS18010694-14	HS18010694-15	HS18010694-16
HS18010694-17	HS18010694-18	HS18010694-19	HS18010694-20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

QC BATCH REPORT

Batch ID: R309889		Instrument: Balance1		Method: ASTM D2216					
DUP	Sample ID: HS18010694-26DUP	Units: wt%		Analysis Date: 30-Jan-2018 13:05					
Client ID: COE17-08A-2.5-4.5	Run ID: Balance1_309889		SeqNo: 4413586		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Percent Moisture	15.6	0.0100					16.4	5	20
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DUP	Sample ID: HS18010694-25DUP	Units: wt%		Analysis Date: 30-Jan-2018 13:05					
Client ID: COE17-08A-0.0-2.0	Run ID: Balance1_309889		SeqNo: 4413585		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual

Percent Moisture	13.8	0.0100					14.8	6.99	20
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The following samples were analyzed in this batch:

HS18010694-21	HS18010694-22	HS18010694-23	HS18010694-24
HS18010694-25	HS18010694-26	HS18010694-27	HS18010694-28
HS18010694-29	HS18010694-30	HS18010694-31	HS18010694-32
HS18010694-33	HS18010694-34	HS18010694-35	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group USA, Corp

Date: 05-Feb-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant
WorkOrder: HS18010694

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	17-027-0	27-Mar-2018
California	2919 2016-2018	31-Jul-2018
Illinois	004112	09-May-2018
Kentucky	123043	30-Apr-2018
Louisiana	03087 2017-2017	30-Jun-2018
North Dakota	R193 2017-2017	30-Apr-2018
Oklahoma	2017-088	31-Aug-2018
Texas	T104704231-17-19	30-Apr-2018
North Carolina	624-2018	31-Dec-2018

ALS Group USA, Corp

Date: 05-Feb-18

Sample Receipt Checklist

Client Name: CBI-Houston
Work Order: HS18010694

Date/Time Received: **17-Jan-2018 10:00**
Received by: **RPG**

Checklist completed by: Paresh M. Giga 18-Jan-2018
eSignature Date

Reviewed by: RJ Modashia 19-Jan-2018
eSignature Date

Matrices: **Soil**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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☒	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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): 0.8c/0.3c; 0.7c/0.2c U/C IR11

Cooler(s)/Kit(s): 43291; 25126

Date/Time sample(s) sent to storage: 1/18/18 18:10

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: ID differs : COC - 17SS08-0.0-2.0 Label - 17SS108-0.0-2.0 ; COC - 18SS64-0.0-2.0 Label - 17SS64-0.0-2.0. Times differ for 17SS104-2.5-4.5. COC - 16:05 Label - 16:08. 17SS52-0.0-0.5 COC - 13:50 Label - 14:05. Logged in per chains

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

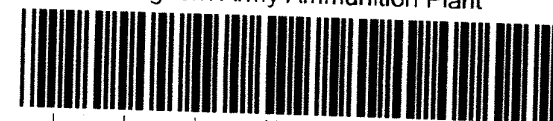
Corrective Action:



COC ID:		17-JAN2018-SO-ALSHT-011518				TURNAROUND TIME: normal				RUSH:													
PROJECT/CLIENT INFO						LABORATORY				OTHER INFO													
Facility Name	Longhorn AAP					Lab Name	ALS Laboratories			Email Invoice To	FedInvoices@CBIFederalServices.com												
Project Number	501032					Lab Contact	Sonia West																
	LHAAP-17					Email	Sonia.West@alsglobal.com			Email Report To	Sharon.Pennington@CBIFederalServices.com												
Address	1203-B East Grand Avenue					Address	10450 Stancil Rd., Suite 210			Mail Reports To	Sharon Pennington												
	PMB 202									Address	2410 Cherahala Blvd.												
City	Marshall	State	TX			City	Houston	State	TX	City	Knoxville	State	TN										
Postal Code	75670	Country	USA			Postal Code	77099	Country	USA	Postal Code	37932	Country	USA										
Phone Number	713.243.7264					Phone Number	281.575.2132 or 281.530.5656																
Project Manager	Praveen Srivastav									Shipping Company	FedEx												
SAMPLE DETAILS						ANALYSIS REQUESTED																	
Sample ID	Location	Start Depth	End Depth	Depth Unit	Field Matrix	Date	Time (24hr)	# Of Cont.	ANALYSIS	2,4-DNT, 2,6-DNT & 2,4,6-TNT in Soil by Method 8330	Barium in Soil by Method 6020A												
17SS59-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1138	1	X														
17SS57-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1140	1	X														
17SS56-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1148	1	X														
17SS58-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1155	1	X														
17SS60-0.0-2.0	LHAAP-17	0	2	FT	SO	1/13/2018	1205	1	X														
17SS61-0.0-2.0	LHAAP-17	0	2	FT	SO	1/13/2018	1215	1	X														
17SS61-0.0-2.0-FD	LHAAP-17	0	2	FT	SO	1/13/2018	1215	1	X														
17SS55-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1350	1		X													
17SS53-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1355	1		X													
17SS54-0.0-.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1400	1		X													
17SS52-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/13/2018	1405	1		X													
17SS104-0.0-2.0	LHAAP-17	0	2	FT	SO	1/13/2018	1600	1	X														
17SS104-2.5-4.5	LHAAP-17	2.5	4.5	FT	SO	1/13/2018	1605	1	X														
17SS08-0.0-2.0	LHAAP-17	0	2	FT	SO	1/13/2018	1615	1	X														
17SS48-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/14/2018	1020	1		X													
17SS49-0.0-0.5	LHAAP-17	0	0.5	FT	SO	1/14/2018	1025	1		X													
ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS						RELINQUISHED BY/AFFILIATION		DATE/TIME		ACCEPTED BY/AFFILIATION		DATE/TIME											
						DAVID Rowan APTIM		1/15/18		RG ALS		1-17-18 10:00											
								1/3/0															

HS18010694

Aptim Environmental & Infrastructure, Inc.
Longhorn Army Ammunition Plant



43291 0.8C 1R11 CF-0.5



COC ID: 17-JAN2018-SO-ALSHT-011518		TURNAROUND TIME: normal		RUSH:																																																																																																																																																																																																																																																																																																																																																																								
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HS18010694
 Aptim Environmental & Infrastructure, Inc.
 Longhorn Army Ammunition Plant



[illegible]

CUSTODY SEAL *SM*
DATE: 1/15/18 *01/17/18*
Signature: *[Signature]*
43291 **LHAAP**

43291 JAN 17 2018

FedEx
TRK# 7376 9751 5892
0221
TUE - 16 JAN 10:30A
PRIORITY OVERNIGHT

AB SGRA *43291*

77099
TX-US IAH



CUSTODY SEAL *SM*
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Signature: *[Signature]*
25126 **LHAAP**

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77099
TX-US IAH





January 31, 2018

Service Request No:E1800052

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

Laboratory Results for: HS18010694 Dioxins Furans Analysis

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 19, 2018
For your reference, these analyses have been assigned our service request number **E1800052**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current TNI standards, where applicable, and except as noted in the laboratory case narrative provided. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the final complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the TNI 2009 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please contact me if you have any questions. My extension is 2284. You may also contact me via email at Nicole.Brown@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Nicole Brown
Project Manager

ADDRESS 10450 Stancliff Rd., Suite 210, Houston, TX 77099
PHONE +1 713 266 1599 | FAX +1 713 266 0130
ALS Group USA, Corp.
dba ALS Environmental



Certificate of Analysis

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

ALS Environmental

Client: ALS Group USA, Corp. – Houston, TX
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request No.: E1800052
Date Received: 01/19/18

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Four soil samples were received for analysis at ALS Environmental in Houston on 01/19/18.

The samples were received at 7.9 °C in good condition and are consistent with the accompanying chain of custody form. Dioxin/furan compounds are stable at room temperature. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion**B flags – Method Blanks**

The Method Blank EQ1800038-01 contained low levels of 1234678-HpCDD and OCDD below the Method Reporting Limit (MRL). The associated compounds in the samples are flagged with 'B' flags where the sample result is less than ten times the level detected in the method blank. If the method blank result is less than ½ the LOQ then the corresponding sample result will not be qualified with a B flag per DOD guidelines.

MS/MSD

EQ1800038: Laboratory Control Spike/Duplicate Laboratory Control Spike (LCS/DLCS) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch. The matrix spike recovery for 2378-TCDD is slightly above control limits in the LCS DLCS. The relative percent difference is well within control limits.

2378-TCDF

Samples analyzed on the DB-5MSUI column were analyzed under conditions where sufficient separation between 2,3,7,8-TCDF and its closest eluter was achieved. Confirmation of this result was not required.

E flags

When OCDD and/or OCDF exceed the upper method calibration limit (MCL), Method 8290 Section 7.9.3 advises the chemist to "report the measured concentration and indicate that the value exceeds the MCL." We use 'E' flag on the Sample Analytical Report results page results to indicate a compound has exceeded the MCL.

K flags

EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.

Detection Limits

Detection limits are calculated for each analyte in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

The MRL = DoD LOQ, but the EDL is not directly correlated to LOD. The LOD is instrument and prep-method specific. ND compounds are reported to the LOD.

Manual Integrations

For this type of instrumentation and software, manual integration may be required frequently to correct inaccurate integrations performed by the processing software. These manual integrations are indicated in the raw data with a before and after chromatogram and are stamped with the reason for integration.

The TEQ Summary results for each sample have been calculated by ALS/Houston to include:

- WHO-2005 TEFs, The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds (M. Van den Berg et al., Toxicological Sciences 93(2):223-241, 2006)
- Non-detected compounds are not included in the 'Total'

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS group USA Corp dba ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis

Service Request:E1800052

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
E1800052-001	17SS82-0.0-0.5	1/15/2018	0955
E1800052-002	17SS80-0.0-0.5	1/15/2018	1000
E1800052-003	17SS79-0.0-0.5	1/15/2018	1005
E1800052-004	17SS81-0.0-0.5	1/15/2018	1010

Service Request Summary

Folder #: E1800052
Client Name: ALS Environmental - US
Project Name: HS18010694 Dioxins Furans Analysis
Project Number:

Report To: RJ Modashia
 ALS Laboratory Group
 10450 Stancliff Road
 Houston, TX 77099-4338
 USA

Phone Number: 281-530-5656

Cell Number:

Fax Number: 281-530-5887

E-mail: rj.modashia@alsglobal.com

Project Chemist: Nicole Brown
Originating Lab: HOUSTON
Logged By: JGHOSH
Date Received: 01/19/18
Internal Due Date: 1/31/2018
QAP: LAB QAP
Qualifier Set: HRMS Qualifier Set
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS18010694
EDD: No EDD Specified

8 4 oz-Glass Jar WM CLEAR Teflon Liner Unpreserved

Location: SMO, EHRMS-WIC 4C

Pressure Gas:

				HOUSTON	
Lab Samp No.	Client Samp No	Matrix	Collected	PCDD PCDF/8290	Total Solids/ALS SOP
E1800052-001	17SS82-0.0-0.5	Soil	01/15/18 0955	IV	IV
E1800052-002	17SS80-0.0-0.5	Soil	01/15/18 1000	IV	IV
E1800052-003	17SS79-0.0-0.5	Soil	01/15/18 1005	IV	IV
E1800052-004	17SS81-0.0-0.5	Soil	01/15/18 1010	IV	IV

Folder Comments:

DOD, Level 4

Service Request Summary

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Project Number:

Report To: RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Houston, TX 77099-4338
USA
Phone Number: 281-530-5656
Cell Number:
Fax Number: 281-530-5887
E-mail: rj.modashia@alsglobal.com

Project Chemist: Nicole Brown
Originating Lab: HOUSTON
Logged By: JGHOSH
Date Received: 01/19/18
Internal Due Date: 1/31/2018
QAP: LAB QAP
Qualifier Set: HRMS Qualifier Set
Formset: Lab Standard
Merged?: Y
Report to MDL?: Y
P.O. Number: HS18010694
EDD: No EDD Specified

8 4 oz-Glass Jar WM CLEAR Teflon Liner Unpreserved

Location: SMO, EHRMS-WIC 4C

Pressure Gas:

Superset Summary

Service Request: E1800052

SuperSet Reference: 18-0000452605 rev 00

Analytical Method: 8290

Calibrations: 01/26/18

Data Files:

Raw Data	Begin CCAL	Method Blank	Lab ID
P611259	P611252	P611256	E1800052-001
P611260	P611252	P611256	E1800052-002
P611261	P611252	P611256	E1800052-003
P611262	P611252	P611256	E1800052-004
P611256	P611252	P611256	EQ1800038-01
P611264	P611252	P611256	EQ1800038-02
P611265	P611252	P611256	EQ1800038-03

Data Qualifiers

HRMS Qualifier Set

- B Indicates the associated analyte was found in the method blank at >1/10th the reported value.
- E Estimated value. The reported concentration is above the calibration range of the instrument.
- H Sample extracted and/or analyzed out of suggested holding time.
- J Estimated value. The reported concentration is below the MRL.
- K The ion abundance ratio between the primary and secondary ions were outside of theoretical acceptance limits. The concentration of this analyte should be considered as an estimate.
- P Chlorodiphenyl ether interference was present at the retention time of the target analyte. Reported result should be considered an estimate.
- Q Monitored lock-mass indicates matrix-interference. Reported result is estimated.
- S Signal saturated detector. Result reported from dilution.
- U Compound was analyzed for, but was not detected (ND).
- X See Case Narrative.
- Y Isotopically Labeled Standard recovery outside of acceptance limits. In all cases, the signal-to-noise ratios are greater than 10:1, making the recoveries acceptable.
 - i The MDL/MRL have been elevated due to a matrix interference.

ALS Laboratory Group

Acronyms

Cal	Calibration
Conc	CONCetration
Dioxin(s)	Polychlorinated dibenzo-p-dioxin(s)
EDL	Estimated Detection Limit
EMPC	Estimated Maximum Possible Concentration
Flags	Data qualifiers
Furan(s)	Polychlorinated dibenzofuran(s)
g	Grams
ICAL	Initial CALibration
ID	IDentifier
Ions	Masses monitored for the analyte during data acquisition
L	Liter (s)
LCS	Laboratory Control Sample
DLCS	Duplicate Laboratory Control Sample
MB	Method Blank
MCL	Method Calibration Limit
MDL	Method Detection Limit
mL	Milliliters
MS	Matrix Spiked sample
DMS	Duplicate Matrix Spiked sample
NO	Number of peaks meeting all identification criteria
PCDD(s)	Polychlorinated dibenzo-p-dioxin(s)
PCDF(s)	Polychlorinated dibenzofuran(s)
ppb	Parts per billion
ppm	Parts per million
ppq	Parts per quadrillion
ppt	Parts per trillion
QA	Quality Assurance
QC	Quality Control
Ratio	Ratio of areas from monitored ions for an analyte
% Rec.	Percent recovery
RPD	Relative Percent Difference
RRF	Relative Response Factor
RT	Retention Time
SDG	Sample Delivery Group
S/N	Signal-to-noise ratio
TEF	Toxicity Equivalence Factor
TEQ	Toxicity Equivalence Quotient



State Certifications, Accreditations, and Licenses

Agency	Number	Expire Date
Arizona Department of Health Services	AZ0793	5/27/2018
Arkansas Department of Environmental Quality	17-027-0	3/27/2018
California Department of Health Services	2452	2/28/2018
Florida Department of Health	E87611	7/31/2018
Hawaii Department of Health	TX02694	4/30/2018
Illinois Environmental Protection Agency	004112	5/9/2018
Louisiana Department of Environmental Quality	03048	6/30/2018
Louisiana Department of Health and Hospitals	LA150026	12/31/2018
Maine Center for Disease Control and Prevention	2014019	6/5/2018
Maryland Department of the Environment	343	6/30/2018
Michigan Department of Environmental Quality	9971	6/5/2018
Minnesota Department of Health	840911	12/31/2018
Nebraska Department of Health and Human Services	NE-OS-25-13	4/30/2018
Nevada Department of Conservation and Natural Resources	TX014112013-2	7/31/2018
New Jersey Department of Environmental Protection	NLC140001	6/30/2018
New Mexico Environment Department	TX02694	4/30/2018
New York Department of Health	11707	3/31/2018
Oklahoma Department of Environmental Quality	2014 124	8/31/2018
Oregon Environmental Laboratory Accreditation Program	TX200002-009	3/24/2018
Pennsylvania Department of Environmental Protection	68-03441	6/30/2018
Tennessee Department of Environment and Conservation	04016	6/30/2018
Texas Commission on Environmental Quality	TX104704231-17-18	4/30/2018
United States Department of Agriculture	P330-14-00067	6/19/2018
Utah Department of Health Environmental Laboratory Certification	TX02694	7/31/2018
Washington Department of Health	c819	11/14/2018
West Virginia Department of Environmental Protection	347	6/30/2018



Chain of Custody

ALS Environmental - Houston HRMS
10450 Stancliff Rd, Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com



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Subcontract Chain of Custody

COC ID: 8395

SUBCONTRACT TO:

ALS Environmental
10450 Stancliff Road Suite 210
Houston, TX 77084

Phone: +1 281 530 5656

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: Sonia West
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: Sonia.West@alsglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS18010694
TSR: Houston House Acct

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS18010694-32	17SS82-0.0-0.5	Soil	15 Jan 2018 09:55
	SUB_DIOXINS/FURANS			31 Jan 2018
2.	HS18010694-33	17SS80-0.0-0.5	Soil	15 Jan 2018 10:00
	SUB_DIOXINS/FURANS			31 Jan 2018
3.	HS18010694-34	17SS79-0.0-0.5	Soil	15 Jan 2018 10:05
	SUB_DIOXINS/FURANS			31 Jan 2018
4.	HS18010694-35	17SS81-0.0-0.5	Soil	15 Jan 2018 10:10
	SUB_DIOXINS/FURANS			31 Jan 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above. **DOD Level IV. Please analyze moisture for all samples**

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Williams

Date/Time: 1/19/18 16:00

Received By: [Signature]

Date/Time: 1/19/18 16:00

Cooler ID(s): _____

Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER





Cooler Receipt Form

Project Chemist NRClient/Project ALS EnvironmentalThermometer ID SMC4Date/Time Received: 1/19/18 16:00 Initials: AL Date/Time Logged in: 1/22/18 Initials: KL1. Method of delivery: ☐ US Mail ☐ Fed Ex ☐ UPS ☐ DHL ☐ Courier ☒ Client2. Samples received in: ☐ Cooler ☐ Box ☐ Envelope ☒ Other Hand Delivered

3. Were custody seals on coolers? ☐ Yes ☒ No If yes, how many and where? No Seals

Were they intact? ☐ Yes ☐ No ☒ N/A

Were they signed and dated? ☐ Yes ☐ No ☒ N/A

4. Packing Material: ☐ Inserts ☒ Baggies ☐ Bubble Wrap ☐ Gel Packs ☐ Wet Ice ☐ Sleeves ☐ Other5. Foreign or Regulated Soil? ☐ Yes ☒ No Location of Sampling:

Cooler Tracking Number	COC ID	Date Opened	Time Opened	Opened By	Temp. °C	Temp Blank?
<u>N/A</u>		<u>1/19/18</u>	<u>16:00</u>	<u>AL</u>	<u>7.5/7.9</u>	☐
						☐
						☐
						☐

6. Were custody papers properly filled out (ink, signed, dated, etc)? ☒ Yes ☐ No
7. Did all bottles arrive in good condition (not broken, no signs of leakage)? ☒ Yes ☐ No
8. Were all sample labels complete (i.e., sample ID, analysis, preservation, etc)? ☒ Yes ☐ No
9. Were appropriate bottles/containers and volumes received for the requested tests? ☒ Yes ☐ No
10. Did sample labels and tags agree with custody documents? ☒ Yes ☐ No

Notes, Discrepancies, & Resolutions:

Service request Label:

E1800052**5**ALS Laboratory Group
Misc Project



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SAMPLE ACCEPTANCE POLICY

This policy outlines the criteria samples must meet to be accepted by ALS Environmental – Houston HRMS.

Cooler Custody Seals (desirable, mandatory if specified in SAP):

- ✓ Intact on outside of cooler, signed and dated

Chain-of-Custody (COC) documentation (mandatory):

The following is required on each COC:

- ✓ Sample ID, the location, date and time of collection, collector's name, preservation type, sample type, and any other special remarks concerning the sample. The COC must be completed in ink.
- ✓ Signature and date of relinquishing party.

In the absence of a COC at sample receipt, the COC will be requested from the client.

Sample Integrity (mandatory):

Samples are inspected upon arrival to ensure that sample integrity was not compromised during transfer to the laboratory.

- ✓ Sample containers must arrive in good condition (not broken or leaking).
- ✓ Samples must be labeled appropriately, including Sample IDs, and requested test using durable labels and indelible ink.
- ✓ The correct type of sample bottle must be used for the method requested.
- ✓ An appropriate sample volume, or weight, must be received.
- ✓ Sample IDs and number of containers must reconcile with the COC.
- ✓ Samples must be received within the method defined holding time.

Temperature Requirement (varies by sample matrix):

- ✓ Aqueous and Non-aqueous samples must be shipped and stored cold, at 0 to 6°C.
- ✓ Tissue samples must be shipped and stored frozen, at -20 to -10°C.
- ✓ Air samples are shipped and stored cold, at 0 to 6°C
- ✓ The sample temperature must be recorded on the COC

All cooler inspections are documented on the Cooler Receipt Form (CRF). A separate CRF is completed for each service request. Any samples not meeting the above criteria are noted on the CRF and the Project Manager notified. The Project Manager must resolve any sample integrity issues with the client prior to proceeding with the analysis. Such resolutions are documented in writing and filed with the project folder. Data associated with samples received outside of this acceptance policy will be qualified on the case narrative of the final report



Preparation Information Benchsheets

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Preparation Information Benchsheet

Prep Run#: 307042
Team: Semivoa GCMS/JRAMIREZ

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 1/23/18 01:00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Cl	Matrix	Amt. Ext.	Sample Description
1	E1800052-001	17SS82-0.0-0.5	.01	8290/PCDD PCDF	x	x	Soil	10.607g	Moist Brown Soil
2	E1800052-002	17SS80-0.0-0.5	.01	8290/PCDD PCDF	x	x	Soil	10.100g	Moist Brown Soil
3	E1800052-003	17SS79-0.0-0.5	.01	8290/PCDD PCDF	x	x	Soil	10.168g	Moist Brown Soil
4	E1800052-004	17SS81-0.0-0.5	.01	8290/PCDD PCDF	x	x	Soil	10.548g	Moist Brown Soil
5	EQ1800038-01	MB		8290/PCDD PCDF	x	x	Solid	10.317g	
6	EQ1800038-02	LCS		8290/PCDD PCDF	x	x	Solid	10.742g	
7	EQ1800038-03	DLCS		8290/PCDD PCDF	x	x	Solid	10.625g	

Spiking Solutions

Name:	1613B Matrix Working Standard	Inventory ID	186997	Logbook Ref:	186997 JG 1/8/17 2-20 ng/mL	Expires On:	07/07/2018
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EQ1800038-02 100.00µL EQ1800038-03 100.00µL

Name:	8290/1613B Cleanup Working Standard	Inventory ID	187025	Logbook Ref:	187025 AL 1/9/18 8 ng/mL	Expires On:	04/28/2018
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E1800052-001 100.00µL E1800052-002 100.00µL E1800052-003 100.00µL E1800052-004 100.00µL EQ1800038-01 100.00µL EQ1800038-02 100.00µL
EQ1800038-03 100.00µL

Name:	1613B Labeled Working Standard	Inventory ID	187485	Logbook Ref:	187485 JR 1/23/18 2-4ng/mL	Expires On:	06/25/2018
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E1800052-001 1,000.00µL E1800052-002 1,000.00µL E1800052-003 1,000.00µL E1800052-004 1,000.00µL EQ1800038-01 1,000.00µL EQ1800038-02 1,000.00µL
EQ1800038-03 1,000.00µL

Preparation Materials

Carbon, High Purity	JG 12/27/17 (186784)	Ethyl Acetate 99.9% Minimum EtOAc	AL 3/3/17 (179750)	Glass Wool	AL 12/28/17 (186762)
Hexanes 95%	JG 1/17/19 (187391)	Dichloromethane (Methylene Chloride) 99.9% MeCl2	AL 1/22/18 (187426)	Sodium Hydroxide 1N NaOH	sodium hydroxide (180303)
Sodium Sulfate Anhydrous Reagent Grade Na2SO4	JG 1/3/18 (186882)	Tridecane (n-Tridecane)	JG 9/21/17 (184157)	Silica Gel	JG 10/25/17 (185070)
sulfuric acid	AL 10/11/17 (184727)	Toluene 99.9% Minimum	JG 1/17/19 (187390)		

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	1/23/18 13:00	Started:	1/25/18 18:00	Started:	1/26/18 10:30	Started:	1/29/18 10:30
Finished:	1/24/18 07:30	Finished:	1/25/18 19:00	Finished:	1/26/18 12:30	Finished:	1/29/18 11:30
By:	ALOPEZ	By:	JGHOSH	By:	JGHOSH	By:	JGHOSH
Comments		Comments		Comments		Comments	

E1800052

17 of 346

Preparation Information Benchsheet

Prep Run#: 307042
Team: Semivoa GCMS/JRAMIREZ

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 1/23/18 01:00 PM

Comments: _____

Reviewed By: JG Date: 1/30/2018

Chain of Custody

Relinquished By: _____	Date: _____	<u>Extracts Examined</u> Yes No
Received By: _____	Date: _____	

E1800052



Analytical Results

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston, TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 09:55
Date Received: 01/19/18 16:00

Sample Name: 17SS82-0.0-0.5
Lab Code: E1800052-001

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.607g

Data File Name: P611259
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 17:23
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0853	1.78	1.78			1
1,2,3,7,8-PeCDD	0.386	JK	0.0442	1.78	2.96	1.31	1.001	1
1,2,3,4,7,8-HxCDD	0.802	J	0.0426	1.78	2.96	1.26	1.000	1
1,2,3,6,7,8-HxCDD	3.05		0.0469	1.78	2.96	1.28	1.000	1
1,2,3,7,8,9-HxCDD	1.73	J	0.0420	1.78	2.96	1.28	1.006	1
1,2,3,4,6,7,8-HpCDD	104		0.783	1.78	2.96	1.03	1.000	1
OCDD	2920		0.833	3.56	5.93	0.91	1.000	1
2,3,7,8-TCDF	ND	U	0.0405	1.78	1.78			1
1,2,3,7,8-PeCDF	0.0849	JK	0.0398	1.78	2.96	1.19	1.001	1
2,3,4,7,8-PeCDF	0.139	J	0.0394	1.78	2.96	1.42	1.000	1
1,2,3,4,7,8-HxCDF	0.382	J	0.0535	1.78	2.96	1.39	1.000	1
1,2,3,6,7,8-HxCDF	0.352	J	0.0546	1.78	2.96	1.26	1.000	1
1,2,3,7,8,9-HxCDF	0.241	J	0.0565	1.78	2.96	1.17	1.000	1
2,3,4,6,7,8-HxCDF	0.496	J	0.0541	1.78	2.96	1.16	1.000	1
1,2,3,4,6,7,8-HpCDF	15.6	P	0.0566	1.78	2.96	1.05	1.000	1
1,2,3,4,7,8,9-HpCDF	0.667	J	0.0778	1.78	2.96	0.97	1.000	1
OCDF	68.5		0.0845	3.56	5.93	0.91	1.005	1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 09:55
Date Received: 01/19/18 16:00

Sample Name: 17SS82-0.0-0.5
Lab Code: E1800052-001

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.607g

Data File Name: P611259
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 17:23
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	ND	U	0.0853	0.356	0.593			1
Total Penta-Dioxins	1.57J		0.0442	1.78	2.96	1.41		1
Total Hexa-Dioxins	23.2		0.0438	5.34	5.34	1.29		1
Total Hepta-Dioxins	197		0.783	1.78	2.96	1.04		1
Total Tetra-Furans	0.857		0.0405	0.356	0.593	0.83		1
Total Penta-Furans	1.23J		0.0743	3.56	3.56	1.33		1
Total Hexa-Furans	13.5		0.0547	7.12	7.12	1.20		1
Total Hepta-Furans	55.8		0.0662	3.56	3.56	1.05		1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 09:55
Date Received: 01/19/18 16:00

Sample Name: 17SS82-0.0-0.5
Lab Code: E1800052-001

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.607g

Data File Name: P611259
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 17:23
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1079.762	54		40-135	0.79	1.022
13C-1,2,3,7,8-PeCDD	2000	1706.646	85		40-135	1.55	1.189
13C-1,2,3,4,7,8-HxCDD	2000	1562.984	78		40-135	1.30	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1449.389	72		40-135	1.19	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1286.249	64		40-135	1.07	1.066
13C-OCDD	4000	1785.679	45		40-135	0.90	1.139
13C-2,3,7,8-TCDF	2000	1337.208	67		40-135	0.80	0.993
13C-1,2,3,7,8-PeCDF	2000	1740.505	87		40-135	1.58	1.146
13C-2,3,4,7,8-PeCDF	2000	1730.174	87		40-135	1.60	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1489.997	74		40-135	0.52	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1473.654	74		40-135	0.52	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1581.075	79		40-135	0.51	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1510.235	76		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	1160.585	58		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1142.061	57		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	548.043	69		40-135	NA	1.023

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 09:55
Date Received: 01/19/18 16:00

Sample Name: 17SS82-0.0-0.5
Lab Code: E1800052-001

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.0853	1.78	1	1	
1,2,3,7,8-PeCDD	0.386	0.0442	2.96	1	1	0.386
1,2,3,4,7,8-HxCDD	0.802	0.0426	2.96	1	0.1	0.0802
1,2,3,6,7,8-HxCDD	3.05	0.0469	2.96	1	0.1	0.305
1,2,3,7,8,9-HxCDD	1.73	0.0420	2.96	1	0.1	0.173
1,2,3,4,6,7,8-HpCDD	104	0.783	2.96	1	0.01	1.04
OCDD	2920	0.833	5.93	1	0.0003	0.876
2,3,7,8-TCDF	ND	0.0405	1.78	1	0.1	
1,2,3,7,8-PeCDF	0.0849	0.0398	2.96	1	0.03	0.00255
2,3,4,7,8-PeCDF	0.139	0.0394	2.96	1	0.3	0.0417
1,2,3,4,7,8-HxCDF	0.382	0.0535	2.96	1	0.1	0.0382
1,2,3,6,7,8-HxCDF	0.352	0.0546	2.96	1	0.1	0.0352
1,2,3,7,8,9-HxCDF	0.241	0.0565	2.96	1	0.1	0.0241
2,3,4,6,7,8-HxCDF	0.496	0.0541	2.96	1	0.1	0.0496
1,2,3,4,6,7,8-HpCDF	15.6	0.0566	2.96	1	0.01	0.156
1,2,3,4,7,8,9-HpCDF	0.667	0.0778	2.96	1	0.01	0.00667
OCDF	68.5	0.0845	5.93	1	0.0003	0.0206
Total TEQ						3.23

2005 WHO TEFs, ND = 0

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Sample Name: 17SS82-0.0-0.5
Lab Code: E1800052-001

Service Request: E1800052
Date Collected: 01/15/18 09:55
Date Received: 01/19/18 16:00

Units: Percent
Basis: As Received

Total Solids

Analysis Method: ALS SOP
5.179g

Date Analyzed: 01/25/18 18:51
NA
E-Balance-01

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Solids	79.5		-	-	-			1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:00
Date Received: 01/19/18 16:00

Sample Name: 17SS80-0.0-0.5
Lab Code: E1800052-002

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.100g

Data File Name: P611260
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 18:12
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0901	1.82	1.82			1
1,2,3,7,8-PeCDD	0.363	JK	0.0394	1.82	3.03	1.17	1.001	1
1,2,3,4,7,8-HxCDD	0.623	J	0.0436	1.82	3.03	1.14	1.000	1
1,2,3,6,7,8-HxCDD	1.83	J	0.0477	1.82	3.03	1.34	1.000	1
1,2,3,7,8,9-HxCDD	1.22	J	0.0429	1.82	3.03	1.37	1.006	1
1,2,3,4,6,7,8-HpCDD	51.5		0.284	1.82	3.03	1.03	1.000	1
OCDD	1560		1.14	3.63	6.05	0.91	1.000	1
2,3,7,8-TCDF	ND	U	0.0514	1.82	1.82			1
1,2,3,7,8-PeCDF	0.109	JK	0.0491	1.82	3.03	1.22	1.001	1
2,3,4,7,8-PeCDF	0.160	J	0.0489	1.82	3.03	1.64	1.001	1
1,2,3,4,7,8-HxCDF	0.256	J	0.0210	1.82	3.03	1.15	1.000	1
1,2,3,6,7,8-HxCDF	0.264	J	0.0209	1.82	3.03	1.16	1.001	1
1,2,3,7,8,9-HxCDF	0.159	JK	0.0224	1.82	3.03	0.98	1.000	1
2,3,4,6,7,8-HxCDF	0.379	J	0.0210	1.82	3.03	1.38	1.000	1
1,2,3,4,6,7,8-HpCDF	7.11	P	0.0529	1.82	3.03	1.07	1.000	1
1,2,3,4,7,8,9-HpCDF	0.332	J	0.0705	1.82	3.03	1.06	1.000	1
OCDF	27.1		0.108	3.63	6.05	0.88	1.005	1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:00
Date Received: 01/19/18 16:00

Sample Name: 17SS80-0.0-0.5
Lab Code: E1800052-002

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.100g

Data File Name: P611260
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 18:12
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	ND	U	0.0901	0.363	0.605			1
Total Penta-Dioxins	1.03J		0.0394	1.82	3.03	1.61		1
Total Hexa-Dioxins	14.1		0.0447	5.45	5.45	1.25		1
Total Hepta-Dioxins	102		0.284	1.82	3.03	1.04		1
Total Tetra-Furans	2.90		0.0514	0.363	0.605	0.69		1
Total Penta-Furans	1.04J		0.0758	3.63	3.63	1.73		1
Total Hexa-Furans	7.20J		0.0214	7.26	7.26	1.19		1
Total Hepta-Furans	21.7		0.0609	3.63	3.63	1.07		1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:00
Date Received: 01/19/18 16:00

Sample Name: 17SS80-0.0-0.5
Lab Code: E1800052-002

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.100g

Data File Name: P611260
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 18:12
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1040.253	52		40-135	0.78	1.021
13C-1,2,3,7,8-PeCDD	2000	1712.930	86		40-135	1.55	1.189
13C-1,2,3,4,7,8-HxCDD	2000	1470.169	74		40-135	1.29	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1351.936	68		40-135	1.20	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1160.382	58		40-135	1.07	1.066
13C-OCDD	4000	1447.423	36	Y	40-135	0.90	1.139
13C-2,3,7,8-TCDF	2000	837.009	42		40-135	0.78	0.992
13C-1,2,3,7,8-PeCDF	2000	1709.601	85		40-135	1.58	1.146
13C-2,3,4,7,8-PeCDF	2000	1716.610	86		40-135	1.61	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1387.673	69		40-135	0.52	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1392.778	70		40-135	0.51	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1406.337	70		40-135	0.52	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1407.822	70		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	1058.760	53		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1079.893	54		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	545.330	68		40-135	NA	1.023

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:00
Date Received: 01/19/18 16:00

Sample Name: 17SS80-0.0-0.5
Lab Code: E1800052-002

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	ND	0.0901	1.82	1	1	
1,2,3,7,8-PeCDD	0.363	0.0394	3.03	1	1	0.363
1,2,3,4,7,8-HxCDD	0.623	0.0436	3.03	1	0.1	0.0623
1,2,3,6,7,8-HxCDD	1.83	0.0477	3.03	1	0.1	0.183
1,2,3,7,8,9-HxCDD	1.22	0.0429	3.03	1	0.1	0.122
1,2,3,4,6,7,8-HpCDD	51.5	0.284	3.03	1	0.01	0.515
OCDD	1560	1.14	6.05	1	0.0003	0.468
2,3,7,8-TCDF	ND	0.0514	1.82	1	0.1	
1,2,3,7,8-PeCDF	0.109	0.0491	3.03	1	0.03	0.00327
2,3,4,7,8-PeCDF	0.160	0.0489	3.03	1	0.3	0.0480
1,2,3,4,7,8-HxCDF	0.256	0.0210	3.03	1	0.1	0.0256
1,2,3,6,7,8-HxCDF	0.264	0.0209	3.03	1	0.1	0.0264
1,2,3,7,8,9-HxCDF	0.159	0.0224	3.03	1	0.1	0.0159
2,3,4,6,7,8-HxCDF	0.379	0.0210	3.03	1	0.1	0.0379
1,2,3,4,6,7,8-HpCDF	7.11	0.0529	3.03	1	0.01	0.0711
1,2,3,4,7,8,9-HpCDF	0.332	0.0705	3.03	1	0.01	0.00332
OCDF	27.1	0.108	6.05	1	0.0003	0.00813
Total TEQ						1.95

2005 WHO TEFs, ND = 0

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Sample Name: 17SS80-0.0-0.5
Lab Code: E1800052-002

Service Request: E1800052
Date Collected: 01/15/18 10:00
Date Received: 01/19/18 16:00

Units: Percent
Basis: As Received

Total Solids

Analysis Method: ALS SOP
5.862g

Date Analyzed: 01/25/18 18:51
NA
E-Balance-01

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Solids	81.8		-	-	-			1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:05
Date Received: 01/19/18 16:00

Sample Name: 17SS79-0.0-0.5
Lab Code: E1800052-003

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.168g

Date Analyzed: 01/29/18 19:01
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Data File Name: P611261
ICAL Date: 01/26/18

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	0.113JK		0.0524	1.78	1.78	0.32	1.001	1
1,2,3,7,8-PeCDD	0.319J		0.0340	1.78	2.97	1.43	1.001	1
1,2,3,4,7,8-HxCDD	0.435J		0.0312	1.78	2.97	1.16	1.000	1
1,2,3,6,7,8-HxCDD	1.00J		0.0334	1.78	2.97	1.32	1.000	1
1,2,3,7,8,9-HxCDD	1.47J		0.0305	1.78	2.97	1.24	1.007	1
1,2,3,4,6,7,8-HpCDD	53.3		0.254	1.78	2.97	1.03	1.000	1
OCDD	2320		0.804	3.56	5.94	0.90	1.000	1
2,3,7,8-TCDF	ND	U	0.0299	1.78	1.78			1
1,2,3,7,8-PeCDF	0.0460J		0.0299	1.78	2.97	1.49	1.001	1
2,3,4,7,8-PeCDF	ND	U	0.0305	1.78	2.97			1
1,2,3,4,7,8-HxCDF	0.0871J		0.0246	1.78	2.97	1.09	1.000	1
1,2,3,6,7,8-HxCDF	0.112J		0.0244	1.78	2.97	1.36	1.000	1
1,2,3,7,8,9-HxCDF	0.127JK		0.0251	1.78	2.97	1.47	1.000	1
2,3,4,6,7,8-HxCDF	0.133J		0.0245	1.78	2.97	1.26	1.000	1
1,2,3,4,6,7,8-HpCDF	2.18J		0.0301	1.78	2.97	1.15	1.000	1
1,2,3,4,7,8,9-HpCDF	0.0956JK		0.0378	1.78	2.97	1.90	1.000	1
OCDF	8.25		0.0762	3.56	5.94	0.85	1.005	1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:05
Date Received: 01/19/18 16:00

Sample Name: 17SS79-0.0-0.5
Lab Code: E1800052-003

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.168g

Data File Name: P611261
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 19:01
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	0.185J		0.0524	0.356	0.594	0.76		1
Total Penta-Dioxins	2.08J		0.0340	1.78	2.97	1.76		1
Total Hexa-Dioxins	20.9		0.0316	5.34	5.34	1.27		1
Total Hepta-Dioxins	135		0.254	1.78	2.97	1.04		1
Total Tetra-Furans	0.744		0.0299	0.356	0.594	0.80		1
Total Penta-Furans	0.247J		0.0744	3.56	3.56	1.67		1
Total Hexa-Furans	1.90J		0.0246	7.13	7.13	1.40		1
Total Hepta-Furans	6.40		0.0337	3.56	3.56	1.15		1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:05
Date Received: 01/19/18 16:00

Sample Name: 17SS79-0.0-0.5
Lab Code: E1800052-003

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.168g

Date Analyzed: 01/29/18 19:01
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Data File Name: P611261
ICAL Date: 01/26/18

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1074.045	54		40-135	0.78	1.021
13C-1,2,3,7,8-PeCDD	2000	1721.592	86		40-135	1.56	1.188
13C-1,2,3,4,7,8-HxCDD	2000	1522.118	76		40-135	1.26	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1448.187	72		40-135	1.26	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1276.603	64		40-135	1.07	1.066
13C-OCDD	4000	1697.590	42		40-135	0.91	1.139
13C-2,3,7,8-TCDF	2000	1351.747	68		40-135	0.80	0.993
13C-1,2,3,7,8-PeCDF	2000	1752.714	88		40-135	1.59	1.145
13C-2,3,4,7,8-PeCDF	2000	1752.708	88		40-135	1.59	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1456.643	73		40-135	0.52	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1449.624	72		40-135	0.52	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1544.189	77		40-135	0.52	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1487.436	74		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	1172.639	59		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1235.726	62		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	543.310	68		40-135	NA	1.023

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:05
Date Received: 01/19/18 16:00

Sample Name: 17SS79-0.0-0.5
Lab Code: E1800052-003

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	0.113	0.0524	1.78	1	1	0.113
1,2,3,7,8-PeCDD	0.319	0.0340	2.97	1	1	0.319
1,2,3,4,7,8-HxCDD	0.435	0.0312	2.97	1	0.1	0.0435
1,2,3,6,7,8-HxCDD	1.00	0.0334	2.97	1	0.1	0.100
1,2,3,7,8,9-HxCDD	1.47	0.0305	2.97	1	0.1	0.147
1,2,3,4,6,7,8-HpCDD	53.3	0.254	2.97	1	0.01	0.533
OCDD	2320	0.804	5.94	1	0.0003	0.696
2,3,7,8-TCDF	ND	0.0299	1.78	1	0.1	
1,2,3,7,8-PeCDF	0.0460	0.0299	2.97	1	0.03	0.00138
2,3,4,7,8-PeCDF	ND	0.0305	2.97	1	0.3	
1,2,3,4,7,8-HxCDF	0.0871	0.0246	2.97	1	0.1	0.00871
1,2,3,6,7,8-HxCDF	0.112	0.0244	2.97	1	0.1	0.0112
1,2,3,7,8,9-HxCDF	0.127	0.0251	2.97	1	0.1	0.0127
2,3,4,6,7,8-HxCDF	0.133	0.0245	2.97	1	0.1	0.0133
1,2,3,4,6,7,8-HpCDF	2.18	0.0301	2.97	1	0.01	0.0218
1,2,3,4,7,8,9-HpCDF	0.0956	0.0378	2.97	1	0.01	0.000956
OCDF	8.25	0.0762	5.94	1	0.0003	0.00248
Total TEQ						2.02

2005 WHO TEFs, ND = 0

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Sample Name: 17SS79-0.0-0.5
Lab Code: E1800052-003

Service Request: E1800052
Date Collected: 01/15/18 10:05
Date Received: 01/19/18 16:00

Units: Percent
Basis: As Received

Total Solids

Analysis Method: ALS SOP
5.32g

Date Analyzed: 01/25/18 18:51
NA
E-Balance-01

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Solids	82.8		-	-	-			1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:10
Date Received: 01/19/18 16:00

Sample Name: 17SS81-0.0-0.5
Lab Code: E1800052-004

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.548g

Data File Name: P611262
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 19:50
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	0.575 JK		0.0614	1.79	1.79	0.60	1.001	1
1,2,3,7,8-PeCDD	3.58		0.0415	1.79	2.98	1.39	1.001	1
1,2,3,4,7,8-HxCDD	8.19		0.0378	1.79	2.98	1.28	1.000	1
1,2,3,6,7,8-HxCDD	29.0		0.0417	1.79	2.98	1.27	1.000	1
1,2,3,7,8,9-HxCDD	13.3		0.0373	1.79	2.98	1.30	1.007	1
1,2,3,4,6,7,8-HpCDD	766		0.505	1.79	2.98	1.02	1.000	1
OCDD	6320 E		0.122	3.57	5.96	0.91	1.000	1
2,3,7,8-TCDF	0.696 J		0.0274	1.79	1.79	0.71	1.001	1
1,2,3,7,8-PeCDF	1.14 J		0.0346	1.79	2.98	1.55	1.001	1
2,3,4,7,8-PeCDF	2.59 J		0.0361	1.79	2.98	1.48	1.001	1
1,2,3,4,7,8-HxCDF	9.01		0.0924	1.79	2.98	1.22	1.000	1
1,2,3,6,7,8-HxCDF	4.43		0.0907	1.79	2.98	1.25	1.000	1
1,2,3,7,8,9-HxCDF	1.43 J		0.0902	1.79	2.98	1.14	1.001	1
2,3,4,6,7,8-HxCDF	5.86		0.0938	1.79	2.98	1.20	1.000	1
1,2,3,4,6,7,8-HpCDF	141 P		0.0797	1.79	2.98	1.05	1.000	1
1,2,3,4,7,8,9-HpCDF	6.82		0.118	1.79	2.98	1.04	1.000	1
OCDF	546		0.0525	3.57	5.96	0.90	1.005	1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:10
Date Received: 01/19/18 16:00

Sample Name: 17SS81-0.0-0.5
Lab Code: E1800052-004

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.548g

Data File Name: P611262
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 19:50
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	6.05		0.0614	0.357	0.596	0.87		1
Total Penta-Dioxins	35.9		0.0415	1.79	2.98	1.58		1
Total Hexa-Dioxins	184		0.0389	5.36	5.36	1.27		1
Total Hepta-Dioxins	1290		0.505	1.79	2.98	1.03		1
Total Tetra-Furans	12.6		0.0274	0.357	0.596	0.87		1
Total Penta-Furans	28.3		0.0746	3.57	3.57	1.55		1
Total Hexa-Furans	162		0.0918	7.15	7.15	1.25		1
Total Hepta-Furans	483		0.0962	3.57	3.57	1.05		1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:10
Date Received: 01/19/18 16:00

Sample Name: 17SS81-0.0-0.5
Lab Code: E1800052-004

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.548g

Data File Name: P611262
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 19:50
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1110.565	56		40-135	0.79	1.021
13C-1,2,3,7,8-PeCDD	2000	1696.760	85		40-135	1.56	1.188
13C-1,2,3,4,7,8-HxCDD	2000	1486.661	74		40-135	1.25	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1390.020	70		40-135	1.23	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1259.360	63		40-135	1.07	1.066
13C-OCDD	4000	1554.055	39	Y	40-135	0.90	1.139
13C-2,3,7,8-TCDF	2000	1377.792	69		40-135	0.80	0.993
13C-1,2,3,7,8-PeCDF	2000	1794.453	90		40-135	1.60	1.145
13C-2,3,4,7,8-PeCDF	2000	1727.506	86		40-135	1.59	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1396.086	70		40-135	0.52	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1399.312	70		40-135	0.52	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1551.581	78		40-135	0.52	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1450.927	73		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	1178.789	59		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1072.061	54		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	568.336	71		40-135	NA	1.022

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: 01/15/18 10:10
Date Received: 01/19/18 16:00

Sample Name: 17SS81-0.0-0.5
Lab Code: E1800052-004

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method

Toxicity Equivalency Quotient

Analyte Name	Result	DL	MRL	Dilution Factor	TEF	TEF - Adjusted Concentration
2,3,7,8-TCDD	0.575	0.0614	1.79	1	1	0.575
1,2,3,7,8-PeCDD	3.58	0.0415	2.98	1	1	3.58
1,2,3,4,7,8-HxCDD	8.19	0.0378	2.98	1	0.1	0.819
1,2,3,6,7,8-HxCDD	29.0	0.0417	2.98	1	0.1	2.90
1,2,3,7,8,9-HxCDD	13.3	0.0373	2.98	1	0.1	1.33
1,2,3,4,6,7,8-HpCDD	766	0.505	2.98	1	0.01	7.66
OCDD	6320	0.122	5.96	1	0.0003	1.90
2,3,7,8-TCDF	0.696	0.0274	1.79	1	0.1	0.0696
1,2,3,7,8-PeCDF	1.14	0.0346	2.98	1	0.03	0.0342
2,3,4,7,8-PeCDF	2.59	0.0361	2.98	1	0.3	0.777
1,2,3,4,7,8-HxCDF	9.01	0.0924	2.98	1	0.1	0.901
1,2,3,6,7,8-HxCDF	4.43	0.0907	2.98	1	0.1	0.443
1,2,3,7,8,9-HxCDF	1.43	0.0902	2.98	1	0.1	0.143
2,3,4,6,7,8-HxCDF	5.86	0.0938	2.98	1	0.1	0.586
1,2,3,4,6,7,8-HpCDF	141	0.0797	2.98	1	0.01	1.41
1,2,3,4,7,8,9-HpCDF	6.82	0.118	2.98	1	0.01	0.0682
OCDF	546	0.0525	5.96	1	0.0003	0.164
Total TEQ						23.4

2005 WHO TEFs, ND = 0

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Sample Name: 17SS81-0.0-0.5
Lab Code: E1800052-004

Service Request: E1800052
Date Collected: 01/15/18 10:10
Date Received: 01/19/18 16:00

Units: Percent
Basis: As Received

Total Solids

Analysis Method: ALS SOP
5.393g

Date Analyzed: 01/25/18 18:51
NA
E-Balance-01

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Solids	79.6		-	-	-			1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: EQ1800038-01

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.317g

Data File Name: P611256
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 14:55
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.113	1.50	1.50			1
1,2,3,7,8-PeCDD	ND	U	0.0325	1.50	2.42			1
1,2,3,4,7,8-HxCDD	ND	U	0.0264	1.50	2.42			1
1,2,3,6,7,8-HxCDD	ND	U	0.0291	1.50	2.42			1
1,2,3,7,8,9-HxCDD	ND	U	0.0260	1.50	2.42			1
1,2,3,4,6,7,8-HpCDD	0.0644JK		0.0319	1.50	2.42	0.50	1.000	1
OCDD	0.546JK		0.0940	3.00	4.85	1.06	1.000	1
2,3,7,8-TCDF	ND	U	0.0418	1.50	1.50			1
1,2,3,7,8-PeCDF	ND	U	0.0258	1.50	2.42			1
2,3,4,7,8-PeCDF	ND	U	0.0257	1.50	2.42			1
1,2,3,4,7,8-HxCDF	ND	U	0.0193	1.50	2.42			1
1,2,3,6,7,8-HxCDF	ND	U	0.0198	1.50	2.42			1
1,2,3,7,8,9-HxCDF	ND	U	0.0221	1.50	2.42			1
2,3,4,6,7,8-HxCDF	ND	U	0.0203	1.50	2.42			1
1,2,3,4,6,7,8-HpCDF	ND	U	0.0294	1.50	2.42			1
1,2,3,4,7,8,9-HpCDF	ND	U	0.0344	1.50	2.42			1
OCDF	ND	U	0.0865	3.00	4.85			1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: EQ1800038-01

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.317g

Data File Name: P611256
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 14:55
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	ND	U	0.113	0.300	0.485			1
Total Penta-Dioxins	ND	U	0.0325	1.50	2.42			1
Total Hexa-Dioxins	ND	U	0.0271	4.50	4.50			1
Total Hepta-Dioxins	ND	U	0.0319	1.50	2.42			1
Total Tetra-Furans	ND	U	0.0418	0.300	0.485			1
Total Penta-Furans	ND	U	0.0258	3.00	3.00			1
Total Hexa-Furans	ND	U	0.0204	6.00	6.00			1
Total Hepta-Furans	ND	U	0.0317	3.00	3.00			1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Method Blank
Lab Code: EQ1800038-01

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.317g

Data File Name: P611256
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 14:55
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1030.507	52		40-135	0.79	1.021
13C-1,2,3,7,8-PeCDD	2000	1684.898	84		40-135	1.56	1.188
13C-1,2,3,4,7,8-HxCDD	2000	1493.666	75		40-135	1.25	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1343.299	67		40-135	1.25	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1101.155	55		40-135	1.06	1.066
13C-OCDD	4000	1316.025	33	Y	40-135	0.90	1.139
13C-2,3,7,8-TCDF	2000	1262.890	63		40-135	0.81	0.993
13C-1,2,3,7,8-PeCDF	2000	1704.490	85		40-135	1.58	1.145
13C-2,3,4,7,8-PeCDF	2000	1702.919	85		40-135	1.59	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1387.808	69		40-135	0.52	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1365.808	68		40-135	0.52	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1363.398	68		40-135	0.52	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1347.353	67		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	978.700	49		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1111.383	56		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	509.206	64		40-135	NA	1.022



Accuracy & Precision

ALS Environmental - Houston HRMS
10450 Stancliff Rd., Suite 210, Houston TX 77099
Phone (713)266-1599 Fax (713)266-0130
www.alsglobal.com

QA/QC Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Analyzed: 01/29/18
Date Extracted: 01/23/18

Duplicate Lab Control Sample Summary
Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method

Units: ng/Kg
Basis: Dry
Analysis Lot: 578615

Lab Control Sample EQ1800038-02				Duplicate Lab Control Sample EQ1800038-03				% Rec		
Analyte Name	Result	Spike Amount	% Rec	Result	Spike Amount	% Rec	Limits	RPD	RPD Limit	
1,2,3,4,6,7,8-HpCDD	87.9	93.1	94	88.8	94.1	94	76-125	1	20	
1,2,3,4,7,8-HxCDD	92.9	93.1	100	92.3	94.1	98	72-131	<1	20	
1,2,3,6,7,8-HxCDD	99.4	93.1	107	98.3	94.1	104	74-134	1	20	
1,2,3,7,8,9-HxCDD	94.1	93.1	101	92.3	94.1	98	71-138	2	20	
1,2,3,7,8-PeCDD	97.1	93.1	104	99.1	94.1	105	74-125	2	20	
2,3,7,8-TCDD	23.9	18.6	129 *	24.3	18.8	129 *	70-128	1	20	
OCDD	187	186	100	188	188	100	73-135	<1	20	
1,2,3,4,6,7,8-HpCDF	92.9	93.1	100	92.8	94.1	99	73-135	<1	20	
1,2,3,4,7,8,9-HpCDF	96.5	93.1	104	95.9	94.1	102	72-131	<1	20	
1,2,3,4,7,8-HxCDF	94.7	93.1	102	95.7	94.1	102	77-130	1	20	
1,2,3,6,7,8-HxCDF	94.4	93.1	101	95.6	94.1	102	73-134	1	20	
1,2,3,7,8,9-HxCDF	86.5	93.1	93	86.2	94.1	92	74-135	<1	20	
1,2,3,7,8-PeCDF	86.2	93.1	93	86.3	94.1	92	77-131	<1	20	
2,3,4,6,7,8-HxCDF	95.5	93.1	103	96.1	94.1	102	74-133	<1	20	
2,3,4,7,8-PeCDF	96.0	93.1	103	95.8	94.1	102	75-128	<1	20	
2,3,7,8-TCDF	19.2	18.6	103	19.3	18.8	103	75-135	<1	20	
OCDF	213	186	114	209	188	111	66-144	2	20	

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Lab Control Sample
Lab Code: EQ1800038-02

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.742g

Data File Name: P611264
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 21:28
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	23.9		0.0509	1.50	1.50	0.78	1.001	1
1,2,3,7,8-PeCDD	97.1		0.0277	1.50	2.33	1.57	1.001	1
1,2,3,4,7,8-HxCDD	92.9		0.0519	1.50	2.33	1.27	1.000	1
1,2,3,6,7,8-HxCDD	99.4		0.0553	1.50	2.33	1.27	1.000	1
1,2,3,7,8,9-HxCDD	94.1		0.0504	1.50	2.33	1.30	1.007	1
1,2,3,4,6,7,8-HpCDD	87.9		0.0297	1.50	2.33	1.05	1.000	1
OCDD	187		0.127	3.00	4.65	0.91	1.000	1
2,3,7,8-TCDF	19.2		0.0175	1.50	1.50	0.77	1.001	1
1,2,3,7,8-PeCDF	86.2		0.0376	1.50	2.33	1.55	1.001	1
2,3,4,7,8-PeCDF	96.0		0.0370	1.50	2.33	1.55	1.001	1
1,2,3,4,7,8-HxCDF	94.7		0.0443	1.50	2.33	1.26	1.000	1
1,2,3,6,7,8-HxCDF	94.4		0.0434	1.50	2.33	1.23	1.000	1
1,2,3,7,8,9-HxCDF	86.5		0.0460	1.50	2.33	1.24	1.000	1
2,3,4,6,7,8-HxCDF	95.5		0.0444	1.50	2.33	1.23	1.000	1
1,2,3,4,6,7,8-HpCDF	92.9		0.0784	1.50	2.33	1.06	1.000	1
1,2,3,4,7,8,9-HpCDF	96.5		0.0945	1.50	2.33	1.07	1.000	1
OCDF	213		0.0369	3.00	4.65	0.91	1.006	1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Lab Control Sample
Lab Code: EQ1800038-02

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.742g

Data File Name: P611264
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 21:28
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	23.9		0.0509	0.300	0.465	0.78		1
Total Penta-Dioxins	97.1		0.0277	1.50	2.33	1.57		1
Total Hexa-Dioxins	286		0.0525	4.50	4.50	1.27		1
Total Hepta-Dioxins	88.4		0.0297	1.50	2.33	1.11		1
Total Tetra-Furans	20.4		0.0175	0.300	0.465	0.71		1
Total Penta-Furans	186		0.0373	3.00	3.00	1.61		1
Total Hexa-Furans	372		0.0445	6.00	6.00	1.29		1
Total Hepta-Furans	189		0.0861	3.00	3.00	1.06		1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Lab Control Sample
Lab Code: EQ1800038-02

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.742g

Data File Name: P611264
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 21:28
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	995.771	50		40-135	0.79	1.021
13C-1,2,3,7,8-PeCDD	2000	1638.948	82		40-135	1.56	1.188
13C-1,2,3,4,7,8-HxCDD	2000	1344.276	67		40-135	1.25	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1289.786	64		40-135	1.23	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1138.500	57		40-135	1.07	1.066
13C-OCDD	4000	1434.667	36	Y	40-135	0.90	1.139
13C-2,3,7,8-TCDF	2000	1259.119	63		40-135	0.81	0.993
13C-1,2,3,7,8-PeCDF	2000	1644.732	82		40-135	1.60	1.145
13C-2,3,4,7,8-PeCDF	2000	1677.400	84		40-135	1.60	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1309.708	65		40-135	0.51	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1294.647	65		40-135	0.52	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1366.287	68		40-135	0.53	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1328.899	66		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	1018.173	51		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1144.495	57		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	502.695	63		40-135	NA	1.022

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1800038-03

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.625g

Data File Name: P611265
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 22:18
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	24.3		0.0372	1.50	1.50	0.77	1.001	1
1,2,3,7,8-PeCDD	99.1		0.0253	1.50	2.35	1.56	1.001	1
1,2,3,4,7,8-HxCDD	92.3		0.0247	1.50	2.35	1.28	1.000	1
1,2,3,6,7,8-HxCDD	98.3		0.0267	1.50	2.35	1.28	1.000	1
1,2,3,7,8,9-HxCDD	92.3		0.0241	1.50	2.35	1.27	1.007	1
1,2,3,4,6,7,8-HpCDD	88.8		0.0311	1.50	2.35	1.03	1.000	1
OCDD	188		0.127	3.00	4.71	0.91	1.000	1
2,3,7,8-TCDF	19.3		0.0121	1.50	1.50	0.75	1.001	1
1,2,3,7,8-PeCDF	86.3		0.0254	1.50	2.35	1.55	1.001	1
2,3,4,7,8-PeCDF	95.8		0.0267	1.50	2.35	1.56	1.001	1
1,2,3,4,7,8-HxCDF	95.7		0.0220	1.50	2.35	1.24	1.001	1
1,2,3,6,7,8-HxCDF	95.6		0.0214	1.50	2.35	1.25	1.000	1
1,2,3,7,8,9-HxCDF	86.2		0.0223	1.50	2.35	1.25	1.000	1
2,3,4,6,7,8-HxCDF	96.1		0.0217	1.50	2.35	1.25	1.000	1
1,2,3,4,6,7,8-HpCDF	92.8		0.0606	1.50	2.35	1.05	1.000	1
1,2,3,4,7,8,9-HpCDF	95.9		0.0739	1.50	2.35	1.07	1.000	1
OCDF	209		0.0569	3.00	4.71	0.90	1.006	1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1800038-03

Units: ng/Kg
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.625g

Data File Name: P611265
ICAL Date: 01/26/18

Date Analyzed: 01/29/18 22:18
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Native Analyte Results

Analyte Name	Result	Q	EDL	LOD	LOQ	Ion Ratio	RRT	Dilution Factor
Total Tetra-Dioxins	24.3		0.0372	0.300	0.471	0.77		1
Total Penta-Dioxins	99.1		0.0253	1.50	2.35	1.56		1
Total Hexa-Dioxins	283		0.0252	4.50	4.50	1.28		1
Total Hepta-Dioxins	89.3		0.0311	1.50	2.35	1.02		1
Total Tetra-Furans	20.7		0.0121	0.300	0.471	0.71		1
Total Penta-Furans	185		0.0260	3.00	3.00	1.52		1
Total Hexa-Furans	374		0.0218	6.00	6.00	1.06		1
Total Hepta-Furans	189		0.0668	3.00	3.00	1.05		1

Analytical Report

Client: ALS Environmental - US
Project: HS18010694 Dioxins Furans Analysis
Sample Matrix: Soil

Service Request: E1800052
Date Collected: NA
Date Received: NA

Sample Name: Duplicate Lab Control Sample
Lab Code: EQ1800038-03

Units: Percent
Basis: Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analysis Method: 8290
Prep Method: Method
Sample Amount: 10.625g

Date Analyzed: 01/29/18 22:18
Date Extracted: 1/23/18
Instrument Name: E-HRMS-08
GC Column: DB-5MSUI
Blank File Name: P611256
Cal Ver. File Name: P611252

Data File Name: P611265
ICAL Date: 01/26/18

Labeled Standard Results

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	% Rec	Q	Control Limits	Ion Ratio	RRT
13C-2,3,7,8-TCDD	2000	1087.617	54		40-135	0.79	1.021
13C-1,2,3,7,8-PeCDD	2000	1628.091	81		40-135	1.56	1.188
13C-1,2,3,4,7,8-HxCDD	2000	1463.711	73		40-135	1.26	0.991
13C-1,2,3,6,7,8-HxCDD	2000	1415.710	71		40-135	1.24	0.994
13C-1,2,3,4,6,7,8-HpCDD	2000	1256.939	63		40-135	1.07	1.066
13C-OCDD	4000	1658.826	41		40-135	0.90	1.139
13C-2,3,7,8-TCDF	2000	1352.251	68		40-135	0.80	0.993
13C-1,2,3,7,8-PeCDF	2000	1695.786	85		40-135	1.60	1.145
13C-2,3,4,7,8-PeCDF	2000	1659.273	83		40-135	1.58	1.179
13C-1,2,3,4,7,8-HxCDF	2000	1378.860	69		40-135	0.52	0.971
13C-1,2,3,6,7,8-HxCDF	2000	1386.286	69		40-135	0.52	0.974
13C-1,2,3,7,8,9-HxCDF	2000	1503.877	75		40-135	0.52	1.008
13C-2,3,4,6,7,8-HxCDF	2000	1436.355	72		40-135	0.52	0.988
13C-1,2,3,4,6,7,8-HpCDF	2000	1142.929	57		40-135	0.45	1.042
13C-1,2,3,4,7,8,9-HpCDF	2000	1225.949	61		40-135	0.45	1.079
37Cl-2,3,7,8-TCDD	800	541.209	68		40-135	NA	1.022



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May 18, 2018

Sharon Pennington
Aptim Environmental & Infrastructure, Inc.
2500 City West Blvd., Suite 1700
Houston, TX 77042

Work Order: **HS18050515**

Laboratory Results for: **Longhorn Army Ammunition Plant /LHAAP-17**

Dear Sharon,

ALS Environmental received 2 sample(s) on May 10, 2018 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

RJ Modashia
Project Manager

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
Work Order: HS18050515

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS18050515-01	17WW20-180508	Groundwater		08-May-2018 12:55	10-May-2018 11:28	☐
HS18050515-02	17TB01-180508	Water	ALS 041918-22	08-May-2018 08:00	10-May-2018 11:28	☐

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
Work Order:

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Volatiles by Method SW8260**Batch ID: R316203**

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R316069**Sample ID: HS18050471-01MS**

- MS and MSD are for an unrelated sample
-

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant /LHAAP-17
 Sample ID: 17WW20-180508
 Collection Date: 08-May-2018 12:55

ANALYTICAL REPORT

WorkOrder:HS18050515
 Lab ID:HS18050515-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	11-May-2018 17:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	11-May-2018 17:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	11-May-2018 17:36
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	11-May-2018 17:36
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	11-May-2018 17:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 17:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant /LHAAP-17
 Sample ID: 17WW20-180508
 Collection Date: 08-May-2018 12:55

ANALYTICAL REPORT

WorkOrder:HS18050515
 Lab ID:HS18050515-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	11-May-2018 17:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	11-May-2018 17:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	11-May-2018 17:36
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	11-May-2018 17:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 17:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
Trichloroethene	1.6		0.20	0.50	1.0	ug/L	1	15-May-2018 13:24
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 17:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 17:36
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>101</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>11-May-2018 17:36</i>
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>103</i>			0	<i>70-126</i>	%REC	<i>1</i>	<i>15-May-2018 13:24</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>11-May-2018 17:36</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>81-113</i>	%REC	<i>1</i>	<i>15-May-2018 13:24</i>
<i>Surr: Dibromofluoromethane</i>	<i>106</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>11-May-2018 17:36</i>
<i>Surr: Dibromofluoromethane</i>	<i>108</i>			0	<i>77-123</i>	%REC	<i>1</i>	<i>15-May-2018 13:24</i>
<i>Surr: Toluene-d8</i>	<i>106</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>11-May-2018 17:36</i>
<i>Surr: Toluene-d8</i>	<i>110</i>			0	<i>82-127</i>	%REC	<i>1</i>	<i>15-May-2018 13:24</i>
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: JML
Subcontract Analysis	See Attached		0	0		NA	1	18-May-2018 14:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant /LHAAP-17
 Sample ID: 17TB01-180508
 Collection Date: 08-May-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18050515
 Lab ID:HS18050515-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2-Dibromo-3-chloropropane	0.50	U	1.0	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
2-Butanone	1.0	U	0.50	1.0	2.0	ug/L	1	11-May-2018 12:42
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
2-Hexanone	1.0	U	1.0	1.0	2.0	ug/L	1	11-May-2018 12:42
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	ug/L	1	11-May-2018 12:42
Acetone	1.0	U	2.0	1.0	2.0	ug/L	1	11-May-2018 12:42
Benzene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Bromobenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Bromoform	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
Bromomethane	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
Carbon disulfide	1.0	U	0.60	1.0	2.0	ug/L	1	11-May-2018 12:42
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	ug/L	1	11-May-2018 12:42
Chlorobenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
 Project: Longhorn Army Ammunition Plant /LHAAP-17
 Sample ID: 17TB01-180508
 Collection Date: 08-May-2018 08:00

ANALYTICAL REPORT

WorkOrder:HS18050515
 Lab ID:HS18050515-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		Method:SW8260						Analyst: AKP
Chloroethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Chloroform	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Chloromethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	ug/L	1	11-May-2018 12:42
Dibromochloromethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Dibromomethane	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Ethylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	ug/L	1	11-May-2018 12:42
Isopropylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	ug/L	1	11-May-2018 12:42
Methylene chloride	1.0	U	1.0	1.0	2.0	ug/L	1	11-May-2018 12:42
n-Butylbenzene	0.50	U	0.40	0.50	1.0	ug/L	1	11-May-2018 12:42
n-Propylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Naphthalene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
o-Xylene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Styrene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Tetrachloroethene	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Toluene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Trichloroethene	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	ug/L	1	11-May-2018 12:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	ug/L	1	11-May-2018 12:42
Surr: 1,2-Dichloroethane-d4	100			0	70-126	%REC	1	11-May-2018 12:42
Surr: 4-Bromofluorobenzene	102			0	81-113	%REC	1	11-May-2018 12:42
Surr: Dibromofluoromethane	104			0	77-123	%REC	1	11-May-2018 12:42
Surr: Toluene-d8	107			0	82-127	%REC	1	11-May-2018 12:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R316069	Test Name : LOW LEVEL VOLATILES BY SW8260C		Matrix: Water			
HS18050515-02	17TB01-180508	08 May 2018 08:00			11 May 2018 12:42	1
Batch ID R316069	Test Name : LOW LEVEL VOLATILES BY SW8260C		Matrix: Groundwater			
HS18050515-01	17WW20-180508	08 May 2018 12:55			11 May 2018 17:36	1
Batch ID R316203	Test Name : LOW LEVEL VOLATILES BY SW8260C		Matrix: Groundwater			
HS18050515-01	17WW20-180508	08 May 2018 12:55			15 May 2018 13:24	1
Batch ID R316500	Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Matrix: Groundwater			
HS18050515-01	17WW20-180508	08 May 2018 12:55			18 May 2018 14:32	1

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260						
MBLK	Sample ID: VBLKW-180511	Units: ug/L			Analysis Date: 11-May-2018 11:28					
Client ID:	Run ID: VOA2_316069	SeqNo: 4557797		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	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichlor-1,2,2-trifluoroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW-180511	Units: ug/L		Analysis Date: 11-May-2018 11:28					
Client ID:	Run ID: VOA2_316069	SeqNo: 4557797		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	0.50	1.0							U
Carbon disulfide	1.0	2.0							U
Carbon tetrachloride	0.50	1.0							U
Chlorobenzene	0.50	1.0							U
Chloroethane	0.50	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	0.50	1.0							U
Dibromomethane	0.50	1.0							U
Dichlorodifluoromethane	0.50	1.0							U
Ethylbenzene	0.50	1.0							U
Hexachlorobutadiene	0.50	1.0							U
Isopropylbenzene	0.50	1.0							U
m,p-Xylene	1.0	2.0							U
Methylene chloride	1.0	2.0							U
Naphthalene	0.50	1.0							U
n-Butylbenzene	0.50	1.0							U
n-Propylbenzene	0.50	1.0							U
o-Xylene	0.50	1.0							U
sec-Butylbenzene	0.50	1.0							U
Styrene	0.50	1.0							U
tert-Butylbenzene	0.50	1.0							U
Tetrachloroethene	0.50	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	0.50	1.0							U
Vinyl chloride	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	49.11	1.0	50	0	98.2	70 - 123			
Surr: 4-Bromofluorobenzene	50.94	1.0	50	0	102	82 - 115			
Surr: Dibromofluoromethane	52.45	1.0	50	0	105	73 - 126			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069											Instrument: VOA2			Method: SW8260		
MBLK		Sample ID: VBLKW-180511			Units: ug/L			Analysis Date: 11-May-2018 11:28								
Client ID:		Run ID: VOA2_316069			SeqNo: 4557797			PrepDate:		DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8		52.38	1.0	50	0	105	81 - 120									

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-180511		Units: ug/L		Analysis Date: 11-May-2018 10:32				
Client ID:		Run ID: VOA2_316069		SeqNo: 4557795		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	51.78	1.0	50	0	104	77 - 118				
1,1,1-Trichloroethane	51.59	1.0	50	0	103	70 - 130				
1,1,2,2-Tetrachloroethane	47.45	1.0	50	0	94.9	70 - 120				
1,1,2-Trichlor-1,2,2-trifluoroethane	54.45	1.0	50	0	109	70 - 130				
1,1,2-Trichloroethane	51.34	1.0	50	0	103	77 - 113				
1,1-Dichloroethane	49.68	1.0	50	0	99.4	71 - 122				
1,1-Dichloroethene	53.73	1.0	50	0	107	70 - 130				
1,1-Dichloropropene	45.67	1.0	50	0	91.3	78 - 118				
1,2,3-Trichlorobenzene	50.17	1.0	50	0	100	70 - 130				
1,2,3-Trichloropropane	53.36	1.0	50	0	107	70 - 127				
1,2,4-Trichlorobenzene	51.49	1.0	50	0	103	77 - 126				
1,2,4-Trimethylbenzene	56.29	1.0	50	0	113	73 - 121				
1,2-Dibromo-3-chloropropane	54.54	1.0	50	0	109	70 - 130				
1,2-Dibromoethane	53.05	1.0	50	0	106	76 - 123				
1,2-Dichlorobenzene	48.68	1.0	50	0	97.4	77 - 113				
1,2-Dichloroethane	51.87	1.0	50	0	104	70 - 124				
1,2-Dichloropropane	49.25	1.0	50	0	98.5	72 - 119				
1,3,5-Trimethylbenzene	46.92	1.0	50	0	93.8	75 - 118				
1,3-Dichlorobenzene	47.94	1.0	50	0	95.9	78 - 118				
1,3-Dichloropropane	51.58	1.0	50	0	103	75 - 116				
1,4-Dichlorobenzene	47.01	1.0	50	0	94.0	79 - 113				
2,2-Dichloropropane	52.92	1.0	50	0	106	70 - 130				
2-Butanone	109.8	2.0	100	0	110	70 - 130				
2-Chlorotoluene	54.81	1.0	50	0	110	70 - 128				
2-Hexanone	108.5	2.0	100	0	109	70 - 130				
4-Chlorotoluene	55.68	1.0	50	0	111	74 - 126				
4-Isopropyltoluene	49.53	1.0	50	0	99.1	74 - 126				
4-Methyl-2-pentanone	103.7	2.0	100	0	104	70 - 130				
Acetone	108.8	2.0	100	0	109	70 - 130				
Benzene	48.94	1.0	50	0	97.9	74 - 120				
Bromobenzene	47.79	1.0	50	0	95.6	78 - 113				
Bromochloromethane	53.61	1.0	50	0	107	76 - 124				
Bromodichloromethane	50.49	1.0	50	0	101	74 - 122				
Bromoform	54.25	1.0	50	0	109	73 - 128				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260						
LCS		Sample ID: VLCSW-180511		Units: ug/L		Analysis Date: 11-May-2018 10:32				
Client ID:		Run ID: VOA2_316069		SeqNo: 4557795		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromomethane	44.05	1.0	50	0	88.1	70 - 130				
Carbon disulfide	100.2	2.0	100	0	100	70 - 130				
Carbon tetrachloride	49.07	1.0	50	0	98.1	71 - 125				
Chlorobenzene	48.91	1.0	50	0	97.8	76 - 113				
Chloroethane	55.16	1.0	50	0	110	70 - 130				
Chloroform	49.35	1.0	50	0	98.7	71 - 121				
Chloromethane	55.22	1.0	50	0	110	70 - 129				
cis-1,2-Dichloroethene	50.17	1.0	50	0	100	75 - 122				
cis-1,3-Dichloropropene	54.13	1.0	50	0	108	73 - 127				
Dibromochloromethane	52.93	1.0	50	0	106	77 - 122				
Dibromomethane	54	1.0	50	0	108	78 - 121				
Dichlorodifluoromethane	52.42	1.0	50	0	105	70 - 130				
Ethylbenzene	49.16	1.0	50	0	98.3	77 - 117				
Hexachlorobutadiene	51.5	1.0	50	0	103	70 - 130				
Isopropylbenzene	51.08	1.0	50	0	102	73 - 127				
m,p-Xylene	119.4	2.0	100	0	119	77 - 122				
Methylene chloride	46.85	2.0	50	0	93.7	70 - 127				
Naphthalene	52.58	1.0	50	0	105	70 - 130				
n-Butylbenzene	51.71	1.0	50	0	103	72 - 130				
n-Propylbenzene	47.71	1.0	50	0	95.4	73 - 124				
o-Xylene	50.02	1.0	50	0	100	75 - 119				
sec-Butylbenzene	49.85	1.0	50	0	99.7	73 - 128				
Styrene	51.28	1.0	50	0	103	72 - 126				
tert-Butylbenzene	48.38	1.0	50	0	96.8	73 - 124				
Tetrachloroethene	51.15	1.0	50	0	102	76 - 119				
Toluene	48	1.0	50	0	96.0	77 - 118				
trans-1,2-Dichloroethene	53.67	1.0	50	0	107	72 - 127				
trans-1,3-Dichloropropene	56.31	1.0	50	0	113	77 - 119				
Trichloroethene	53.01	1.0	50	0	106	77 - 121				
Trichlorofluoromethane	54.44	1.0	50	0	109	70 - 130				
Vinyl chloride	51.66	1.0	50	0	103	70 - 130				
Surr: 1,2-Dichloroethane-d4	51.49	1.0	50	0	103	70 - 130				
Surr: 4-Bromofluorobenzene	53.94	1.0	50	0	108	82 - 115				
Surr: Dibromofluoromethane	49.71	1.0	50	0	99.4	73 - 126				

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069											Instrument: VOA2			Method: SW8260		
LCS		Sample ID: VLCSW-180511			Units: ug/L			Analysis Date: 11-May-2018 10:32								
Client ID:		Run ID: VOA2_316069			SeqNo: 4557795		PrepDate:		DF: 1							
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8		51.62	1.0	50	0	103	81 - 120									

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260					
MS		Sample ID: HS18050471-01MS		Units: ug/L		Analysis Date: 11-May-2018 13:31			
Client ID:		Run ID: VOA2_316069		SeqNo: 4557802		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	48.15	1.0	50	0	96.3	70 - 120			
1,1,1-Trichloroethane	50.5	1.0	50	0	101	70 - 130			
1,1,2,2-Tetrachloroethane	44.41	1.0	50	0	88.8	70 - 123			
1,1,2-Trichlor-1,2,2-trifluoroethane	53.79	1.0	50	0	108	70 - 130			
1,1,2-Trichloroethane	48.98	1.0	50	0	98.0	70 - 117			
1,1-Dichloroethane	49.09	1.0	50	0	98.2	70 - 127			
1,1-Dichloroethene	53.68	1.0	50	0	107	70 - 130			
1,1-Dichloropropene	43.99	1.0	50	0	88.0	70 - 129			
1,2,3-Trichlorobenzene	45.54	1.0	50	0	91.1	70 - 130			
1,2,3-Trichloropropane	52.91	1.0	50	0	106	70 - 130			
1,2,4-Trichlorobenzene	45.87	1.0	50	0	91.7	70 - 125			
1,2,4-Trimethylbenzene	52.57	1.0	50	0	105	70 - 125			
1,2-Dibromo-3-chloropropane	51.22	1.0	50	0	102	70 - 130			
1,2-Dibromoethane	49.67	1.0	50	0	99.3	70 - 124			
1,2-Dichlorobenzene	45.51	1.0	50	0	91.0	70 - 115			
1,2-Dichloroethane	50.1	1.0	50	1.623	97.0	70 - 127			
1,2-Dichloropropane	48.08	1.0	50	0	96.2	70 - 122			
1,3,5-Trimethylbenzene	44.31	1.0	50	0	88.6	70 - 126			
1,3-Dichlorobenzene	45.1	1.0	50	0	90.2	70 - 119			
1,3-Dichloropropane	48.02	1.0	50	0	96.0	70 - 121			
1,4-Dichlorobenzene	44.48	1.0	50	0	89.0	70 - 114			
2,2-Dichloropropane	50.86	1.0	50	0	102	70 - 130			
2-Butanone	104.9	2.0	100	0	105	70 - 130			
2-Chlorotoluene	51.92	1.0	50	0	104	70 - 130			
2-Hexanone	104.3	2.0	100	0	104	70 - 130			
4-Chlorotoluene	52.62	1.0	50	0	105	70 - 130			
4-Isopropyltoluene	46.39	1.0	50	0	92.8	70 - 130			
4-Methyl-2-pentanone	98.85	2.0	100	0	98.8	70 - 130			
Acetone	106.1	2.0	100	0	106	70 - 130			
Benzene	47.86	1.0	50	0	95.7	70 - 127			
Bromobenzene	45.3	1.0	50	0	90.6	70 - 115			
Bromochloromethane	50.9	1.0	50	0	102	70 - 127			
Bromodichloromethane	48.5	1.0	50	0	97.0	70 - 124			
Bromoform	50.65	1.0	50	0	101	70 - 129			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260					
MS		Sample ID: HS18050471-01MS		Units: ug/L		Analysis Date: 11-May-2018 13:31			
Client ID:		Run ID: VOA2_316069		SeqNo: 4557802		PrepDate:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	41.5	1.0	50	0	83.0	70 - 130			
Carbon disulfide	100.5	2.0	100	0	100	70 - 130			
Carbon tetrachloride	47.26	1.0	50	0	94.5	70 - 130			
Chlorobenzene	46.65	1.0	50	0	93.3	70 - 114			
Chloroethane	56.21	1.0	50	0	112	70 - 130			
Chloroform	47.76	1.0	50	0	95.5	70 - 125			
Chloromethane	46.59	1.0	50	0	93.2	70 - 130			
cis-1,2-Dichloroethene	66.62	1.0	50	14.9	103	70 - 128			
cis-1,3-Dichloropropene	51.89	1.0	50	0	104	70 - 125			
Dibromochloromethane	49.16	1.0	50	0	98.3	70 - 124			
Dibromomethane	51.44	1.0	50	0	103	70 - 124			
Dichlorodifluoromethane	41.8	1.0	50	0	83.6	70 - 130			
Ethylbenzene	47.47	1.0	50	0	94.9	70 - 124			
Hexachlorobutadiene	45.69	1.0	50	0	91.4	70 - 130			
Isopropylbenzene	49.16	1.0	50	0	98.3	70 - 130			
m,p-Xylene	114.1	2.0	100	0	114	70 - 130			
Methylene chloride	45.28	2.0	50	0	90.6	70 - 128			
Naphthalene	48.41	1.0	50	0	96.8	70 - 130			
n-Butylbenzene	48.23	1.0	50	0	96.5	70 - 130			
n-Propylbenzene	45.66	1.0	50	0	91.3	70 - 130			
o-Xylene	48.54	1.0	50	0	97.1	70 - 124			
sec-Butylbenzene	47.32	1.0	50	0	94.6	70 - 130			
Styrene	44.22	1.0	50	0	88.4	70 - 130			
tert-Butylbenzene	46.38	1.0	50	0	92.8	70 - 130			
Tetrachloroethene	50.02	1.0	50	0	100	70 - 130			
Toluene	46.4	1.0	50	0	92.8	70 - 123			
trans-1,2-Dichloroethene	54	1.0	50	0	108	70 - 130			
trans-1,3-Dichloropropene	53.86	1.0	50	0	108	70 - 121			
Trichloroethene	203.2	1.0	50	132.9	141	70 - 129			SE
Trichlorofluoromethane	53.15	1.0	50	0	106	70 - 130			
Vinyl chloride	49.87	1.0	50	0	99.7	70 - 130			
Surr: 1,2-Dichloroethane-d4	51.59	1.0	50	0	103	70 - 126			
Surr: 4-Bromofluorobenzene	53.81	1.0	50	0	108	81 - 113			
Surr: Dibromofluoromethane	49.81	1.0	50	0	99.6	77 - 123			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069											Instrument: VOA2			Method: SW8260		
MS		Sample ID: HS18050471-01MS				Units: ug/L			Analysis Date: 11-May-2018 13:31							
Client ID:		Run ID: VOA2_316069				SeqNo: 4557802		PrepDate:		DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual						
Surr: Toluene-d8		51.24	1.0	50	0	102	82 - 127									

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260						
MSD		Sample ID: HS18050471-01MSD		Units: ug/L		Analysis Date: 11-May-2018 13:56				
Client ID:		Run ID: VOA2_316069		SeqNo: 4557803		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	48.37	1.0	50	0	96.7	70 - 120	48.15	0.448	20	
1,1,1-Trichloroethane	50.26	1.0	50	0	101	70 - 130	50.5	0.48	20	
1,1,2,2-Tetrachloroethane	44.44	1.0	50	0	88.9	70 - 123	44.41	0.0469	20	
1,1,2-Trichlor-1,2,2-trifluoroethane	52.31	1.0	50	0	105	70 - 130	53.79	2.79	20	
1,1,2-Trichloroethane	48.6	1.0	50	0	97.2	70 - 117	48.98	0.777	20	
1,1-Dichloroethane	48.77	1.0	50	0	97.5	70 - 127	49.09	0.663	20	
1,1-Dichloroethene	53.22	1.0	50	0	106	70 - 130	53.68	0.861	20	
1,1-Dichloropropene	46.02	1.0	50	0	92.0	70 - 129	43.99	4.52	20	
1,2,3-Trichlorobenzene	46.45	1.0	50	0	92.9	70 - 130	45.54	1.97	20	
1,2,3-Trichloropropane	52.41	1.0	50	0	105	70 - 130	52.91	0.95	20	
1,2,4-Trichlorobenzene	47.06	1.0	50	0	94.1	70 - 125	45.87	2.58	20	
1,2,4-Trimethylbenzene	52.56	1.0	50	0	105	70 - 125	52.57	0.0296	20	
1,2-Dibromo-3-chloropropane	52.81	1.0	50	0	106	70 - 130	51.22	3.04	20	
1,2-Dibromoethane	50.13	1.0	50	0	100	70 - 124	49.67	0.923	20	
1,2-Dichlorobenzene	45.29	1.0	50	0	90.6	70 - 115	45.51	0.492	20	
1,2-Dichloroethane	50.34	1.0	50	1.623	97.4	70 - 127	50.1	0.469	20	
1,2-Dichloropropane	47.88	1.0	50	0	95.8	70 - 122	48.08	0.414	20	
1,3,5-Trimethylbenzene	43.81	1.0	50	0	87.6	70 - 126	44.31	1.14	20	
1,3-Dichlorobenzene	44.47	1.0	50	0	88.9	70 - 119	45.1	1.42	20	
1,3-Dichloropropane	48.07	1.0	50	0	96.1	70 - 121	48.02	0.104	20	
1,4-Dichlorobenzene	43.5	1.0	50	0	87.0	70 - 114	44.48	2.23	20	
2,2-Dichloropropane	49.77	1.0	50	0	99.5	70 - 130	50.86	2.16	20	
2-Butanone	105.8	2.0	100	0	106	70 - 130	104.9	0.838	20	
2-Chlorotoluene	51.79	1.0	50	0	104	70 - 130	51.92	0.265	20	
2-Hexanone	106.1	2.0	100	0	106	70 - 130	104.3	1.74	20	
4-Chlorotoluene	51.95	1.0	50	0	104	70 - 130	52.62	1.28	20	
4-Isopropyltoluene	45.83	1.0	50	0	91.7	70 - 130	46.39	1.22	20	
4-Methyl-2-pentanone	101.7	2.0	100	0	102	70 - 130	98.85	2.85	20	
Acetone	108.6	2.0	100	0	109	70 - 130	106.1	2.33	20	
Benzene	47.81	1.0	50	0	95.6	70 - 127	47.86	0.104	20	
Bromobenzene	44.57	1.0	50	0	89.1	70 - 115	45.3	1.61	20	
Bromochloromethane	50	1.0	50	0	100	70 - 127	50.9	1.78	20	
Bromodichloromethane	48.55	1.0	50	0	97.1	70 - 124	48.5	0.102	20	
Bromoform	51.59	1.0	50	0	103	70 - 129	50.65	1.84	20	

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260					
MSD	Sample ID: HS18050471-01MSD	Units: ug/L		Analysis Date: 11-May-2018 13:56					
Client ID:	Run ID: VOA2_316069	SeqNo: 4557803		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Bromomethane	39.97	1.0	50	0	79.9	70 - 130	41.5	3.74	20
Carbon disulfide	99.23	2.0	100	0	99.2	70 - 130	100.5	1.26	20
Carbon tetrachloride	46.27	1.0	50	0	92.5	70 - 130	47.26	2.12	20
Chlorobenzene	46.81	1.0	50	0	93.6	70 - 114	46.65	0.345	20
Chloroethane	52.8	1.0	50	0	106	70 - 130	56.21	6.26	20
Chloroform	47.56	1.0	50	0	95.1	70 - 125	47.76	0.412	20
Chloromethane	46.46	1.0	50	0	92.9	70 - 130	46.59	0.275	20
cis-1,2-Dichloroethene	65.61	1.0	50	14.9	101	70 - 128	66.62	1.53	20
cis-1,3-Dichloropropene	51.44	1.0	50	0	103	70 - 125	51.89	0.864	20
Dibromochloromethane	49.94	1.0	50	0	99.9	70 - 124	49.16	1.57	20
Dibromomethane	51.66	1.0	50	0	103	70 - 124	51.44	0.424	20
Dichlorodifluoromethane	40.39	1.0	50	0	80.8	70 - 130	41.8	3.43	20
Ethylbenzene	47.25	1.0	50	0	94.5	70 - 124	47.47	0.471	20
Hexachlorobutadiene	46.85	1.0	50	0	93.7	70 - 130	45.69	2.51	20
Isopropylbenzene	48.59	1.0	50	0	97.2	70 - 130	49.16	1.17	20
m,p-Xylene	115.2	2.0	100	0	115	70 - 130	114.1	0.986	20
Methylene chloride	44.35	2.0	50	0	88.7	70 - 128	45.28	2.06	20
Naphthalene	49.76	1.0	50	0	99.5	70 - 130	48.41	2.75	20
n-Butylbenzene	48.07	1.0	50	0	96.1	70 - 130	48.23	0.329	20
n-Propylbenzene	44.87	1.0	50	0	89.7	70 - 130	45.66	1.75	20
o-Xylene	48.17	1.0	50	0	96.3	70 - 124	48.54	0.779	20
sec-Butylbenzene	46.23	1.0	50	0	92.5	70 - 130	47.32	2.32	20
Styrene	43.9	1.0	50	0	87.8	70 - 130	44.22	0.727	20
tert-Butylbenzene	45.57	1.0	50	0	91.1	70 - 130	46.38	1.78	20
Tetrachloroethene	49.18	1.0	50	0	98.4	70 - 130	50.02	1.69	20
Toluene	46.24	1.0	50	0	92.5	70 - 123	46.4	0.348	20
trans-1,2-Dichloroethene	53.97	1.0	50	0	108	70 - 130	54	0.0544	20
trans-1,3-Dichloropropene	53.48	1.0	50	0	107	70 - 121	53.86	0.723	20
Trichloroethene	201.9	1.0	50	132.9	138	70 - 129	203.2	0.632	20 SE
Trichlorofluoromethane	51.34	1.0	50	0	103	70 - 130	53.15	3.45	20
Vinyl chloride	49.76	1.0	50	0	99.5	70 - 130	49.87	0.232	20
Surr: 1,2-Dichloroethane-d4	51.3	1.0	50	0	103	70 - 126	51.59	0.56	20
Surr: 4-Bromofluorobenzene	53.17	1.0	50	0	106	81 - 113	53.81	1.2	20
Surr: Dibromofluoromethane	49.27	1.0	50	0	98.5	77 - 123	49.81	1.09	20

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316069		Instrument: VOA2		Method: SW8260	
MSD	Sample ID: HS18050471-01MSD	Units: ug/L		Analysis Date: 11-May-2018 13:56	
Client ID:	Run ID: VOA2_316069	SeqNo: 4557803		PrepDate:	DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value %REC	Control Limit RPD Ref Value %RPD RPD Limit Qual
<i>Surr: Toluene-d8</i>	<i>51.7</i>	<i>1.0</i>	<i>50</i>	<i>0 103</i>	<i>82 - 127 51.24 0.878 20</i>

The following samples were analyzed in this batch: HS18050515-01 HS18050515-02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316203		Instrument: VOA2		Method: SW8260					
MBLK	Sample ID: VBLKW-180515	Units: ug/L		Analysis Date: 15-May-2018 11:21					
Client ID:	Run ID: VOA2_316203	SeqNo: 4560955		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Trichloroethene	0.50	1.0							U
Surr: 1,2-Dichloroethane-d4	50.67	1.0	50	0	101	70 - 123			
Surr: 4-Bromofluorobenzene	49.69	1.0	50	0	99.4	82 - 115			
Surr: Dibromofluoromethane	53.72	1.0	50	0	107	73 - 126			
Surr: Toluene-d8	53.24	1.0	50	0	106	81 - 120			

LCS	Sample ID: VLCSW-180515	Units: ug/L		Analysis Date: 15-May-2018 10:32					
Client ID:	Run ID: VOA2_316203	SeqNo: 4560953		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Trichloroethene	51.34	1.0	50	0	103	77 - 121			
Surr: 1,2-Dichloroethane-d4	51.68	1.0	50	0	103	70 - 130			
Surr: 4-Bromofluorobenzene	52.97	1.0	50	0	106	82 - 115			
Surr: Dibromofluoromethane	49.81	1.0	50	0	99.6	73 - 126			
Surr: Toluene-d8	51.45	1.0	50	0	103	81 - 120			

MS	Sample ID: HS18050515-01MS	Units: ug/L		Analysis Date: 15-May-2018 13:49					
Client ID: 17WW20-180508	Run ID: VOA2_316203	SeqNo: 4560963		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Trichloroethene	54.11	1.0	50	1.625	105	70 - 129			
Surr: 1,2-Dichloroethane-d4	51.61	1.0	50	0	103	70 - 126			
Surr: 4-Bromofluorobenzene	53.06	1.0	50	0	106	81 - 113			
Surr: Dibromofluoromethane	49.04	1.0	50	0	98.1	77 - 123			
Surr: Toluene-d8	51.83	1.0	50	0	104	82 - 127			

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

QC BATCH REPORT

Batch ID: R316203		Instrument: VOA2		Method: SW8260						
MSD		Sample ID: HS18050515-01MSD		Units: ug/L		Analysis Date: 15-May-2018 14:13				
Client ID: 17WW20-180508		Run ID: VOA2_316203		SeqNo: 4561080		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	51.84	1.0	50	1.625	100	70 - 129	54.11	4.28	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>52.53</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>70 - 126</i>	<i>51.61</i>	<i>1.77</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>52.67</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>105</i>	<i>81 - 113</i>	<i>53.06</i>	<i>0.738</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>49.21</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>98.4</i>	<i>77 - 123</i>	<i>49.04</i>	<i>0.347</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>51.23</i>	<i>1.0</i>	<i>50</i>	<i>0</i>	<i>102</i>	<i>82 - 127</i>	<i>51.83</i>	<i>1.16</i>	<i>20</i>	
The following samples were analyzed in this batch: HS18050515-01										

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Group Houston, Corp

Date: 18-May-18

Client: Aptim Environmental & Infrastructure, Inc.
Project: Longhorn Army Ammunition Plant /LHAAP-17
WorkOrder: HS18050515

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919 2016-2018	31-Jul-2018
Oklahoma	2017-088	31-Aug-2018
North Carolina	624-2018	31-Dec-2018
Louisiana	03087 2017-2018	30-Jun-2018
Arkansas	88-0356	27-Mar-2019
Kansas	E-10352 2017-218	31-Jul-2018
Texas	T10470231	30-Apr-2019

Client:	Aptim Environmental & Infrastructure, Inc.	SAMPLE TRACKING
Project:	Longhorn Army Ammunition Plant /LHAAP-17	
Work Order:	HS18050515	

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS18050515-01	17WW20-180508	Login	5/10/2018 1:27:18 PM	JRM	Sub
HS18050515-01	17WW20-180508	Login	5/10/2018 1:27:18 PM	JRM	WET206
HS18050515-01	17WW20-180508	Login	5/10/2018 1:27:18 PM	JRM	WET206
HS18050515-01	17WW20-180508	Login	5/10/2018 1:27:18 PM	JRM	WET206
HS18050515-01	17WW20-180508	Login	5/10/2018 1:27:18 PM	JRM	WET206

Date: 18-May-18

Sample Receipt Checklist

Client Name: CBI-Houston
 Work Order: HS18050515

Date/Time Received: **10-May-2018 11:28**
 Received by: **JRM**

Checklist completed by:	<u>Jared R. Makan</u>	10-May-2018	Reviewed by:	<u>RJ Modashia</u>	10-May-2018
	eSignature	Date		eSignature	Date

Matrices: **Water**Carrier name: **UPS**

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 ☒
Chain of custody present?	Yes ☒	No ☐	
Chain of custody signed when relinquished and received?	Yes ☒	No ☐	
Chain of custody agrees with sample labels?	Yes ☒	No ☐	
Samples in proper container/bottle?	Yes ☒	No ☐	
Sample containers intact?	Yes ☒	No ☐	
TX1005 solids received in hermetically sealed vials?	Yes ☐	No ☐	N/A ☒
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):	0.9c/0.4c UC/C	IR11
--------------------------------	----------------	------

Cooler(s)/Kit(s):	Green
-------------------	-------

Date/Time sample(s) sent to storage:	05/10/2018 15:45
--------------------------------------	------------------

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:	
--------------------	--

ALLEN WILLMORE
713.247.9292
GVT-IRVINE 66V563
420 EXCHANGE
IRVINE CA 92602

25 LBS

1 OF 1

SHIP TO:
RJ MODASHIA
2815752270
ALS LABORATORIES
SUITE 210
10450 STANCLIFF ROAD
HOUSTON TX 77099



TX 774 9-08



UPS NEXT DAY AIR

1

TRACKING #: 1Z 66V 563 01 9301 0017



BILLING: P/P

Charge to Coding: 00701.501032.4701.06042011
Sender's Name: Allen Willmore CS 20.0.42 WNTNVS0 99.0A 04/2018



UPS CampusShip

CUSTODY

SEAC

5/9/19



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1812807; 1813193; 1813195;
1813197; 1813198

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2093 (214684)

General Set Information: There were sixteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Samples 1813197006 and 1813198001-03 were analyzed and reported at 1:10 dilutions. Samples 1813195003/05 were analyzed and reported at 1:100 dilutions. Samples 1813198004/05 were analyzed and reported at 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 600645) was less than 1/2 the CRDL. The recovery for the LCS (600646) was within acceptable parameters.

MS/MSD Analysis: The matrix spike and matrix spike duplicate (MS/MSD) was performed on samples 1813198002/03 (Client ID: HS18050471-01 50WW08-180508). The Matrix Spike and duplicate failed QC acceptance criteria for percent recoveries, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) was within the performance limits.



Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in $\mu\text{g/L}$. Results were calculated in $\mu\text{g/L}$ by the equation $(A) \times (B)$,

where: A = Analyte concentration from the standard curve ($\mu\text{g/L}$)

B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1. Manual Integrations was performed for datafile 02APRD01/02 along with datafiles 14MAYD08/11/23/24.

<u>Thomas Bosch</u>	<u>May 17, 2018</u>
Analyst	Date



00899318

ANALYTICAL REPORT

Report Date: May 17, 2018

RJ Masahisa
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1813193**

Project ID: HS18050515

Purchase Order: HS18050515

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
HS18050515-01 17WW20-180508	1813193001	05/08/18	05/11/18	HS18050515

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: **34-1813193**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: HS18050515-01 17WW20-180508			Sampling Site: HS18050515		Collected: 05/08/2018	
Lab ID: 1813193001			Media: Liquid		Received: 05/11/2018	
Matrix: Water			Sampling Parameter: NA			
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable			Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2093 (HBN: 214684) Analyzed: 05/14/2018 10:47		Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet	
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 05/16/2018 11:54	/S/ Stephen Brose 05/17/2018 12:55

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: als@alt.lab@ALSGlobal.com
Web: www.alssl.com

**ANALYTICAL REPORT****Workorder:** 34-1813193**Client:** ALS Environmental
(Houston)**Project Manager:** Kevin W. Griffiths**General Lab Comments**

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body	Certificate Number	Website
Environmental	PJLA (DoD ELAP)		
	Utah (TNI)		
	Nevada		
	Oklahoma		
	Iowa		

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< This testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.



Quality Control Sample Batch Report

00899321

Analysis Information

Workorder: 1813193**Limits:** Client SOW/Contract Specified**Preparation:** NA**Analysis:** EPA 6850**Basis:** DoD QSM**Batch:** NA**Batch:** ELMS/2093 (HBN: 214684)**Prepared By:** NA**Analyzed By:** Thomas Bosch

Blank

LMB: 600645**Analyzed:** 05/14/2018 10:01**Units:** ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 600646**Analyzed:** 05/14/2018 10:15**Dilution:** 1**Units:** ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	5.09	5.00	102	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1813198001**Analyzed:** 05/14/2018 17:00**Dilution:** 10**Units:** ug/L**MS:** 1813198002**Analyzed:** 05/14/2018 17:42**Dilution:** 10**Units:** ug/L**MSD:** 1813198003**Analyzed:** 05/14/2018 17:28**Dilution:** 10**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	140	202	50	# 129	78.8	123.8	207	# 139	2.47	0.0	20.0

Continuing Calibration Verification

CCV: 600642**Analyzed:** 05/14/2018 09:19**Units:** ug/L**Criteria:** $\pm 15\%$ **CCV:** 600647**Analyzed:** 05/14/2018 12:54**Units:** ug/L**Criteria:** $\pm 15\%$ **CCV:** 600649**Analyzed:** 05/14/2018 16:03**Units:** ug/L**Criteria:** $\pm 15\%$

Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	26.6	25.0	106	25.3	25.0	101	26.6	25.0	106

CCV: 600744**Analyzed:** 05/14/2018 18:39**Units:** ug/L**Criteria:** $\pm 15\%$

Analyte	Result	Target	% Rec.
Perchlorate	26.9	25.0	108

Interference Check Sample

ICSA: 600644**Analyzed:** 05/14/2018 09:47**Units:** ug/L**Criteria:** $\pm 30\%$

Analyte	Result	Target	% Rec.
Perchlorate	1.17	1.00	117



Quality Control Sample Batch Report

00899322

Analysis Information

Workorder: 1813193**Limits:** Client SOW/Contract Specified**Preparation:** NA**Analysis:** EPA 6850**Basis:** DoD QSM**Batch:** NA**Batch:** ELMS/2093 (HBN: 214684)**Prepared By:** NA**Analyzed By:** Thomas Bosch

Limit of Detection Verification

LODV: 600643 Analyzed: 05/14/2018 09:33 Units: ug/L Criteria: $\pm 50\%$				LODV: 600648 Analyzed: 05/14/2018 13:09 Units: ug/L Criteria: $\pm 50\%$			LODV: 600650 Analyzed: 05/14/2018 16:17 Units: ug/L Criteria: $\pm 50\%$		
Analyte	Result	Target	% Rec.	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	0.860	1.00	86.0	0.905	1.00	90.5	1.03	1.00	103

LODV: 600745 Analyzed: 05/14/2018 18:53 Units: ug/L Criteria: $\pm 50\%$			
Analyte	Result	Target	% Rec.
Perchlorate	0.978	1.00	97.8

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 05/16/2018 11:54	/S/ Stephen Brose 05/17/2018 12:55

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit
- - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable



1813193

18/2/193

00899323



18698/#2

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**COC ID: 9101****SUBCONTRACT TO:**

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700**CUSTOMER
INFORMATION:**

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@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: HS18050515
TSR: Sonia West

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS18050515-01 ✓	17WW20-180508	Groundwater	08 May 2018 12:55
SUB_Perch-6850			18 May 2018

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Mancini

Date/Time: 5/10/18 18:00

Received By: [Signature]

Date/Time: 05/11/2018 10:00

Cooler ID(s): _____

Temperature(s): _____

[illegible][illegible]

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>18/2/193*</u>	
Date/Time of Receipt: <u>05/11/2018 11:00</u>		Number of Coolers Received: <u>1</u>	
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>	
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>	
Container Custody Seals: <u>Present/Absent/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>	
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? <u>Yes/No/NA</u>	
pH Check Performed:	Metals Yes/No/NA Cyanide Yes/No/NA Sulfide Yes/No/NA Ammonia Yes/No/NA	Total Phenolics Yes/No/NA TPH - 418.1 Yes/No/NA COD Yes/No/NA TKN Yes/No/NA	NO3/NO2 Yes/No/NA Oil & Grease Yes/No/NA Total Phosphorous Yes/No/NA Gross A.B. Gamma Spec Yes/No/NA
Cooler Received	DCL Cooler No.	Temp.	Cooler Received
1	C18 8512	2 °C	4
2	C18	°C	5
3	C18	°C	6
Taken By: <u>W. Schmidt</u> Signature <u>Marianne Schmidt</u> Printed Name <u>05/11/2018</u> Date			

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT		
PROJECT MANAGER COMMENTS:		
ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____ Printed Name Signature		



**Must Deliver Next Business Day
Time and Temperature Sensitive!**

ORIGIN ID:SGRA (281) 590-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 10MAY18
ACTWGT: 27.50 LB
CAD: 300190/CAFE3111
DIMS: 19x16x13 IN

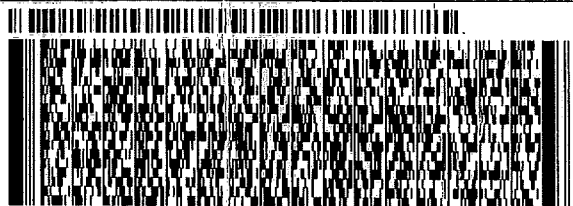
BILL SENDER

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS18050515/521//473/471



**FedEx
Express**



TRK# 4380 9529 0513
0201

**FRI - 11 MAY 3:00P
STANDARD OVERNIGHT**

AX BTFA

84123

UT-US **SLC**





Batch Worklist

Batch: ELMS/ 2093

Created: 5/14/2018 08:56

Instrument:

HBN: 214684

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP



Workorder: 1812807 [ENV_LVL4]

Workorder: 1813193 [ENV_LVL4]

Workorder: 1813195 [ENV_LVL4]

Workorder: 1813197 [ENV_LVL4]

Workorder: 1813198 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	600642	CCV for HBN 214684 [ELMS/2093]				CCV	3		E685041C3Q	5311		5/18/2018	
2	600643	LODV for HBN 214684 [ELMS/2093]				LODV	3		E6850.D3Q	5311		5/18/2018	
3	600644	ICS for HBN 214684 [ELMS/2093]				ICS	3		E6850.D3Q	5311		5/18/2018	
4	600645	LMB for HBN 214684 [ELMS/2093]				LMB	3		E6850Q413Q	5311		5/18/2018	
5	600646	LCS for HBN 214684 [ELMS/2093]				LCS	3		E6850Q413Q	5311		5/18/2018	
6	1812807001	LH18/24-SP650_050318				SAMPLE	3	1812807001-A	E6850Q41.3	5480	5/31/2018	5/18/2018	
7	1813193001	HS18050515-01 17WW20-180508				SAMPLE	3	1813193001-A	E6850Q41.3	5480	6/5/2018	5/24/2018	
8	1813195001	HS18050521-01 50WW22-180509				SAMPLE	3	1813195001-A	E6850Q41.3	5480	6/6/2018	5/24/2018	
9	1813195002	HS18050521-02 50WW16-180509				SAMPLE	3	1813195002-A	E6850Q41.3	5480	6/6/2018	5/24/2018	
10	1813195003	HS18050521-03 50WW11-180509				SAMPLE	3	1813195003-A	E6850Q41.3	5480	6/6/2018	5/24/2018	
11	1813195004	HS18050521-04 50WW14-180509				SAMPLE	3	1813195004-A	E6850Q41.3	5480	6/6/2018	5/24/2018	
12	1813195005	HS18050521-05 50WW13-180509				SAMPLE	3	1813195005-A	E6850Q41.3	5480	6/6/2018	5/24/2018	
13	1813197001	HS18050473-01 50WW27-180507				SAMPLE	3	1813197001-A	E6850Q41.3	5480	6/4/2018	5/24/2018	
14	1813197002	HS18050473-02 50WW15-180507				SAMPLE	3	1813197002-A	E6850Q41.3	5480	6/4/2018	5/24/2018	
15	1813197003	HS18050473-03 50WW18-180507				SAMPLE	3	1813197003-A	E6850Q41.3	5480	6/4/2018	5/24/2018	
16	600647	CCV for HBN 214684 [ELMS/2093]				CCV	3		E685041C3Q	5311		5/18/2018	
17	600648	LODV for HBN 214684 [ELMS/2093]				LODV	3		E6850.D3Q	5311		5/18/2018	
18	1813197004	HS18050473-04 50WW21-180507				SAMPLE	3	1813197004-A	E6850Q41.3	5480	6/4/2018	5/24/2018	
19	1813197005	HS18050473-05 50WW24-180507				SAMPLE	3	1813197005-A	E6850Q41.3	5480	6/4/2018	5/24/2018	
20	1813197006	HS18050473-06 50WW06-180508				SAMPLE	3	1813197006-A	E6850Q41.3	5480	6/5/2018	5/24/2018	
21	1813198001	HS18050471-01 50WW08-180508				SAMPLE	3	1813198001-A	E6850Q41.3	5480	6/5/2018	5/24/2018	
22	1813198002	HS18050471-01 50WW08-180508MS				MS	3	1813198002-A	E6850Q413Q	5480		5/18/2018	
23	1813198003	HS18050471-01 50WW08-180508MSD				MSD	3	1813198003-A	E6850Q413Q	5480		5/18/2018	
24	1813198004	HS18050471-02 50WW12-180508				SAMPLE	3	1813198004-A	E6850Q41.3	5480	6/5/2018	5/24/2018	



Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
25	1813198005	HS18050471-03 50WW12-180508-FD				FLDDUP	3	1813198005-A	E6850Q41.3	5480	6/5/2018	5/24/2018	
26	600649	CCV for HBN 214684 [ELMS/2093]				CCV	3		E685041C3Q	5311		5/18/2018	
27	600650	LODV for HBN 214684 [ELMS/2093]				LODV	3		E6850..D3Q	5311		5/18/2018	
28	600744	CCV for HBN 214684 [ELMS/2093]				CCV	3		E685041C3Q	5311		5/18/2018	
29	600745	LODV for HBN 214684 [ELMS/2093]				LODV	3		E6850..D3Q	5311		5/18/2018	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #()'s: 1812807 (001); 1813193 (001); 1813195 (001-05); 1813197 (001-06); 1813198 (001-05) ELMS Batch/HBN ID: 2093 (214684)

Prep Date: 05/14/2018 Analysis Date: 05/14/2018 Analyst: T. Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2018\APR\1418D.s

Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot DI735)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot DI735)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 41827. Dilutions of Working Standard Solution ID 41829 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 04/02/2018, sequence 02APR18D.s Offline Quantitation Method: CLO4-DPR.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-DOD.M Fragmentor: 160 Output Gain: 3 Injection Volume: 25µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.80
4.0	0.80
5.0	0.25
10.0	0.25
10.5	0.80
13.0	0.80

QC DATA: 5.0µL of QC Solution Horizon ID 41830 was used for LCS 600646; Target = 5.0µg/L. ASTM type II water was used for LMB 600645.

MS/MSD: MS/MSD was performed on samples 1813198002/03 (Client ID: HS18050471-01 50WW08-180508). 5.0µL of Working Standard Solution Horizon ID 41828 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L. The parent sample and the MS/MSD were analyzed at 1:10 dilutions. The effective spike target was 50.µg/L.

COMMENTS:

- 1) Results reported in µg/L. Samples 1813197006 and 1813198001-03 were analyzed and reported at 1:10 dilutions. Samples 1813195003/05 were analyzed and reported at 1:100 dilutions. Samples 1813198004/05 were analyzed and reported at 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The Matrix Spike and duplicate failed QC acceptance criteria for percent recoveries, biased high. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2018\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations was performed for datafiles 02APRD01/02 along with datafiles 14MAYD08/11/23/24.
- 5) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2018\214684-DOD-ALS-HSTN-LCMS4 or through \\ALSLTWS013\DATAVIEW\HBN#



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L			
Standard: 41829		Created By: Thomas Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM	Expires: 10/04/2018		
MFG Lot: TNB: 05/09/2018			Usable: Yes		
Pipette ID: Not Provided			Lab Lot: CLO4 WRK		
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41828	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	10/04/2018

**STANDARD REPORT****Constituent****Stock Standard - CLO4 STOCK**

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 36733		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 05/10/2017 11:05AM	Expires: 10/04/2018
MFG Lot: 216095148			Usable: Yes
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL			
Standard: 41828		Created By: Thomas Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM	Expires: 10/04/2018		
MFG Lot: TNB: 05/09/2018			Usable: Yes		
Pipette ID: Not Provided			Lab Lot: CLO4 INT		
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36733	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	10/04/2018

**STANDARD REPORT****Constituent****Solvent Standard - ASTM H2O**

ASTM H2O			Description - ASTM Type II Water
Standard: 109			Amount: 1000 L
MFG: DCL In House			Expires: 11/07/2025
MFG Lot: Not Provided			Usable: Yes
Part ID: Not Provided			Lab Lot: LAB 109
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			



STANDARD REPORT

Working Standard - CLO4ISTDWRK

Working Standard

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L	
Standard: 41827		Created By: Thomas Bosch	Amount: 10 mL
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM	Expires: 05/09/2019
MFG Lot: TNB: 05/09/2018		Verified By: Thomas Bosch	Usable: Yes
Pipette ID: Not Provided		Verify Date:	Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
23118	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.1 mL	02/27/2024

**STANDARD REPORT****Constituent****Stock Standard - CLO4ISTDSTK**

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 23118			Created By: Thomas Bosch
MFG: Cambridge Isotope			Amount: 1 mL
MFG Lot: SDDG-013			Create Date: 04/04/2014 03:04PM
Part ID: OLM-7310-S			Expires: 02/27/2024
			Verified By: Thomas Bosch
			Usable: Yes
			Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK			Description - 6850 QC WKG STD 100ug/L		
Standard: 41831		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM		Expires: 05/09/2019	
MFG Lot: TNB: 05/09/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 QC WRK 100.ug/L	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	100 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019



STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 41830		Created By: Thomas Bosch	Amount: 10 mL		
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM	Expires: 05/09/2019		
MFG Lot: TNB: 05/09/2018			Usable: Yes		
Pipette ID: Not Provided			Lab Lot: CLO4 QC INT 10.ug/mL		
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020



STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109			Amount: 1000 L
MFG: DCL In House			Expires: 11/07/2025
MFG Lot: Not Provided			Usable: Yes
Part ID: Not Provided			Lab Lot: LAB 109
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

**STANDARD REPORT****Constituent****Stock Standard - CLO4 QCSTOCK**

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL	
Standard: 36748		Created By: Thomas Bosch	Amount: 100 mL
MFG: Ultra Scientific		Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020
MFG Lot: CP-0860		Usable: Yes	
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:

Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCCL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:

The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:

This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:

Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.





Certificate of Analysis



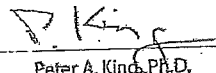
ISO Guide 34 Reference Material

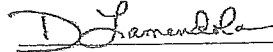
Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:

The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.


Peter A. King, Ph.D.
VP, Technical Operations


Daniel J. Lamendola
Director of QA/RA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®, Inc.

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 216095148
Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Oct 4, 2016
Expiration: Oct 4, 2018
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient ($>5^\circ\text{C}$)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO Guide 34 Scope of Accreditation: Yes



Signal Word: Warning

Component	SRM #	Prepared Concentration ($\mu\text{g/mL}$)
ClO_4 Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.2\%$. See reverse side for details.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a $0.2\ \mu\text{m}$ filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be $\pm 0.5\%$ of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: 
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:

ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP



23118

Product Name:
(Isotopic Label & Enrichment Specification)PERCHLORIC ACID, SODIUM SALT
(18O4, 90%+) 100 UG/ML IN WATER

Lot Number:

SDDG-013

Catalog Number:

OLM-7310-S

Product Information

Chemical Purity Specification:

≥ 98%

Labeled CAS Number:

NA

Unlabeled CAS Number:

7601-89-0

MW*:

130.4

Chemical Formula:

NaCl*O4

Storage:

Store at room temperature away from light and moisture.

Stability:

See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* For isotopically labeled compounds, MW listed is for the fully enriched product.

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\14MAY18D\14MAY18D.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.M

['#' ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount
---	-----	-----	---	-----	---	-----	-----	-----
*	600642	CCV@25	Vial 71	1	Control	1	9.69810e5	26.56688
*	600643	LODV@1.	Vial 72	1	Control	2	3.98185e4	8.60168e-1
*	600644	ICS@1.0	Vial 73	1	Control	3	3.51587e4	1.17141
*	600645	LMB	Vial 74	1	Control	4	0.00000	0.00000
*	600646	QC@5	Vial 75	1	Control	5	1.71173e5	5.09426
*	1812807001		Vial 76	1	Sample	6	1.04601e5	4.86615
*	1813193001		Vial 77	1	Sample	7	0.00000	0.00000
*	1813195001		Vial 78	1	Sample	8	2.51884e4	1.09271
*	1813195002		Vial 79	1	Sample	9	0.00000	0.00000
*	1813195003	1K	Vial 80	1	Sample	10	5.18920e4	1680.70523RE
*	1813195004		Vial 81	1	Sample	11	1.86212e4	7.47600e-1RE
*	1813195005	1K	Vial 82	1	Sample	12	3.05786e4	987.33368RE
*	1813197001		Vial 83	1	Sample	13	0.00000	0.00000
*	1813197002		Vial 84	1	Sample	14	0.00000	0.00000
*	1813197003		Vial 85	1	Sample	15	0.00000	0.00000
*	600647	CCV@25	Vial 71	1	Control	16	8.26446e5	25.34577
*	600648	LODV@1.	Vial 72	1	Control	17	3.91964e4	9.04634e-1
*	1813197004		Vial 86	1	Sample	18	0.00000	0.00000
*	1813197005		Vial 87	1	Sample	19	0.00000	0.00000
*	1813197006	10K	Vial 88	1	Sample	20	0.00000	0.00000RE
*	1813198001		Vial 89	1	Sample	21	4.14783e6	110.26539RE
*	1813198004		Vial 92	1	Sample	23	0.00000	0.00000
*	1813198005		Vial 93	1	Sample	24	0.00000	0.00000
*	Rinse		Vial 61	1	Sample	25	0.00000	0.00000
*	1813197006		Vial 94	1	Sample	26	6.08897e6	142.36301RE
*	1813195003	100	Vial 95	1	Sample	27	2.63388e5	998.60641✓
*	1813195005	100	Vial 96	1	Sample	28	1.65623e5	638.28016✓
*	600649	CCV@25	Vial 71	1	Control	29	8.06835e5	26.58202
*	600650	LODV@1.	Vial 72	1	Control	30	4.05349e4	1.03417
*	1813198004	1K	Vial 62	1	Sample	31	2.88012e6	7.78073e4RE
*	1813198005	1K	Vial 63	1	Sample	32	2.79897e6	7.71644e4RE
*	1813198001	10X	Vial 97	1	Sample	33	4.00251e5	137.61891✓
*	1813198003	MSD	Vial 99	1	Sample	35	6.27182e5	206.92228✓
*	1813198002	MS	Vial 98	1	Sample	36	6.04798e5	201.87431✓
*	1813197006	10X	Vial 64	1	Sample	37	6.92197e5	217.23299✓
*	1813198004	10K	Vial 65	1	Sample	38	2.75522e5	9.13592e4✓
*	1813198005	10K	Vial 66	1	Sample	39	2.62391e5	8.89863e4✓
*	600744	CCV@25	Vial 71	1	Control	40	9.02531e5	26.91539✓
*	600745	LODV@1.	Vial 72	1	Control	41	4.18226e4	9.77695e-1

# *	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
---	-----	-----	---	-----	---	-----	-----	-----	
*	600642	CCV@25	Vial 71	1	Control	1	3.14656e5	8.891	27.64363
*	600643	LODV@1.	Vial 72	1	Control	2	1.50133e4	8.934	8.99204e-1
*	600644	ICS@1.0	Vial 73	1	Control	3	1.35248e4	8.715	1.29534
*	600645	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	600646	QC@5	Vial 75	1	Control	5	5.90434e4	8.799	5.40306
*	1812807001		Vial 76	1	Sample	6	3.59954e4	9.745	5.14225
*	1813193001		Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1813195001		Vial 78	1	Sample	8	8533.53711	8.482	1.03812
*	1813195002		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1813195003	1K	Vial 80	1	Sample	10	1.95045e4	9.029	1861.44495
*	1813195004		Vial 81	1	Sample	11	7184.97070	8.564	7.88158e-1
*	1813195005	1K	Vial 82	1	Sample	12	1.19770e4	9.011	1096.24938
*	1813197001		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1813197002		Vial 84	1	Sample	14	0.00000	0.000	0.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
---	-----	-----	---	-----	---	-----	-----	-----	
*	1813197003	Vial	85	1	Sample	15	0.00000	0.00000	
*	600647	CCV@25	Vial	71	1	Control	16	2.71043e5	26.59613
*	600648	LODV@1.	Vial	72	1	Control	17	1.40026e4	8.93095e-1
*	1813197004	Vial	86	1	Sample	18	0.00000	0.00000	
*	1813197005	Vial	87	1	Sample	19	0.00000	0.00000	
*	1813197006	10K	Vial	88	1	Sample	20	0.00000	0.00000
*	1813198001	Vial	89	1	Sample	21	1.36703e6	121.58405	
*	1813198004	Vial	92	1	Sample	23	0.00000	0.00000	
*	1813198005	Vial	93	1	Sample	24	0.00000	0.00000	
*	Rinse	Vial	61	1	Sample	25	0.00000	0.00000	
*	1813197006	Vial	94	1	Sample	26	2.05634e6	160.95044	
*	1813195003	100	Vial	95	1	Sample	27	8.70362e4	1032.01934
*	1813195005	100	Vial	96	1	Sample	28	5.60779e4	668.45460
*	600649	CCV@25	Vial	71	1	Control	29	2.59768e5	27.46837
*	600650	LODV@1.	Vial	72	1	Control	30	1.50854e4	1.08809
*	1813198004	1K	Vial	62	1	Sample	31	9.37896e5	8.40406e4
*	1813198005	1K	Vial	63	1	Sample	32	9.07245e5	8.30212e4
*	1813198001	10X	Vial	97	1	Sample	33	1.30820e5	141.78254
*	1813198003	MSD	Vial	99	1	Sample	35	2.03448e5	213.82014
*	1813198002	MS	Vial	98	1	Sample	36	1.94864e5	207.16971
*	1813197006	10X	Vial	64	1	Sample	37	2.20928e5	221.43897
*	1813198004	10K	Vial	65	1	Sample	38	9.19742e4	9.51576e4
*	1813198005	10K	Vial	66	1	Sample	39	8.58760e4	9.08587e4
*	600744	CCV@25	Vial	71	1	Control	40	2.84796e5	27.32357
*	600745	LODV@1.	Vial	72	1	Control	41	1.62658e4	1.07567

# *	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount
---	-----	-----	---	-----	---	-----	-----	-----
*	600642	CCV@25	Vial 71	1	Control	1	1.48196e5	5.00000
*	600643	LODV@1.	Vial 72	1	Control	2	2.07465e5	5.00000
*	600644	ICS@1.0	Vial 73	1	Control	3	1.36084e5	5.00000
*	600645	LMB	Vial 74	1	Control	4	1.64232e5	5.00000
*	600646	QC@5	Vial 75	1	Control	5	1.53151e5	5.00000
*	1812807001		Vial 76	1	Sample	6	9.80709e4	5.00000
*	1813193001		Vial 77	1	Sample	7	1.06705e5	5.00000
*	1813195001		Vial 78	1	Sample	8	1.04284e5	5.00000
*	1813195002		Vial 79	1	Sample	9	1.07521e5	5.00000
*	1813195003	1K	Vial 80	1	Sample	10	1.41157e5	5000.00000
*	1813195004		Vial 81	1	Sample	11	1.10863e5	5.00000
*	1813195005	1K	Vial 82	1	Sample	12	1.39603e5	5000.00000
*	1813197001		Vial 83	1	Sample	13	1.19457e5	5.00000
*	1813197002		Vial 84	1	Sample	14	1.16201e5	5.00000
*	1813197003		Vial 85	1	Sample	15	1.20044e5	5.00000
*	600647	CCV@25	Vial 71	1	Control	16	1.33239e5	5.00000
*	600648	LODV@1.	Vial 72	1	Control	17	1.94616e5	5.00000
*	1813197004		Vial 86	1	Sample	18	8.85100e4	5.00000
*	1813197005		Vial 87	1	Sample	19	1.02708e5	5.00000
*	1813197006	10K	Vial 88	1	Sample	20	1.31046e5	5.00000e4
*	1813198001		Vial 89	1	Sample	21	1.05372e5	5.00000
*	1813198004		Vial 92	1	Sample	23	0.00000	0.00000
*	1813198005		Vial 93	1	Sample	24	0.00000	0.00000
*	Rinse		Vial 61	1	Sample	25	0.00000	0.00000
*	1813197006		Vial 94	1	Sample	26	1.07056e5	5.00000
*	1813195003	100	Vial 95	1	Sample	27	1.17249e5	500.00000
*	1813195005	100	Vial 96	1	Sample	28	1.17561e5	500.00000
*	600649	CCV@25	Vial 71	1	Control	29	1.23212e5	5.00000
*	600650	LODV@1.	Vial 72	1	Control	30	1.76981e5	5.00000
*	1813198004	1K	Vial 62	1	Sample	31	1.17884e5	5000.00000
*	1813198005	1K	Vial 63	1	Sample	32	1.15831e5	5000.00000
*	1813198001	10X	Vial 97	1	Sample	33	1.26622e5	50.00000
*	1813198003	MSD	Vial 99	1	Sample	35	1.27010e5	50.00000
*	1813198002	MS	Vial 98	1	Sample	36	1.25887e5	50.00000

Batch Report: C:\HPCHEM\1\DATA\14MAY18D\14MAY18D.B

#	*	Sample Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	1813197006	10X	Vial 64	1	Sample	37	1.32775e5	8.996	50.00000
*	1813198004	10K	Vial 65	1	Sample	38	1.34685e5	9.088	5.00000e4
*	1813198005	10K	Vial 66	1	Sample	39	1.31855e5	9.074	5.00000e4
*	600744	CCV@25	Vial 71	1	Control	40	1.35877e5	9.045	5.00000
*	600745	LODV@1.	Vial 72	1	Control	41	1.92745e5	9.068	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	600642	CCV@25	CLO4-DOD	1	Ctrl Samp	
2	Vial 72	600643	LODV@1.	CLO4-DOD	1	Ctrl Samp	
3	Vial 73	600644	ICS@1.0	CLO4-DOD	1	Ctrl Samp	
4	Vial 74	600645	LMB	CLO4-DOD	1	Ctrl Samp	
5	Vial 75	600646	QC@5	CLO4-DOD	1	Ctrl Samp	
6	Vial 76	1812807001		CLO4-DOD	1	Sample	
7	Vial 77	1813193001		CLO4-DOD	1	Sample	
8	Vial 78	1813195001		CLO4-DOD	1	Sample	
9	Vial 79	1813195002		CLO4-DOD	1	Sample	
10	Vial 80	1813195003	1K	CLO4-DOD	1	Sample	
11	Vial 81	1813195004		CLO4-DOD	1	Sample	
12	Vial 82	1813195005	1K	CLO4-DOD	1	Sample	
13	Vial 83	1813197001		CLO4-DOD	1	Sample	
14	Vial 84	1813197002		CLO4-DOD	1	Sample	
15	Vial 85	1813197003		CLO4-DOD	1	Sample	
16	Vial 71	600647	CCV@25	CLO4-DOD	1	Ctrl Samp	
17	Vial 72	600648	LODV@1.	CLO4-DOD	1	Ctrl Samp	
18	Vial 86	1813197004		CLO4-DOD	1	Sample	
19	Vial 87	1813197005		CLO4-DOD	1	Sample	
20	Vial 88	1813197006	10K	CLO4-DOD	1	Sample	
21	Vial 89	1813198001		CLO4-DOD	1	Sample	
22	Vial 90	1813198002	MS	CLO4-DOD	1	Sample	
23	Vial 92	1813198004		CLO4-DOD	1	Sample	
24	Vial 93	1813198005		CLO4-DOD	1	Sample	
25	Vial 61	Rinse		CLO4-DOD	1	Sample	
26	Vial 94	1813197006		CLO4-DOD	1	Sample	
27	Vial 95	1813195003	100	CLO4-DOD	1	Sample	
28	Vial 96	1813195005	100	CLO4-DOD	1	Sample	
29	Vial 71	600649	CCV@25	CLO4-DOD	1	Ctrl Samp	
30	Vial 72	600650	LODV@1.	CLO4-DOD	1	Ctrl Samp	
31	Vial 62	1813198004	1K	CLO4-DOD	1	Sample	
32	Vial 63	1813198005	1K	CLO4-DOD	1	Sample	
33	Vial 97	1813198001	10X	CLO4-DOD	1	Sample	
34	Vial 98	1813198002	MS	CLO4-DOD	1	Sample	
35	Vial 99	1813198003	MSD	CLO4-DOD	1	Sample	
36	Vial 98	1813198002	MS	CLO4-DOD	1	Sample	
37	Vial 64	1813197006	10X	CLO4-DOD	1	Sample	
38	Vial 65	1813198004	10K	CLO4-DOD	1	Sample	
39	Vial 66	1813198005	10K	CLO4-DOD	1	Sample	
40	Vial 71	600744	CCV@25	CLO4-DOD	1	Ctrl Samp	
41	Vial 72	600745	LODV@1.	CLO4-DOD	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD01.D

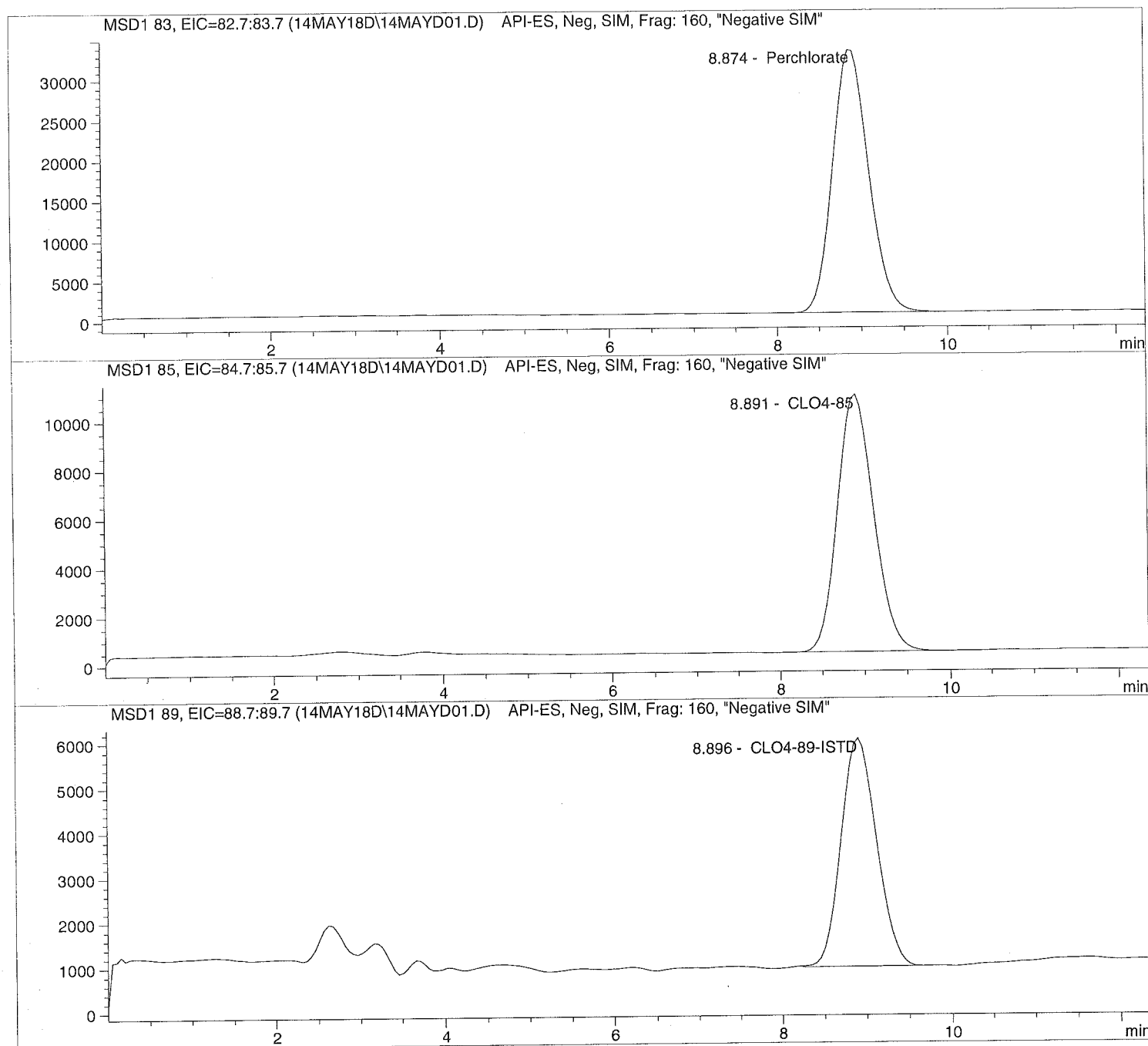
Sample Name: 600642 CCV@25

Injection Date: 5/14/2018 09:19:15
Sample Name: 600642 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD01.D

Sample Name: 600642 CCV@25

Injection Date: 5/14/2018 09:19:15

Seq Line: 1

Sample Name: 600642 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal

Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am

Multiplier: 1.000000

Dilution: 1.000000

Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.874	PBA	969810.0	26.5669	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.891	PBA	314656.3	27.6436	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.896	BBA	148195.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD02.D

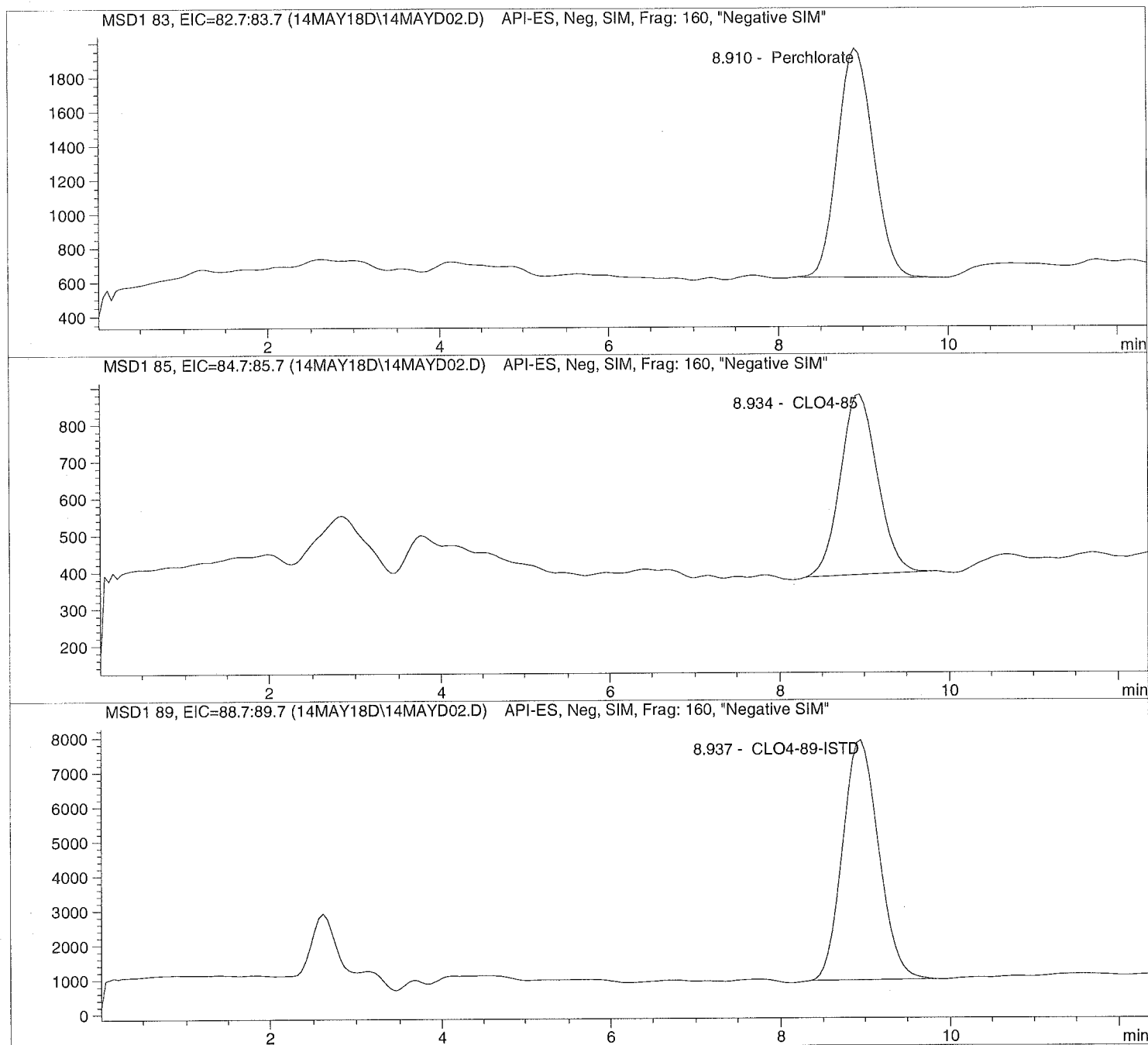
Sample Name: 600643 LODV@1.

Injection Date: 5/14/2018 09:33:22
Sample Name: 600643 LODV@1.
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD02.D

Sample Name: 600643 LODV@1.

```
=====
Injection Date: 5/14/2018 09:33:22      Seq Line: 2
Sample Name: 600643 LODV@1.             Location: Vial 72
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.910	PBA	39818.5	0.8602	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.934	PBA	15013.3	0.8992	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.937	PBA	207464.8	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Injection Date: 5/14/2018 09:47:30

Seq Line: 3

Sample Name: 600644 ICS@1.0

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

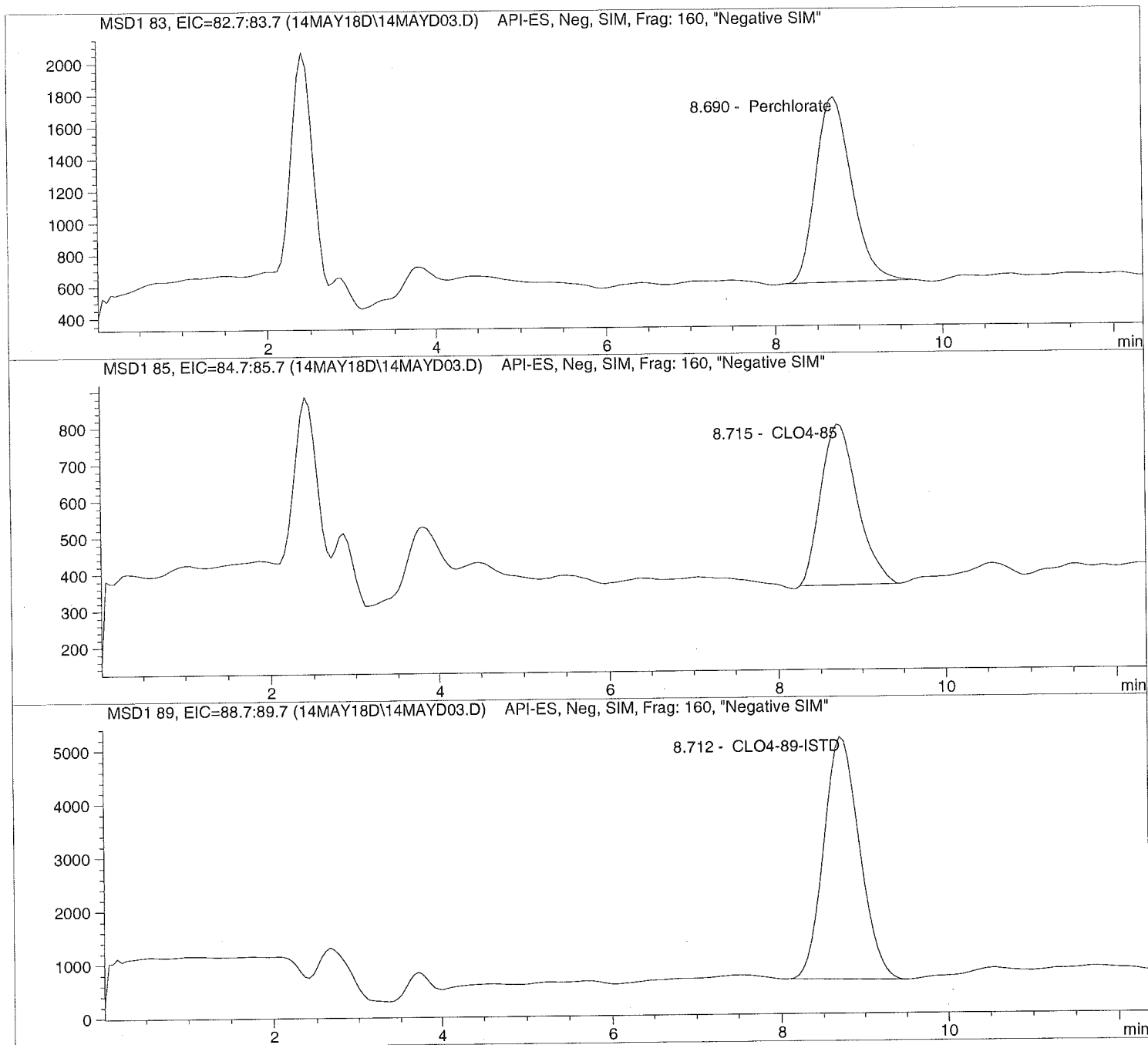
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis




```
=====
Injection Date:  5/14/2018  09:47:30      Seq Line:           3
Sample Name:    600644    ICS@1.0        Location:           Vial 73
Acq Operator:   TNB                      Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.690	PBA	35158.7	1.1714	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.715	PBA	13524.8	1.2953	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.712	PBA	136083.5	5.0000	CLO4-89-ISTD

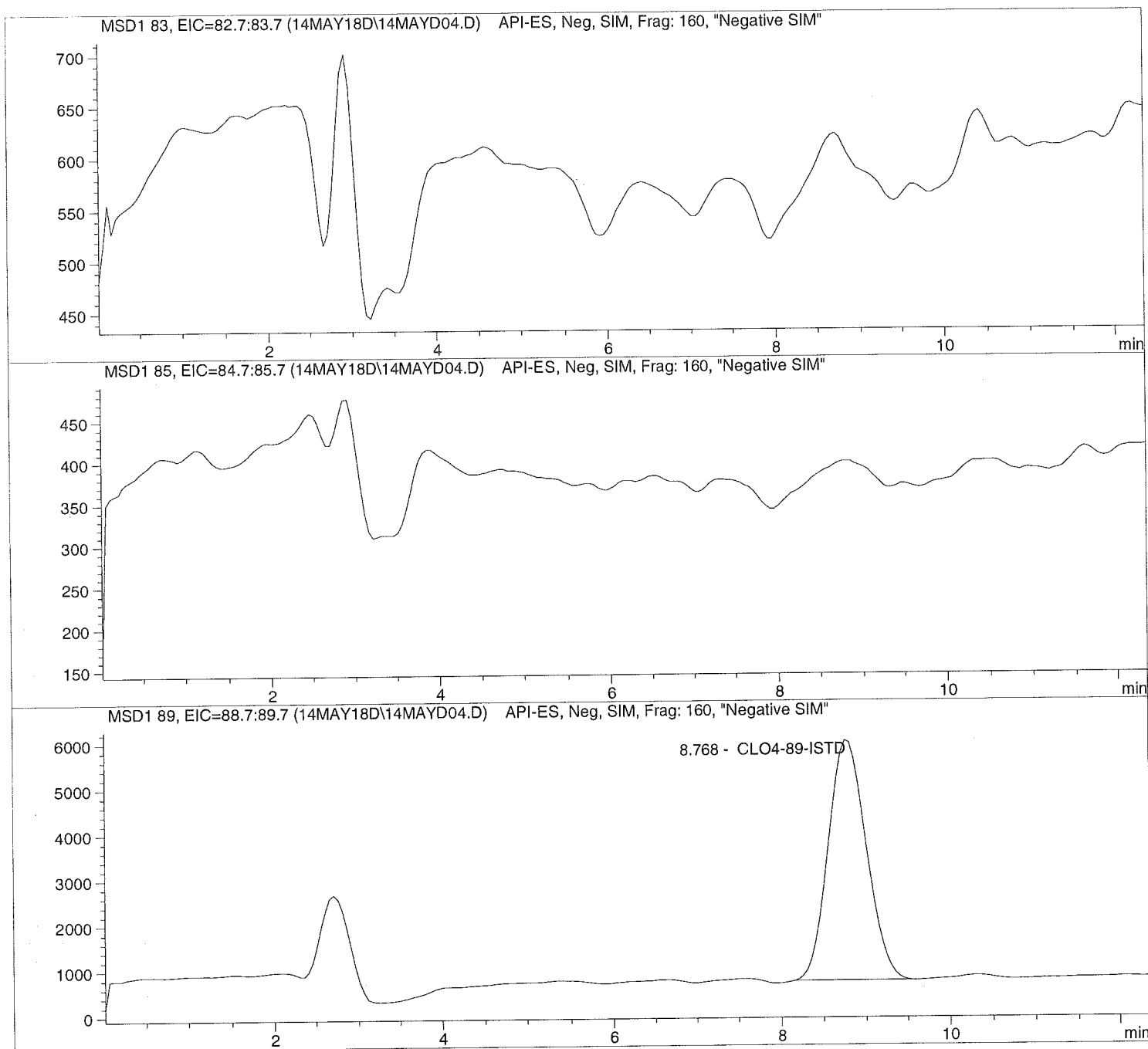
=====
*** End of Report ***
=====

Injection Date: 5/14/2018 10:01:44
Sample Name: 600645 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD04.D

Sample Name: 600645 LMB

```
=====
Injection Date:  5/14/2018  10:01:44      Seq Line:           4
Sample Name:    600645    LMB             Location:          Vial 74
Acq Operator:   TNB                Inj. No.:           1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.768	PBA	164231.9	5.0000	CLO4-89-ISTD

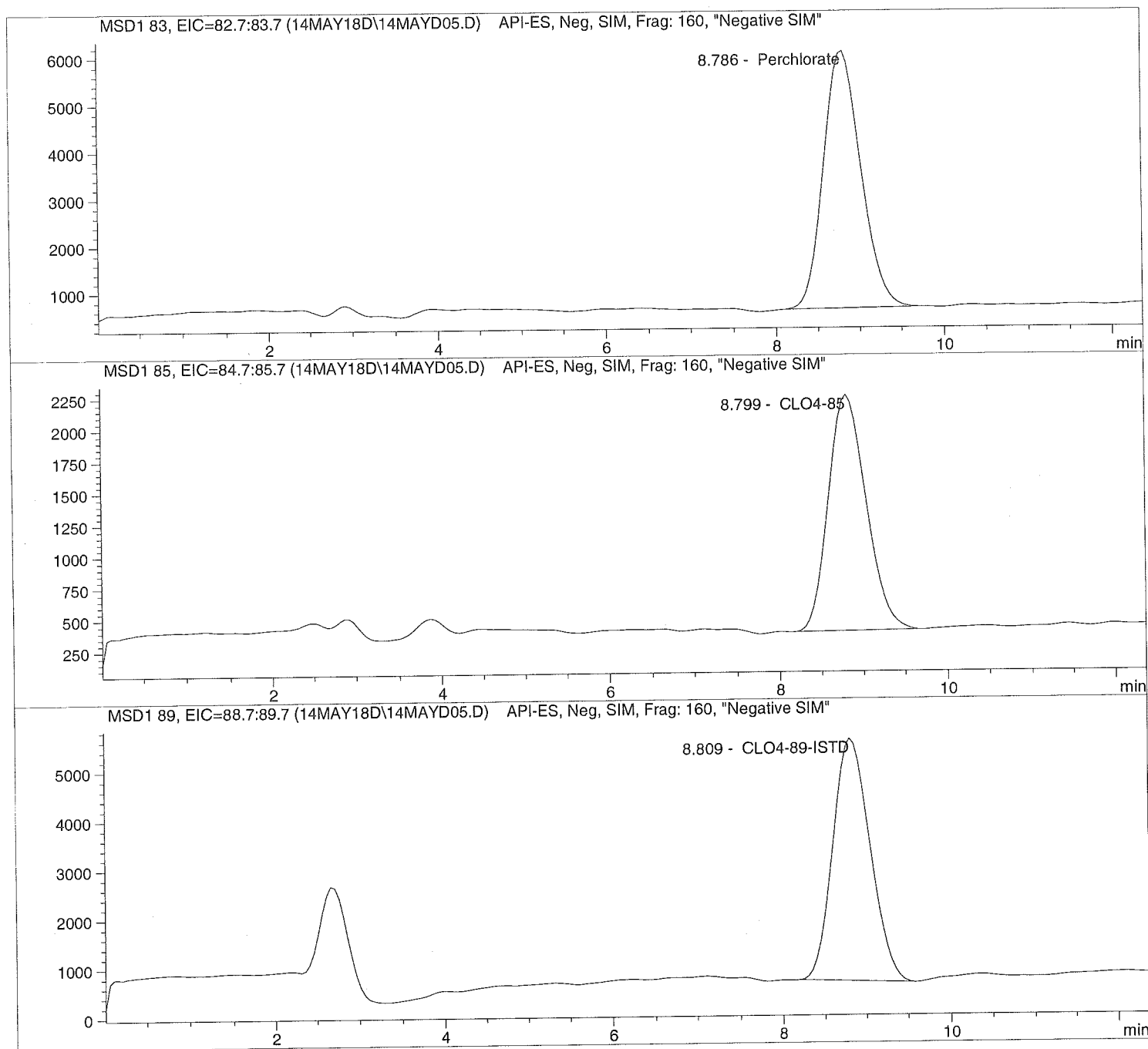
=====
*** End of Report ***
=====

Injection Date: 5/14/2018 10:15:58
Sample Name: 600646 QC@5
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  5/14/2018  10:15:58      Seq Line:           5
Sample Name:    600646   QC05             Location:          Vial 75
Acq Operator:   TNB                               Inj. No.:          1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  5.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.786	BBA	171172.5	5.0943	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.799	PBA	59043.4	5.4031	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.809	PBA	153151.0	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD06.D

Sample Name: 1812807001

Injection Date: 5/14/2018 10:33:01

Seq Line: 6

Sample Name: 1812807001

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

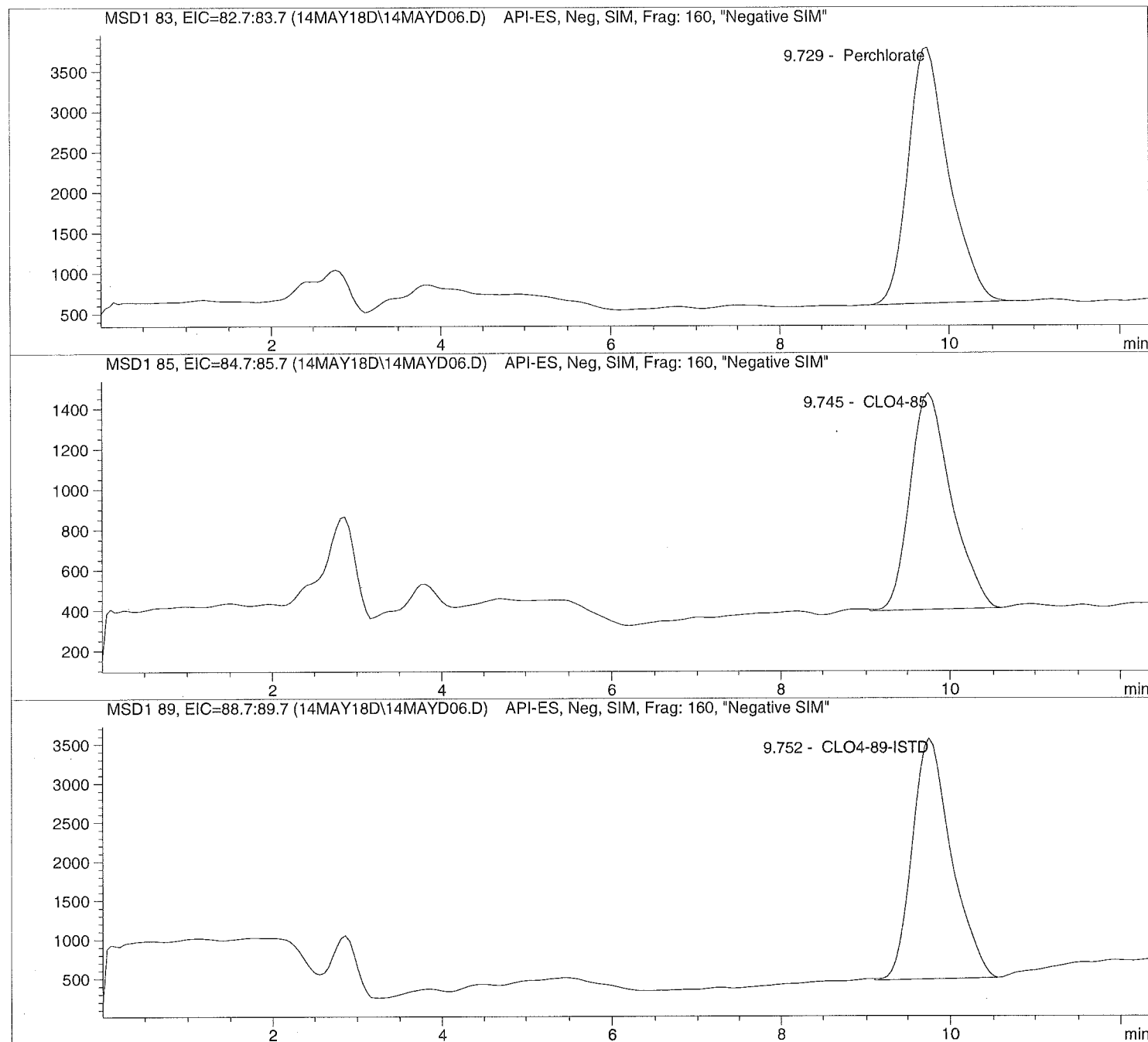
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD06.D

Sample Name: 1812807001

```
=====
Injection Date:  5/14/2018  10:33:01      Seq Line:           6
Sample Name:    1812807001      Location:          Vial 76
Acq Operator:   TNB             Inj. No.:           1
                                   Inj. Vol.:          25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.729	PBA	104601.0	4.8662	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.745	BBA	35995.4	5.1423	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.752	BBA	98070.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD07.D

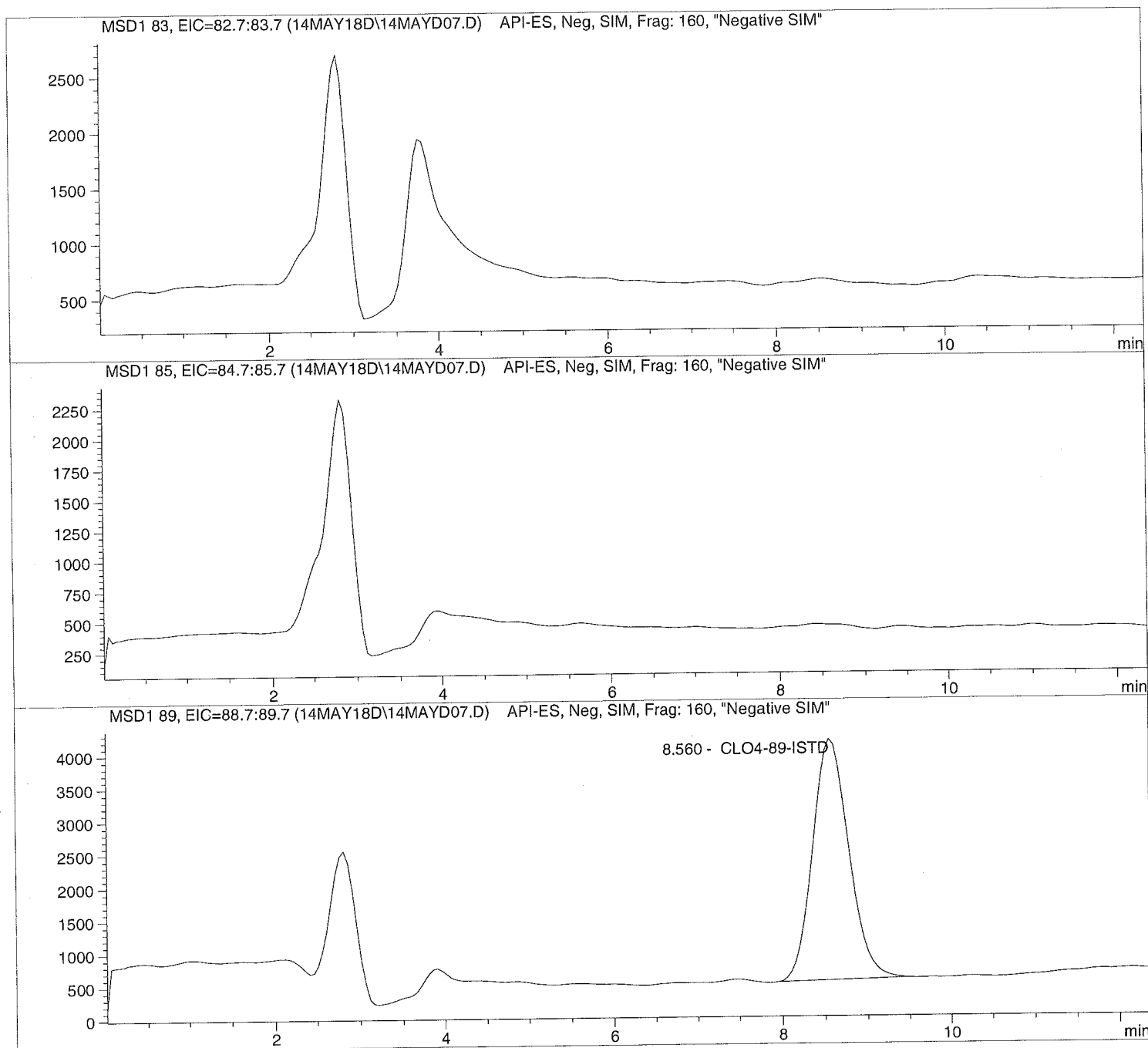
Sample Name: 1813193001

Injection Date: 5/14/2018 10:47:12
Sample Name: 1813193001
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD07.D

Sample Name: 1813193001

```
=====
Injection Date:  5/14/2018  10:47:12      Seq Line:           7
Sample Name:    1813193001      Location:           Vial 77
Acq Operator:   TNB             Inj. No.:           1
                                      Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.560	PBA	106704.8	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD08.D

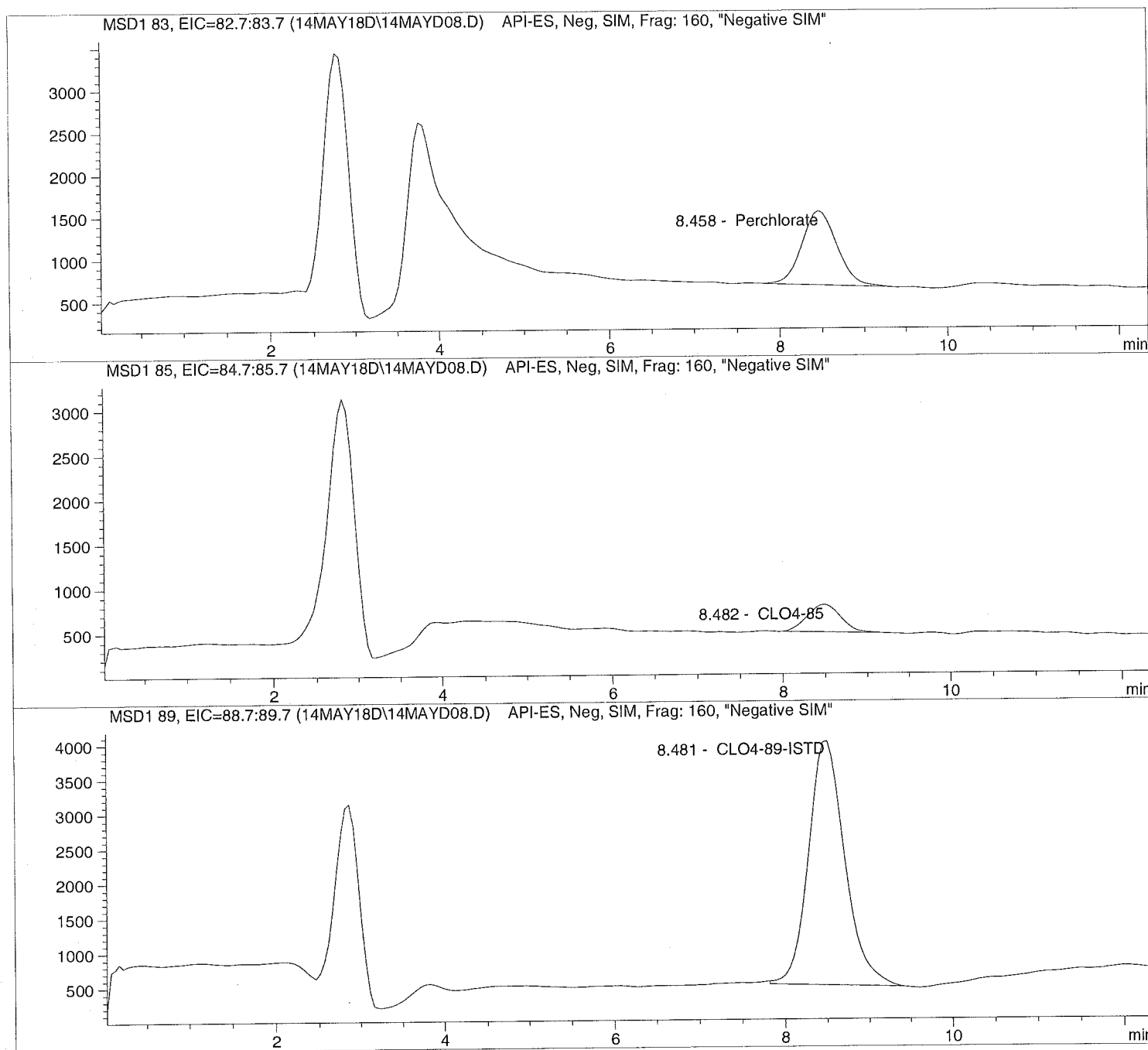
Sample Name: 1813195001

Injection Date: 5/14/2018 11:01:22
Sample Name: 1813195001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD08.D

Sample Name: 1813195001

```
=====
Injection Date:  5/14/2018  11:01:22      Seq Line:      8
Sample Name:    1813195001                Location:      Vial 78
Acq Operator:   TNB                       Inj. No.:      1
                                           Inj. Vol.:    25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018  11:32:43
=====
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
=====
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.458	BBA	25188.4	1.0927	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.482	MM	8533.5	1.0381	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.481	BBA	104283.8	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD09.D

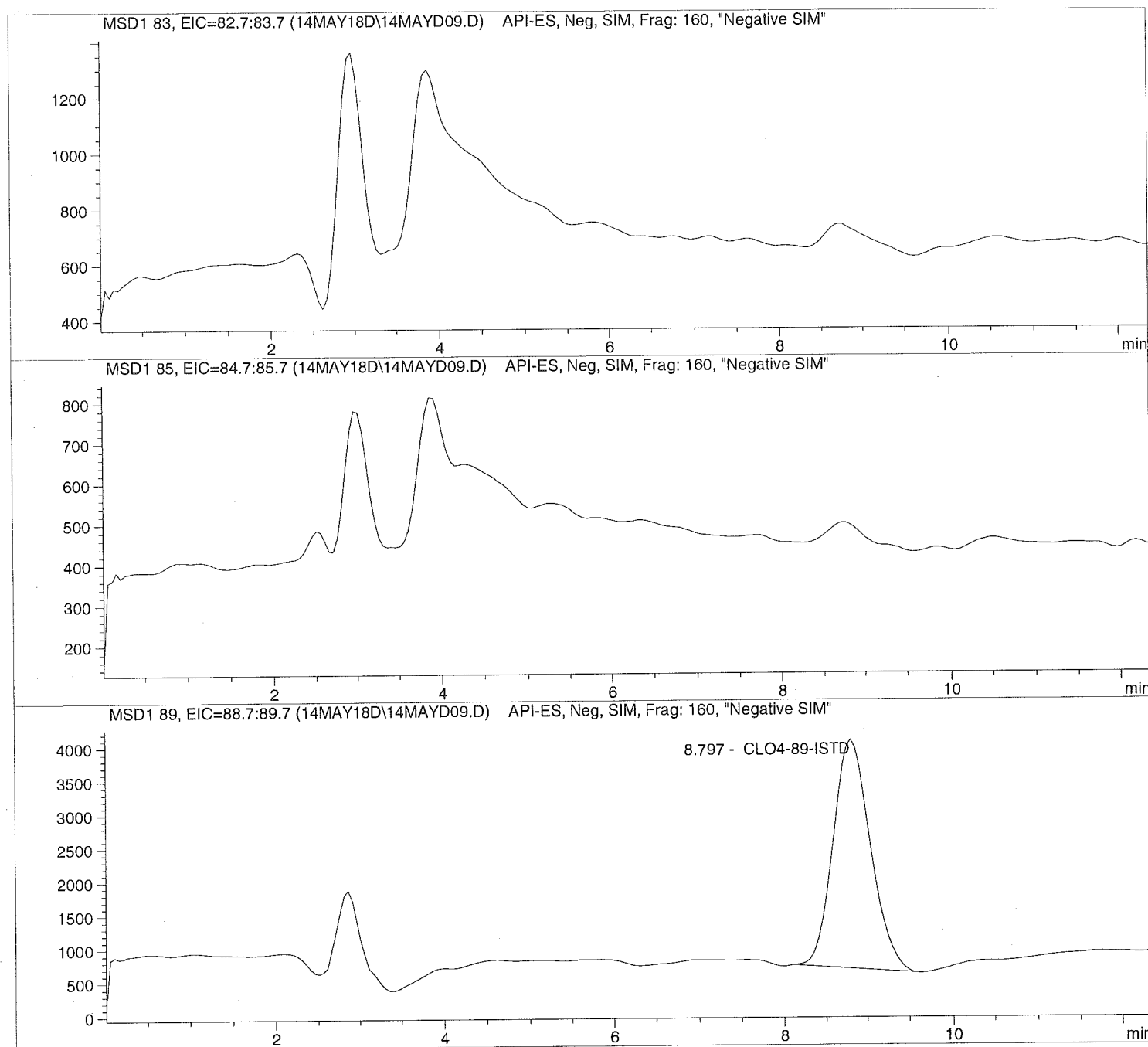
Sample Name: 1813195002

Injection Date: 5/14/2018 11:15:33
Sample Name: 1813195002
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD09.D

Sample Name: 1813195002

```
=====
Injection Date:  5/14/2018  11:15:33      Seq Line:          9
Sample Name:    1813195002                Location:         Vial 79
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.797	PBA	107520.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD10.D

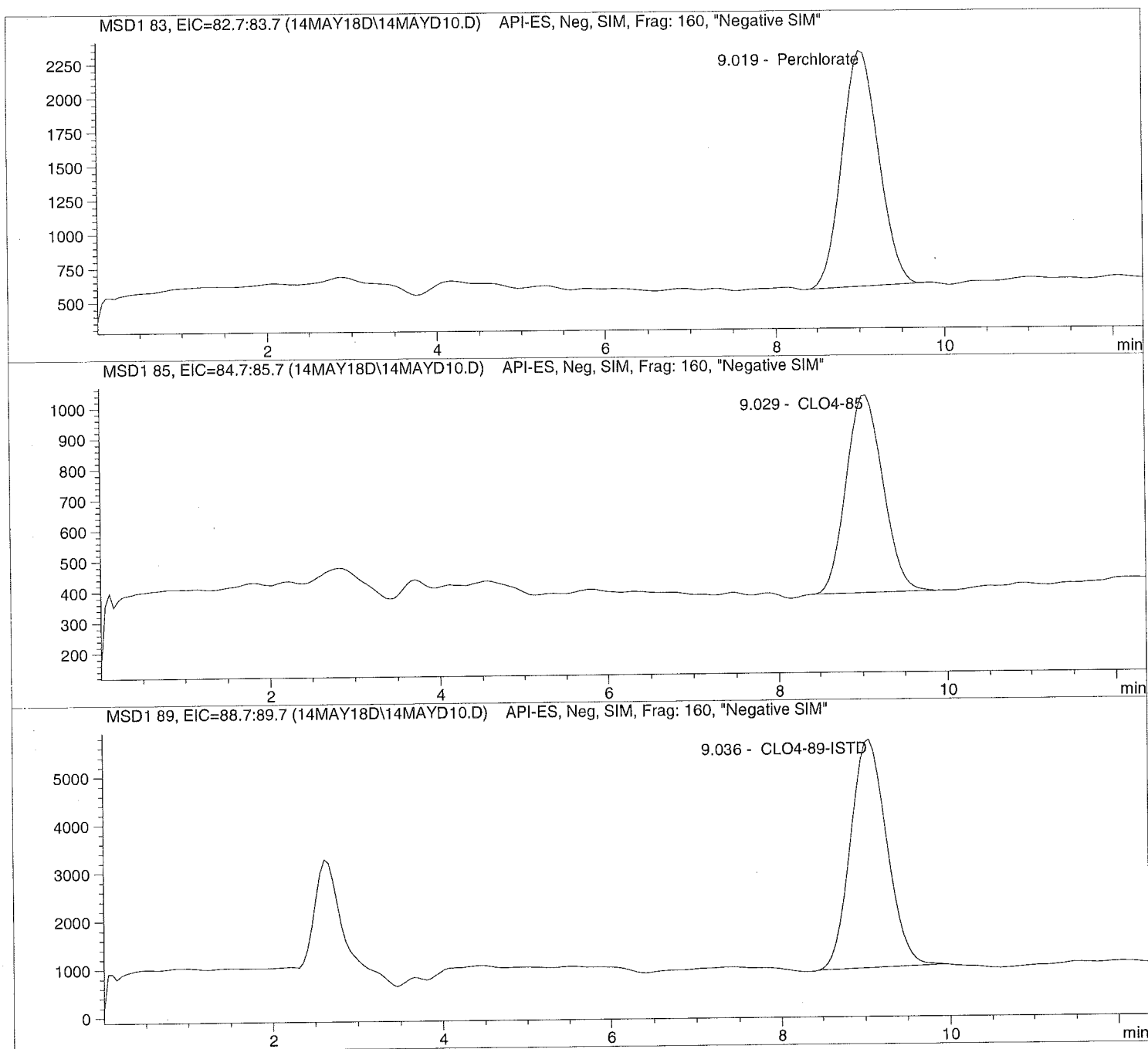
Sample Name: 1813195003 1K

Injection Date: 5/14/2018 11:29:47
Sample Name: 1813195003 1K
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD10.D Sample Name: 1813195003 1K

Injection Date: 5/14/2018 11:29:47 Seq Line: 10
Sample Name: 1813195003 1K Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1000.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.019	PBA	51892.0	1680.7052	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.029	PBA	19504.5	1861.4449	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.036	PBA	141157.3	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD11.D

Sample Name: 1813195004

Injection Date: 5/14/2018 11:43:58

Seq Line: 11

Sample Name: 1813195004

Location: Vial 81

Acq Operator: TNB

Inj. No.: 1

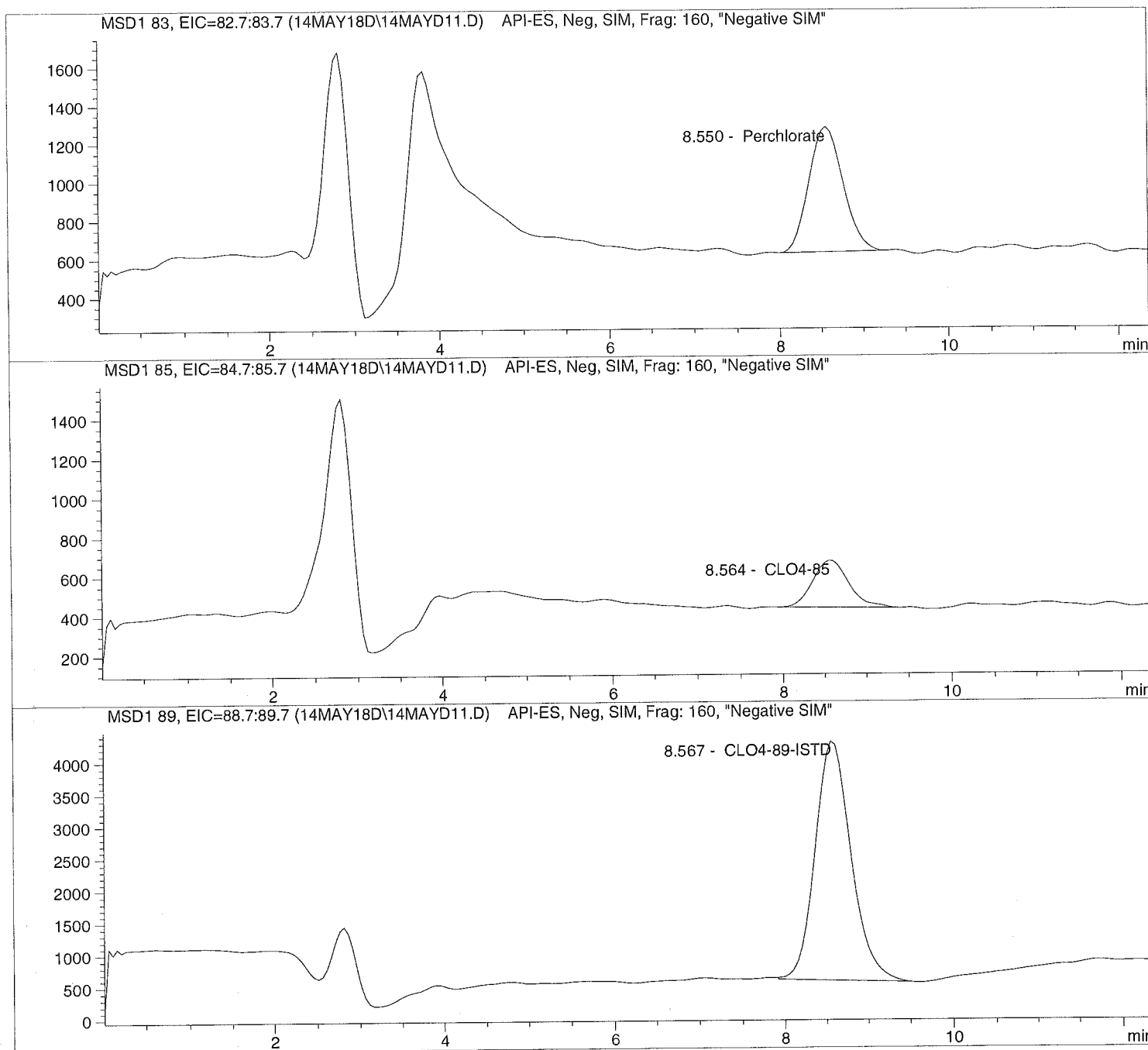
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD11.D

Sample Name: 1813195004

```
=====
Injection Date:  5/14/2018  11:43:58      Seq Line:          11
Sample Name:    1813195004      Location:         Vial 81
Acq Operator:   TNB             Inj. No.:         1
                                   Inj. Vol.:        25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.550	PBA	18621.2	0.7476	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.564	MM	7185.0	0.7882	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.567	BBA	110863.1	5.0000	CLO4-89-ISTD

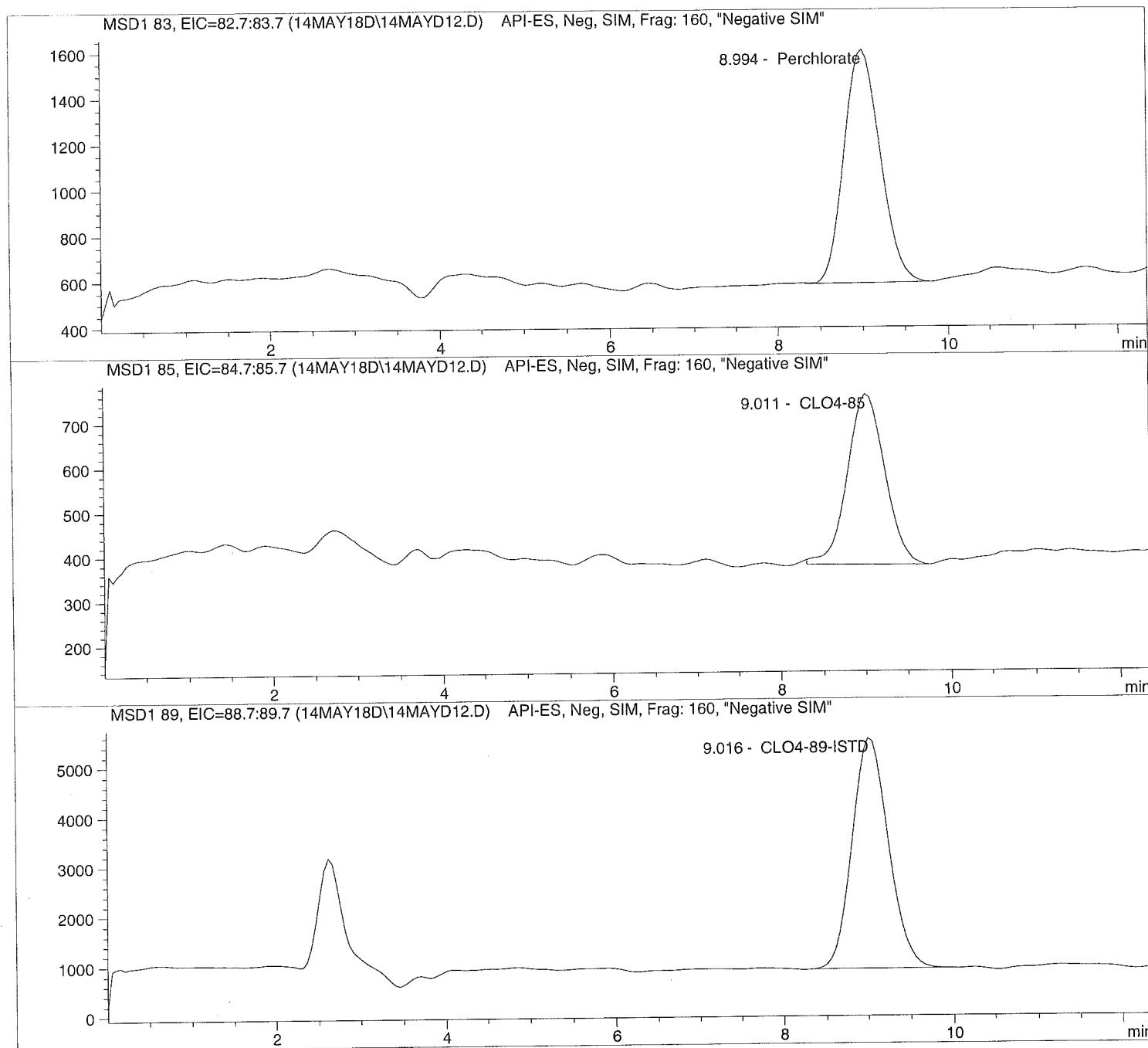
```
=====
*** End of Report ***
=====
```

Injection Date: 5/14/2018 11:58:07
Sample Name: 1813195005 1K
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  5/14/2018  11:58:07      Seq Line:           12
Sample Name:    1813195005  1K          Location:          Vial 82
Acq Operator:   TNB                Inj. No.:            1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.994	BBA	30578.6	987.3337	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.011	BBA	11977.0	1096.2494	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.016	PBA	139602.6	5000.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD13.D

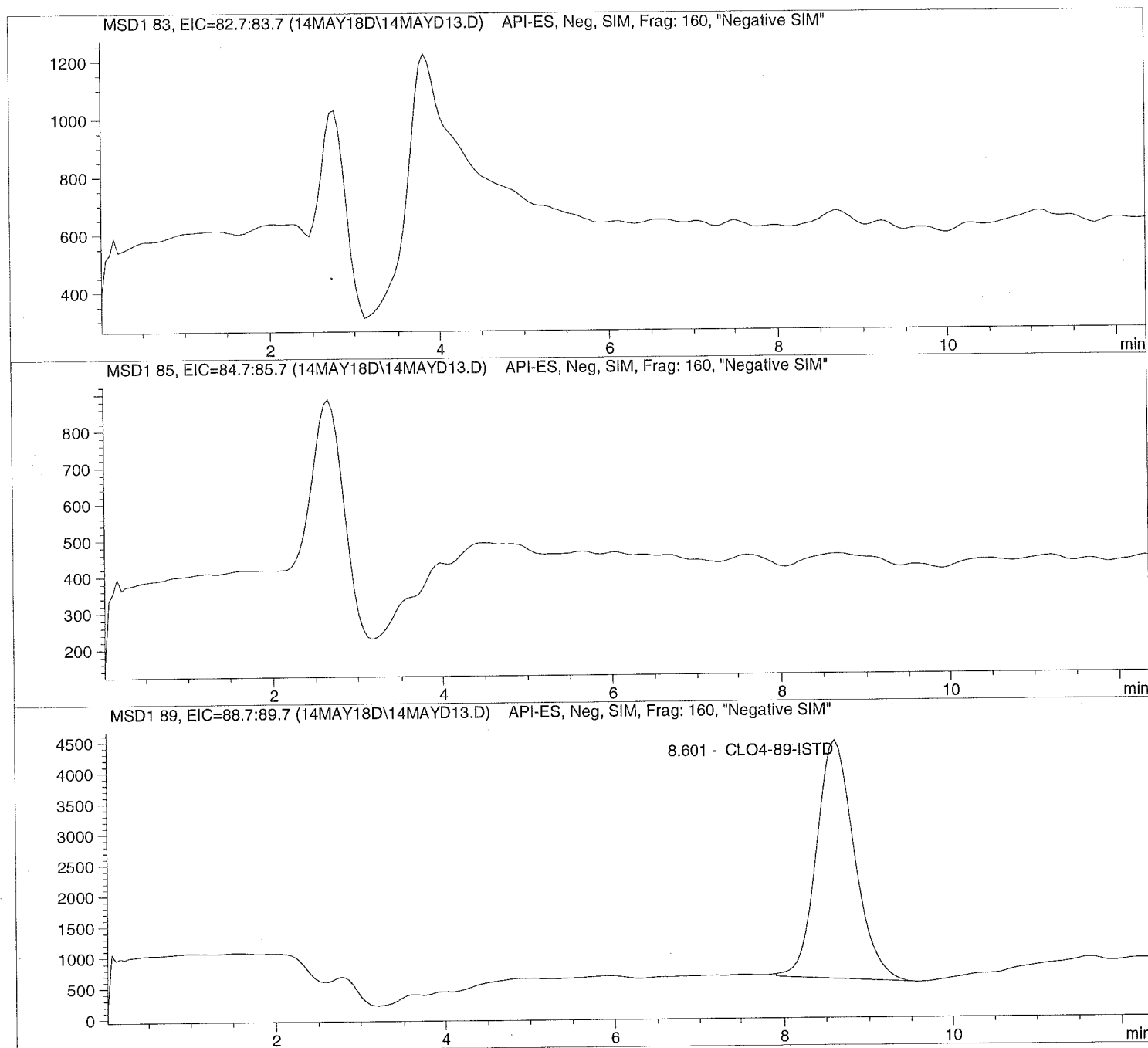
Sample Name: 1813197001

Injection Date: 5/14/2018 12:12:18
Sample Name: 1813197001
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD13.D

Sample Name: 1813197001

```
=====
Injection Date:  5/14/2018  12:12:18      Seq Line:          13
Sample Name:    1813197001              Location:         Vial 83
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:       25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.601	BBA	119456.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD14.D

Sample Name: 1813197002

Injection Date: 5/14/2018 12:26:32

Sample Name: 1813197002

Acq Operator: TNB

Seq Line: 14

Location: Vial 84

Inj. No.: 1

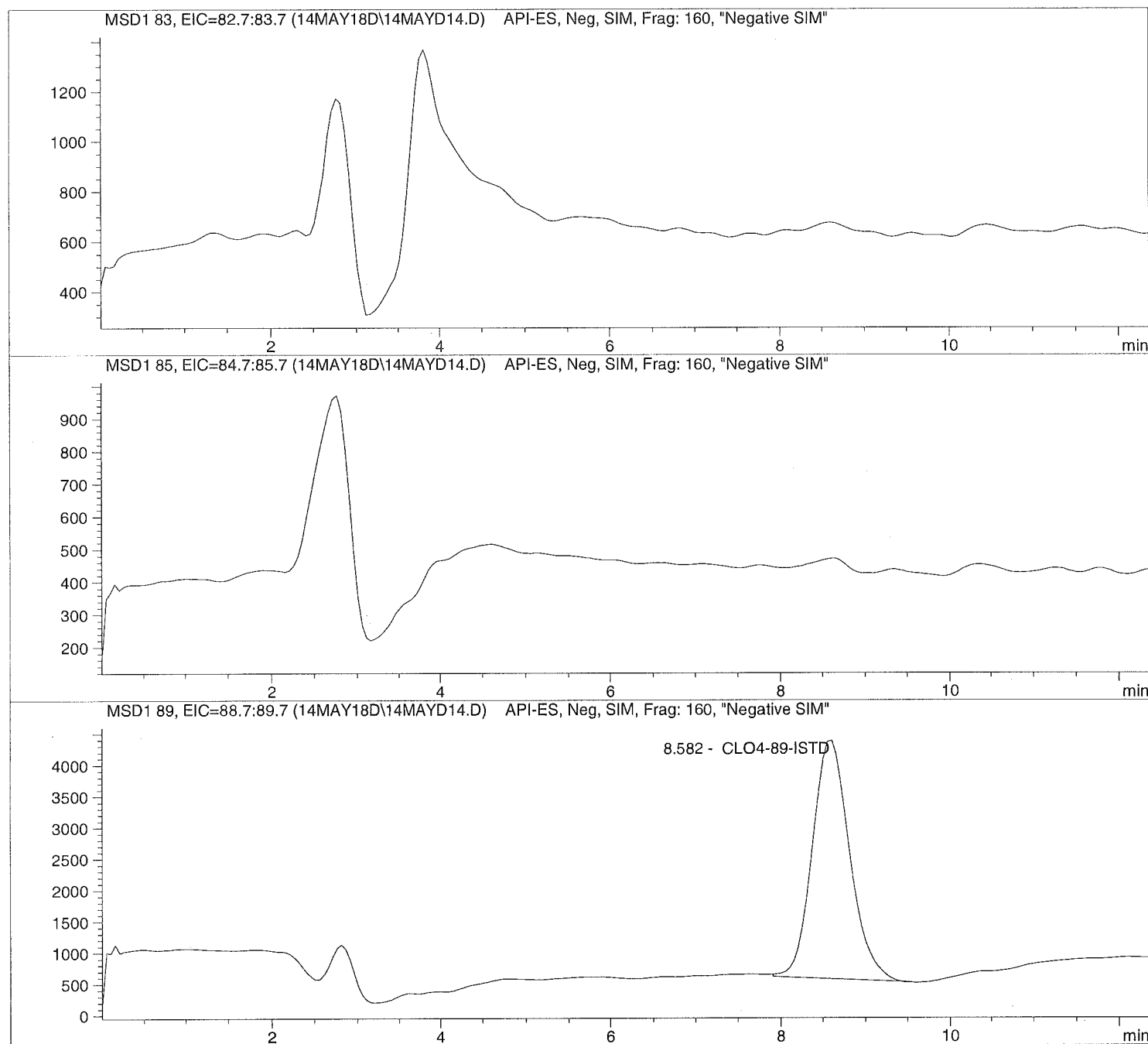
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD14.D

Sample Name: 1813197002

```
=====
Injection Date:  5/14/2018  12:26:32      Seq Line:           14
Sample Name:    1813197002      Location:           Vial 84
Acq Operator:   TNB             Inj. No.:           1
                                      Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.582	BBA	116200.9	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD15.D

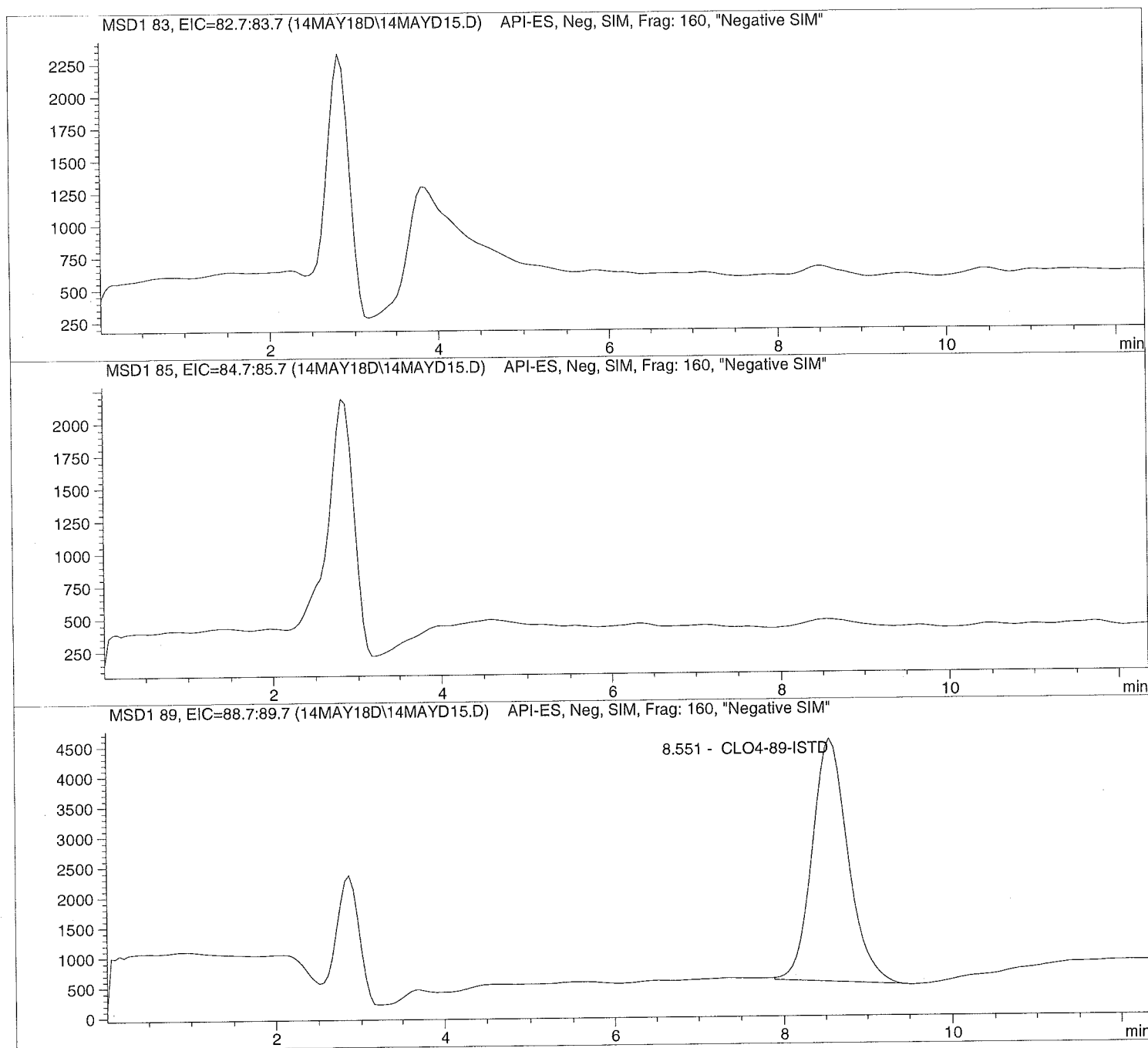
Sample Name: 1813197003

Injection Date: 5/14/2018 12:40:42
Sample Name: 1813197003
Acq Operator: TNB

Seq Line: 15
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD15.D

Sample Name: 1813197003

```

=====
Injection Date:  5/14/2018  12:40:42      Seq Line:           15
Sample Name:    1813197003      Location:           Vial 85
Acq Operator:   TNB             Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.551	BBA	120044.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD16.D

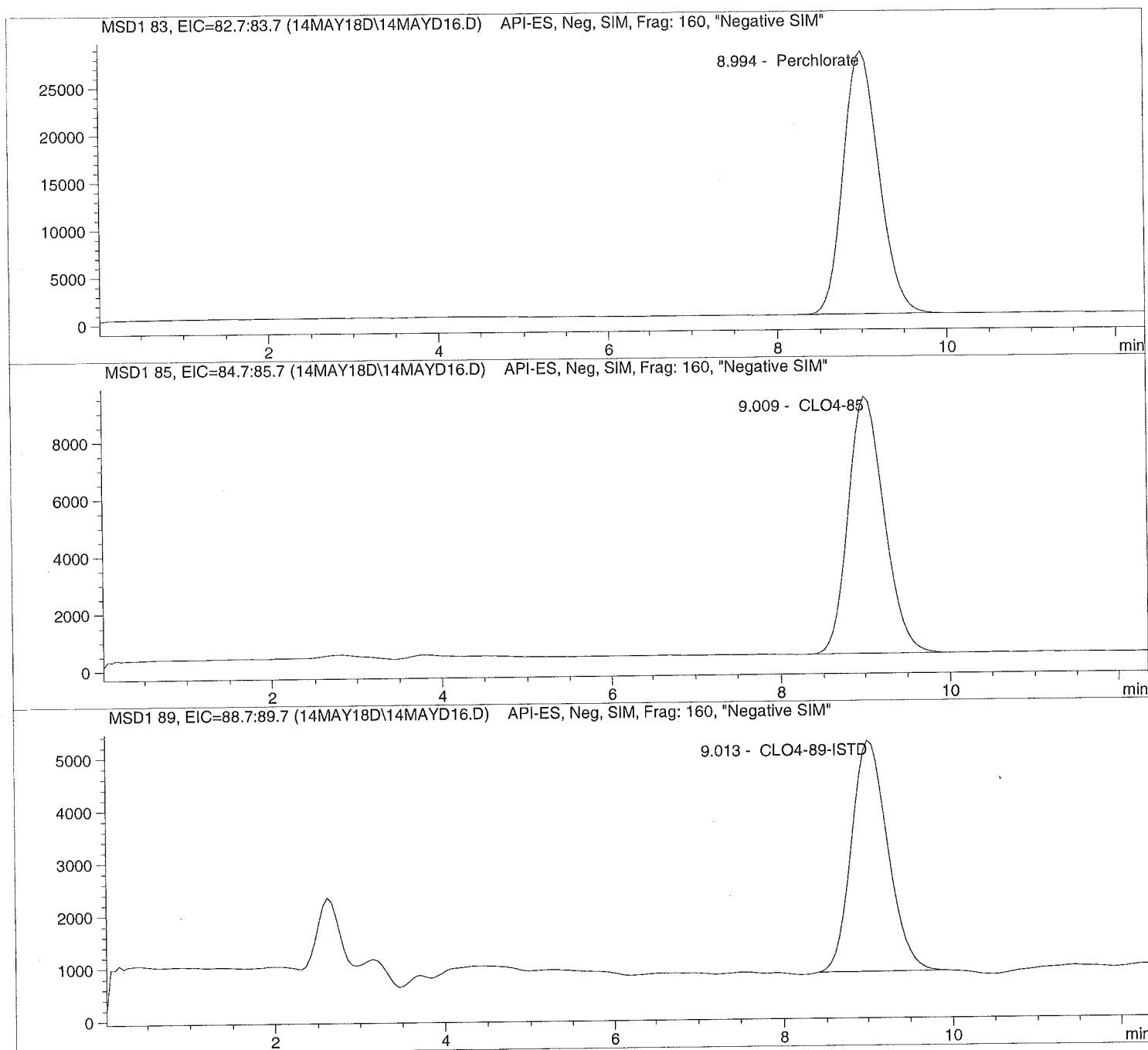
Sample Name: 600647 CCV@25

Injection Date: 5/14/2018 12:54:52
Sample Name: 600647 CCV@25
Acq Operator: TNB

Seq Line: 16
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD16.D

Sample Name: 600647 CCV@25

Injection Date: 5/14/2018 12:54:52 Seq Line: 16
Sample Name: 600647 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.994	PBA	826446.3	25.3458	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.009	PBA	271042.8	26.5961	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.013	BBA	133238.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD17.D

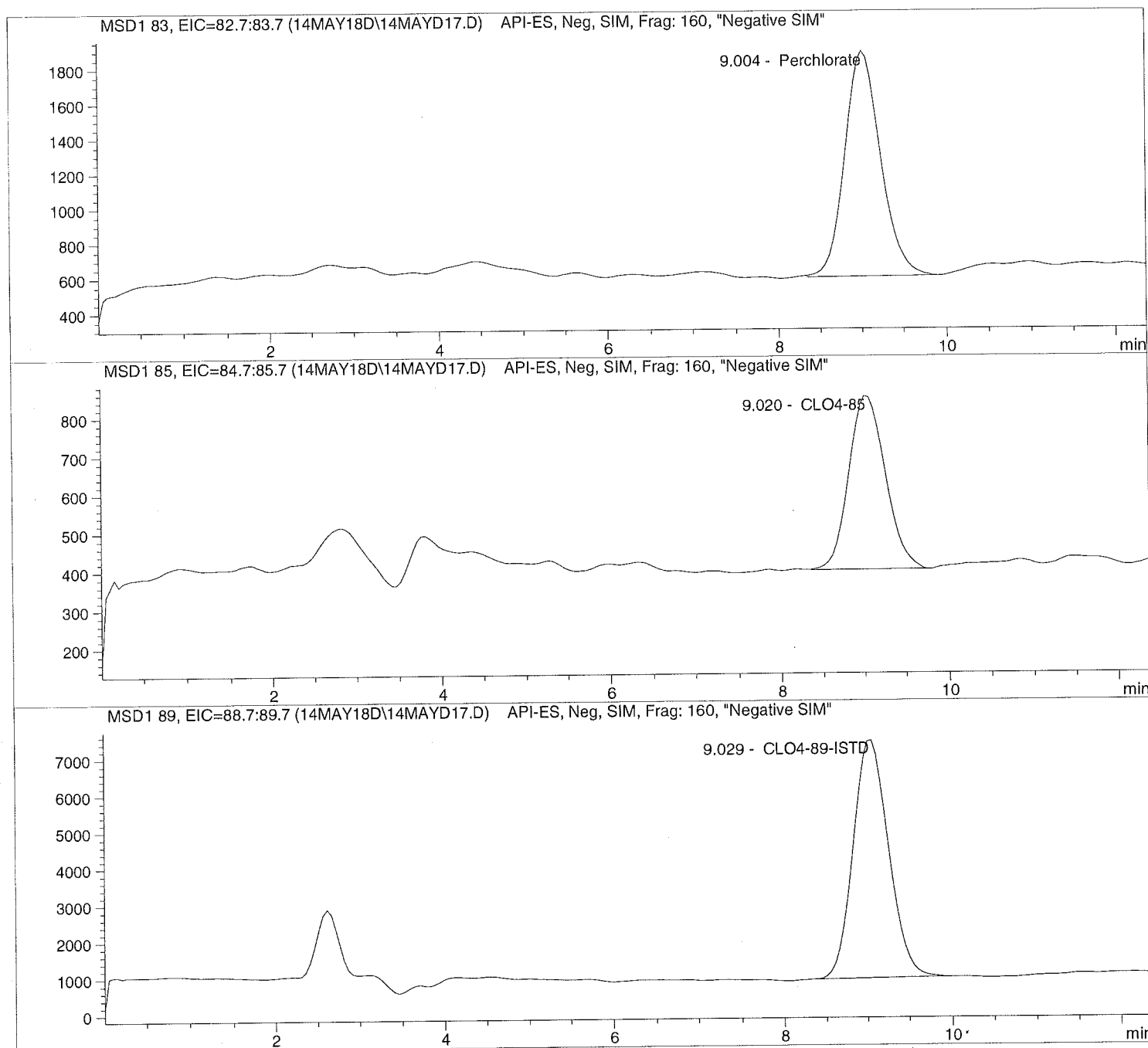
Sample Name: 600648 LODV@1.

Injection Date: 5/14/2018 13:09:01
Sample Name: 600648 LODV@1.
Acq Operator: TNB

Seq Line: 17
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD17.D Sample Name: 600648 LODV@1.

Injection Date: 5/14/2018 13:09:01 Seq Line: 17
Sample Name: 600648 LODV@1. Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	BBA	39196.4	0.9046	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.020	BBA	14002.6	0.8931	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.029	BBA	194615.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD18.D

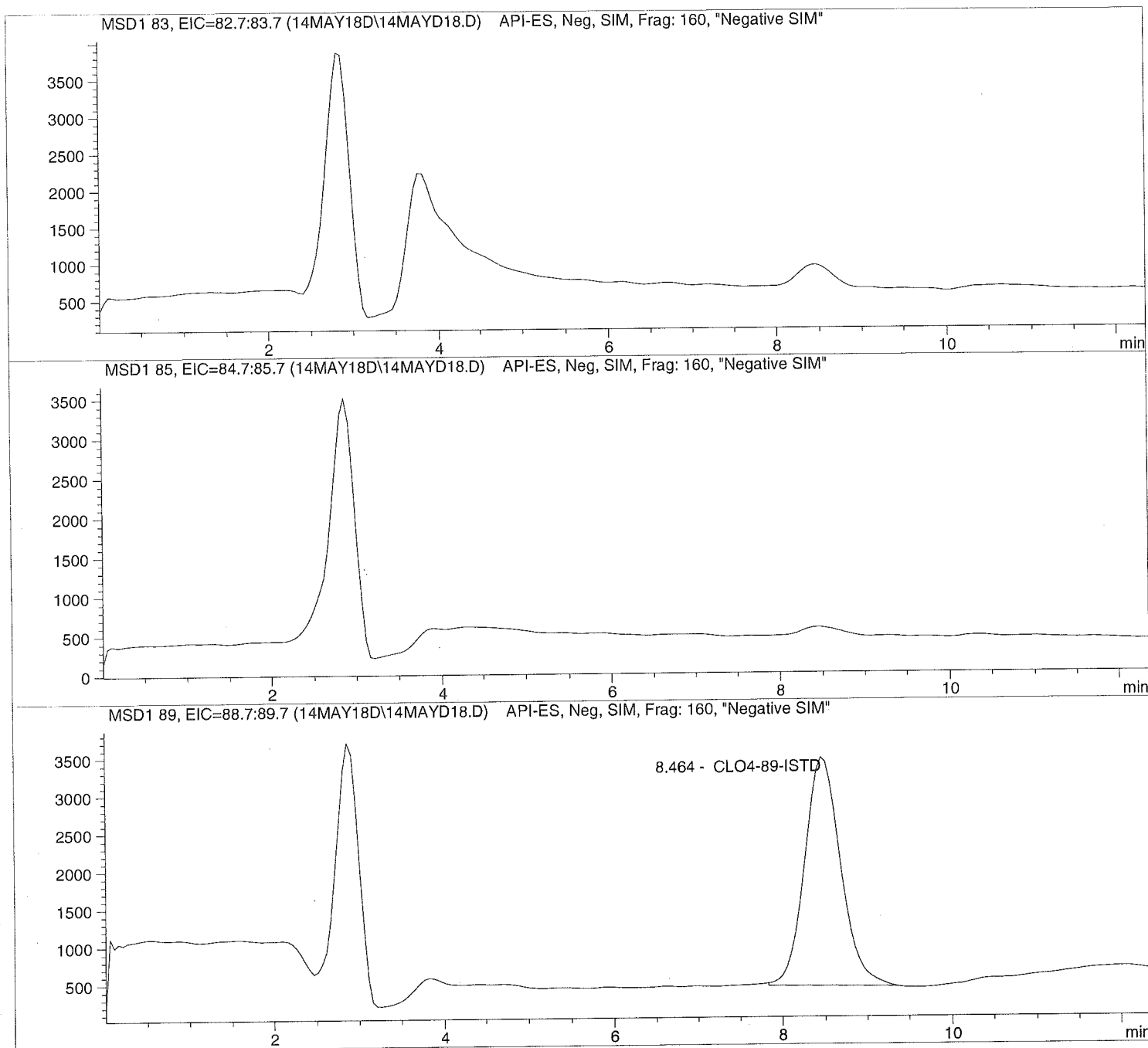
Sample Name: 1813197004

Injection Date: 5/14/2018 13:23:12
Sample Name: 1813197004
Acq Operator: TNB

Seq Line: 18
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD18.D

Sample Name: 1813197004

```
=====
Injection Date:  5/14/2018  13:23:12      Seq Line:          18
Sample Name:    1813197004              Location:         Vial 86
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:       25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.464	BBA	88510.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD19.D

Sample Name: 1813197005

Injection Date: 5/14/2018 13:37:22

Seq Line: 19

Sample Name: 1813197005

Location: Vial 87

Acq Operator: TNB

Inj. No.: 1

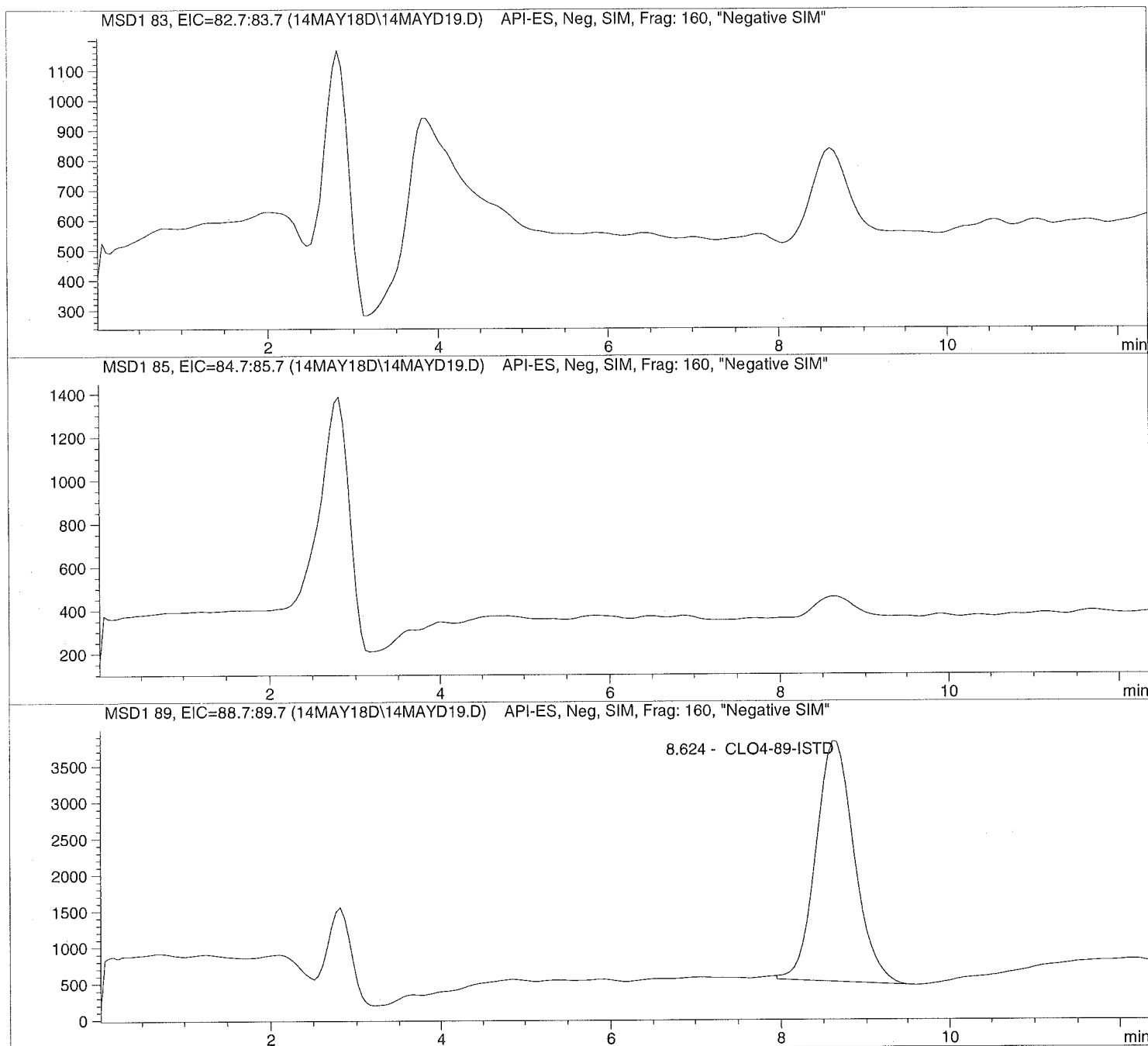
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD19.D

Sample Name: 1813197005

```
=====
Injection Date:  5/14/2018  13:37:22      Seq Line:           19
Sample Name:    1813197005      Location:          Vial 87
Acq Operator:   TNB             Inj. No.:           1
                                   Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	BBA	102707.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD20.D

Sample Name: 1813197006 10K

Injection Date: 5/14/2018 13:51:33

Seq Line: 20

Sample Name: 1813197006 10K

Location: Vial 88

Acq Operator: TNB

Inj. No.: 1

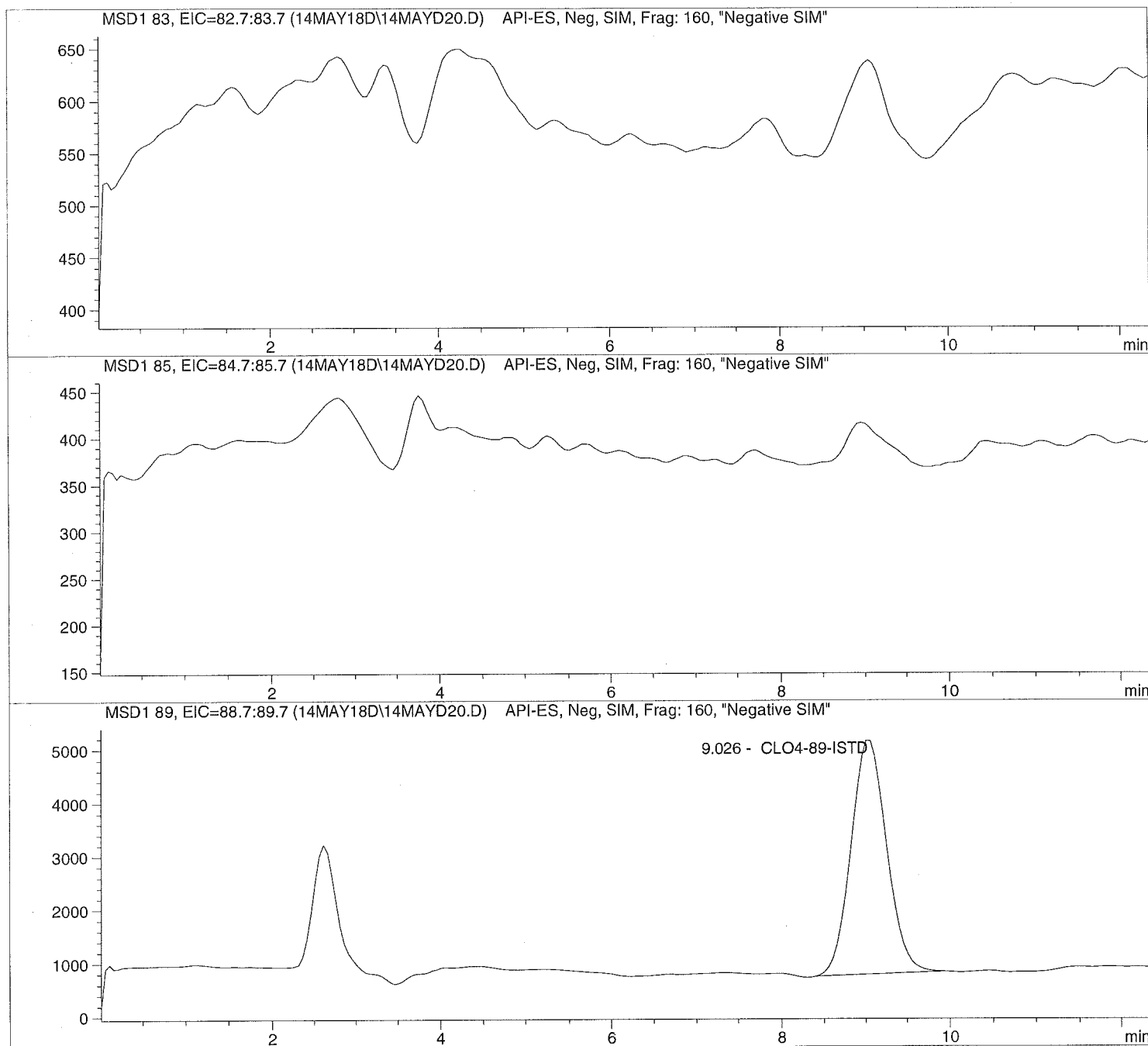
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD20.D

Sample Name: 1813197006 10K

Injection Date: 5/14/2018 13:51:33

Seq Line: 20

Sample Name: 1813197006 10K

Location: Vial 88

Acq Operator: TNB

Inj. No.: 1

Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal

Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am

Multiplier: 1.000000

Dilution: 10000.000000

Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.026	PBA	131046.0	50000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD21.D

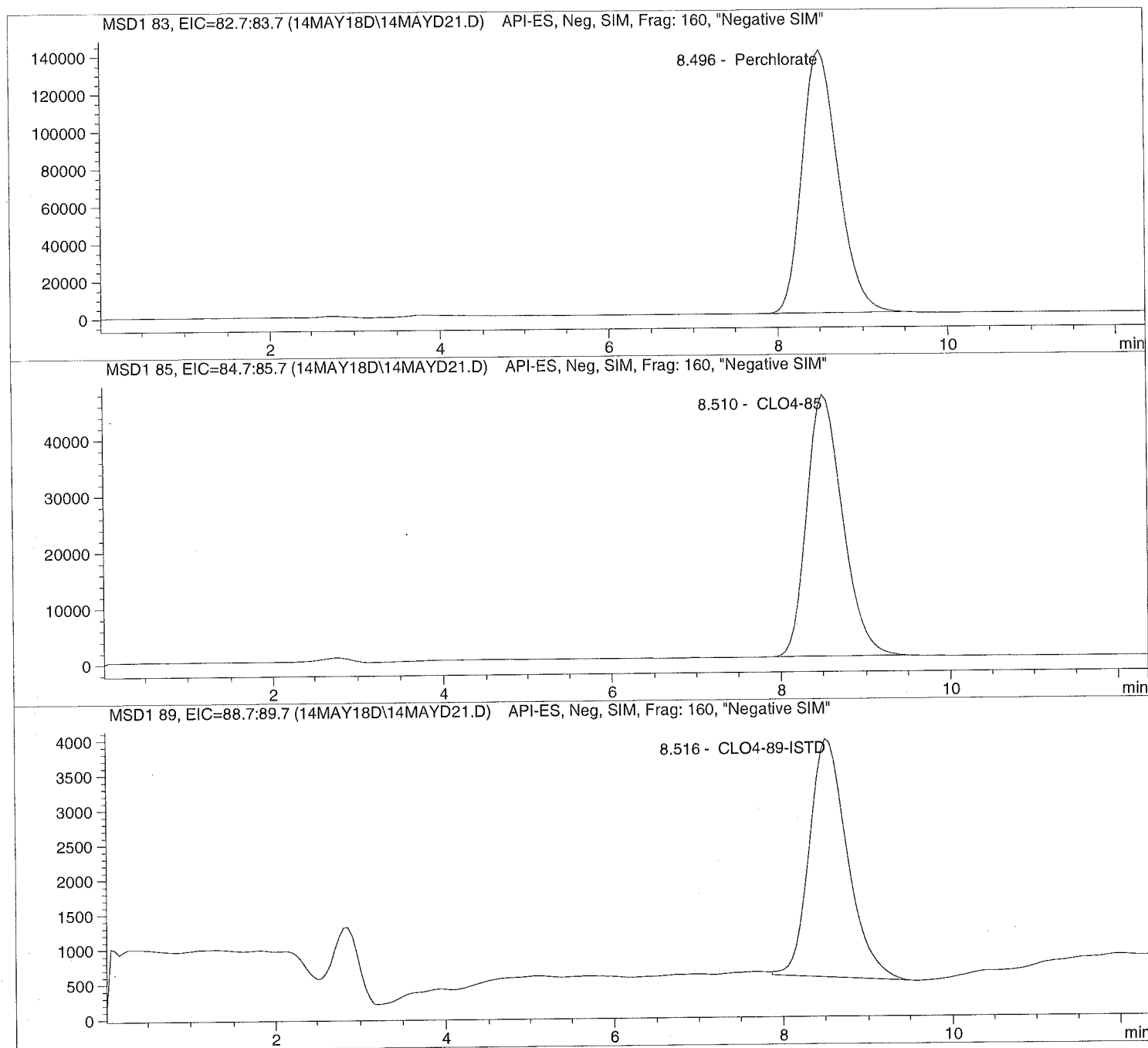
Sample Name: 1813198001

Injection Date: 5/14/2018 14:05:45
Sample Name: 1813198001
Acq Operator: TNB

Seq Line: 21
Location: Vial 89
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD21.D

Sample Name: 1813198001

```
=====
Injection Date:  5/14/2018  14:05:45      Seq Line:           21
Sample Name:    1813198001      Location:           Vial 89
Acq Operator:   TNB             Inj. No.:           1
                                      Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.496	PBA	4147835.0	110.2654	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.510	PBA	1367027.8	121.5841	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.516	BBA	105371.7	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD23.D

Sample Name: 1813198004

Injection Date: 5/14/2018 14:36:12

Seq Line: 23

Sample Name: 1813198004

Location: Vial 92

Acq Operator: TNB

Inj. No.: 1

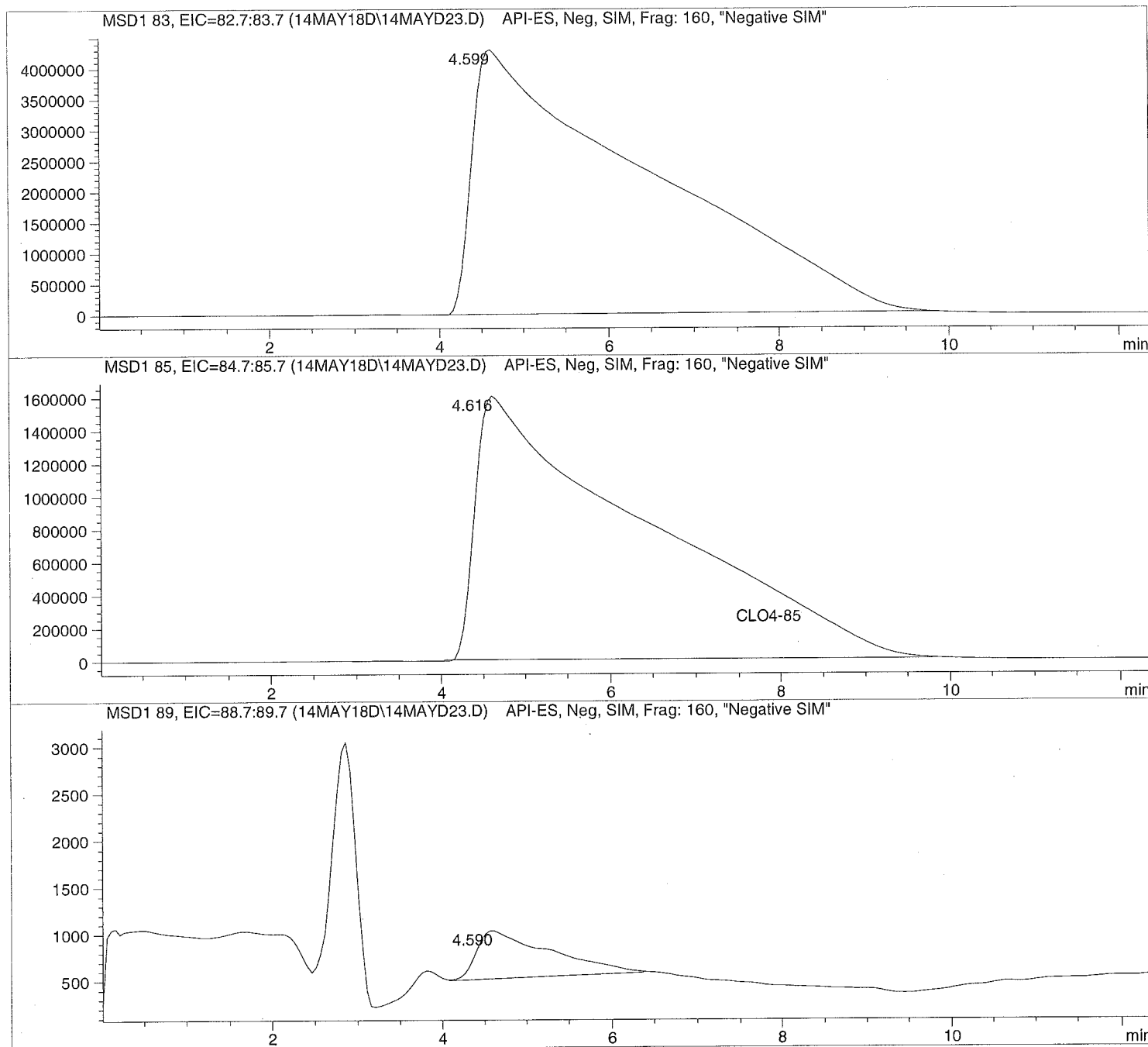
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD23.D

Sample Name: 1813198004

```

=====
Injection Date: 5/14/2018 14:36:12      Seq Line:          23
Sample Name:    1813198004              Location:          Vial 92
Acq Operator:   TNB                     Inj. No.:          1
                                           Inj. Vol.:         25 µl
=====

```

```

Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018 11:32:43
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
4.599	MM	618439040.0	0.0000	Perchlorate
0.000		0.0	0.0000	

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
4.616	MM	221683744.0	0.0000	CLO4-85
6.087	Rsho	0.0	0.0000	
6.708	Rsho	0.0	0.0000	
7.224	Rsho	0.0	0.0000	
7.673	Rsho	0.0	0.0000	
8.239	Rsho	0.0	0.0000	

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
4.590	MM	30765.0	0.0000	CLO4-89-ISTD
0.000		0.0	0.0000	

```

=====
*** End of Report ***
=====

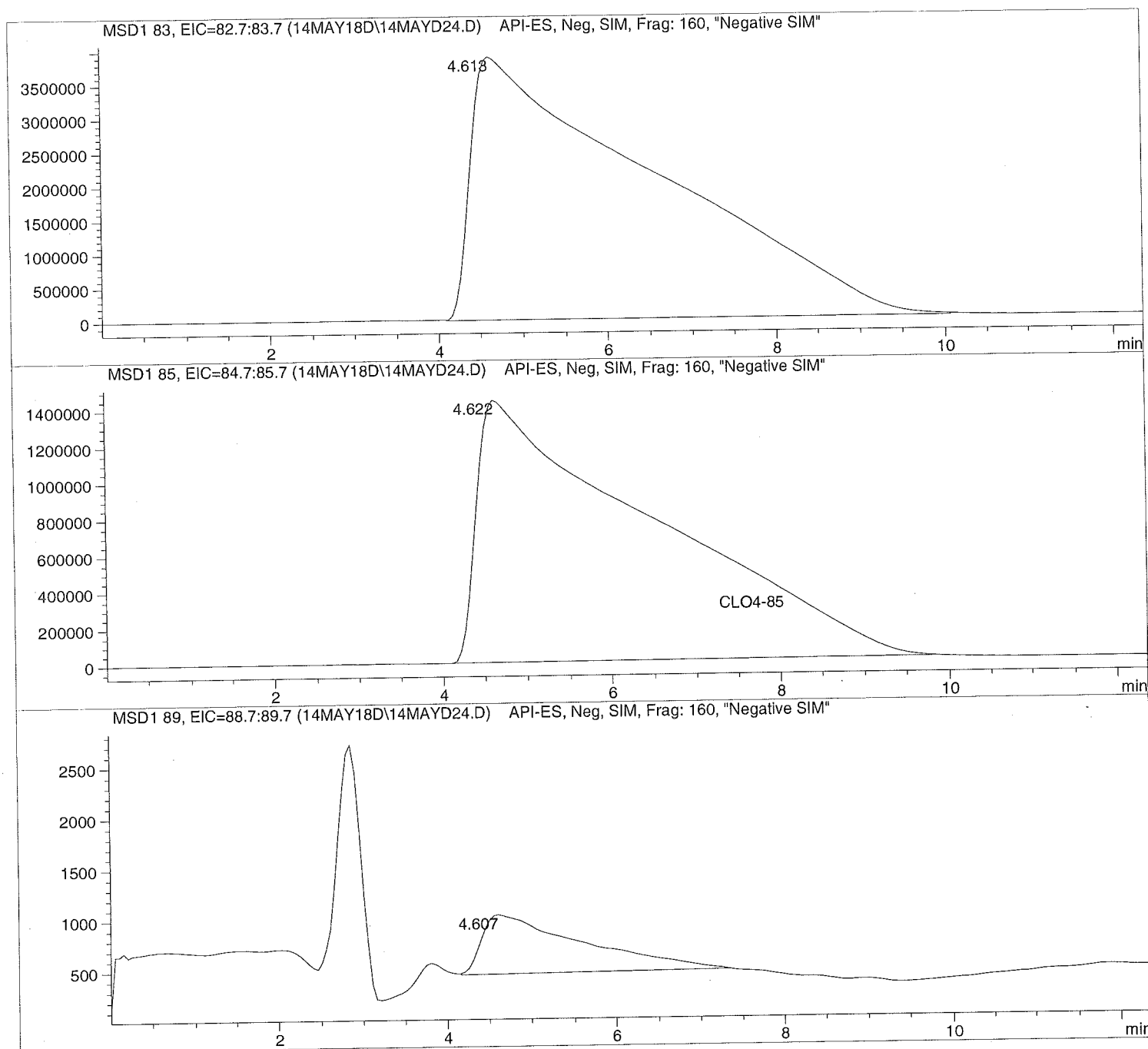
```

Injection Date: 5/14/2018 14:50:21
Sample Name: 1813198005
Acq Operator: TNB

Seq Line: 24
Location: Vial 93
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD24.D

Sample Name: 1813198005

```
=====
Injection Date:  5/14/2018  14:50:21      Seq Line:           24
Sample Name:    1813198005      Location:           Vial 93
Acq Operator:   TNB             Inj. No.:           1
                                      Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
4.613	MM	592694016.0	0.0000	Perchlorate
0.000		0.0	0.0000	

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
4.622	MM	208859888.0	0.0000	CLO4-85
5.728	Rsho	0.0	0.0000	
6.258	Rsho	0.0	0.0000	
6.607	Rsho	0.0	0.0000	
6.874	Rsho	0.0	0.0000	
8.043	Rsho	0.0	0.0000	

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
4.607	MM	47374.5	0.0000	CLO4-89-ISTD
0.000		0.0	0.0000	

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD25.D

Sample Name: Rinse

Injection Date: 5/14/2018 15:04:34

Seq Line: 25

Sample Name: Rinse

Location: Vial 61

Acq Operator: TNB

Inj. No.: 1

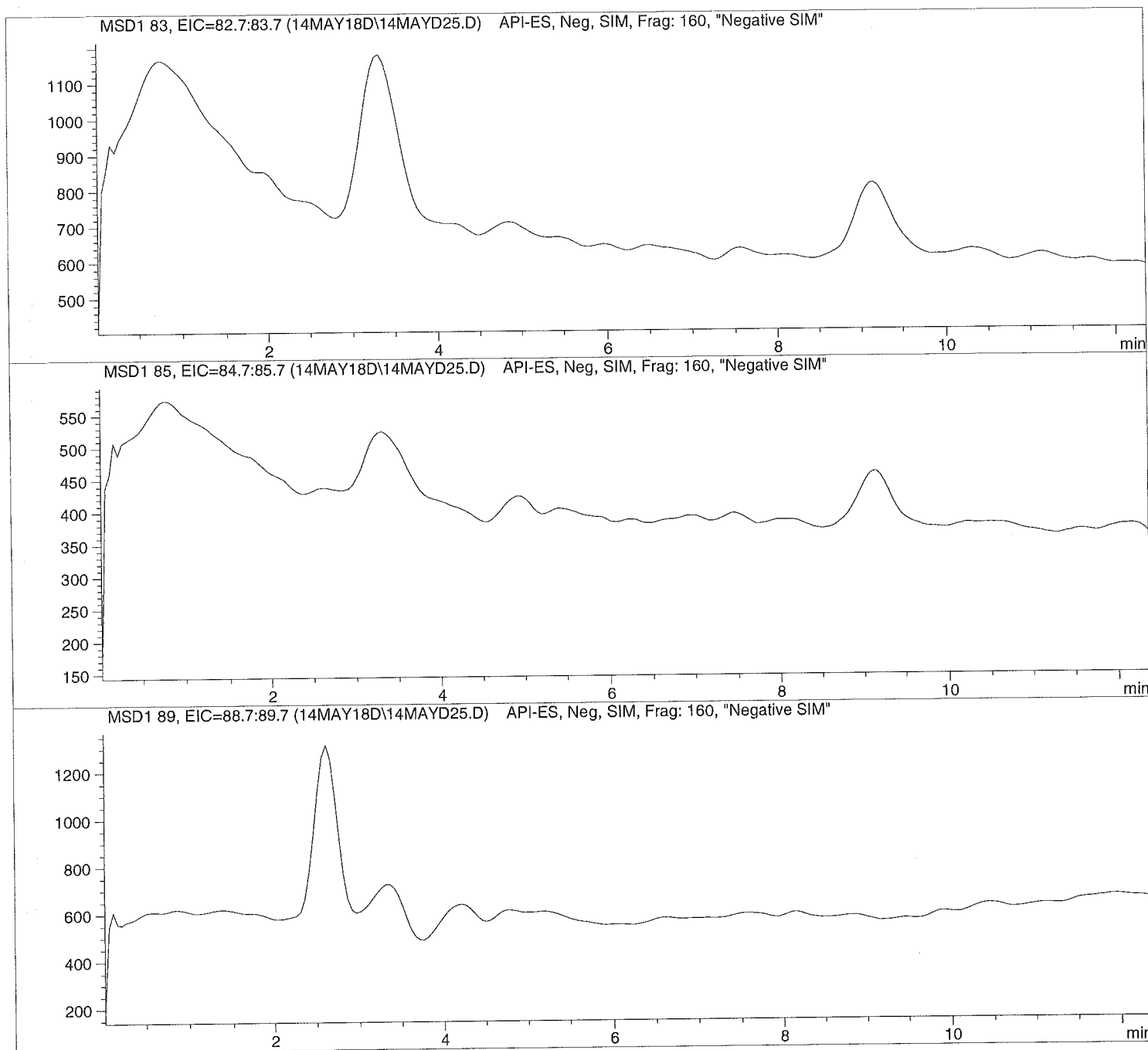
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD25.D

Sample Name: Rinse

```
=====
Injection Date: 5/14/2018 15:04:34      Seq Line:      25
Sample Name:    Rinse                  Location:      Vial 61
Acq Operator:   TNB                   Inj. No.:      1
                                           Inj. Vol.:    25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018 11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD26.D

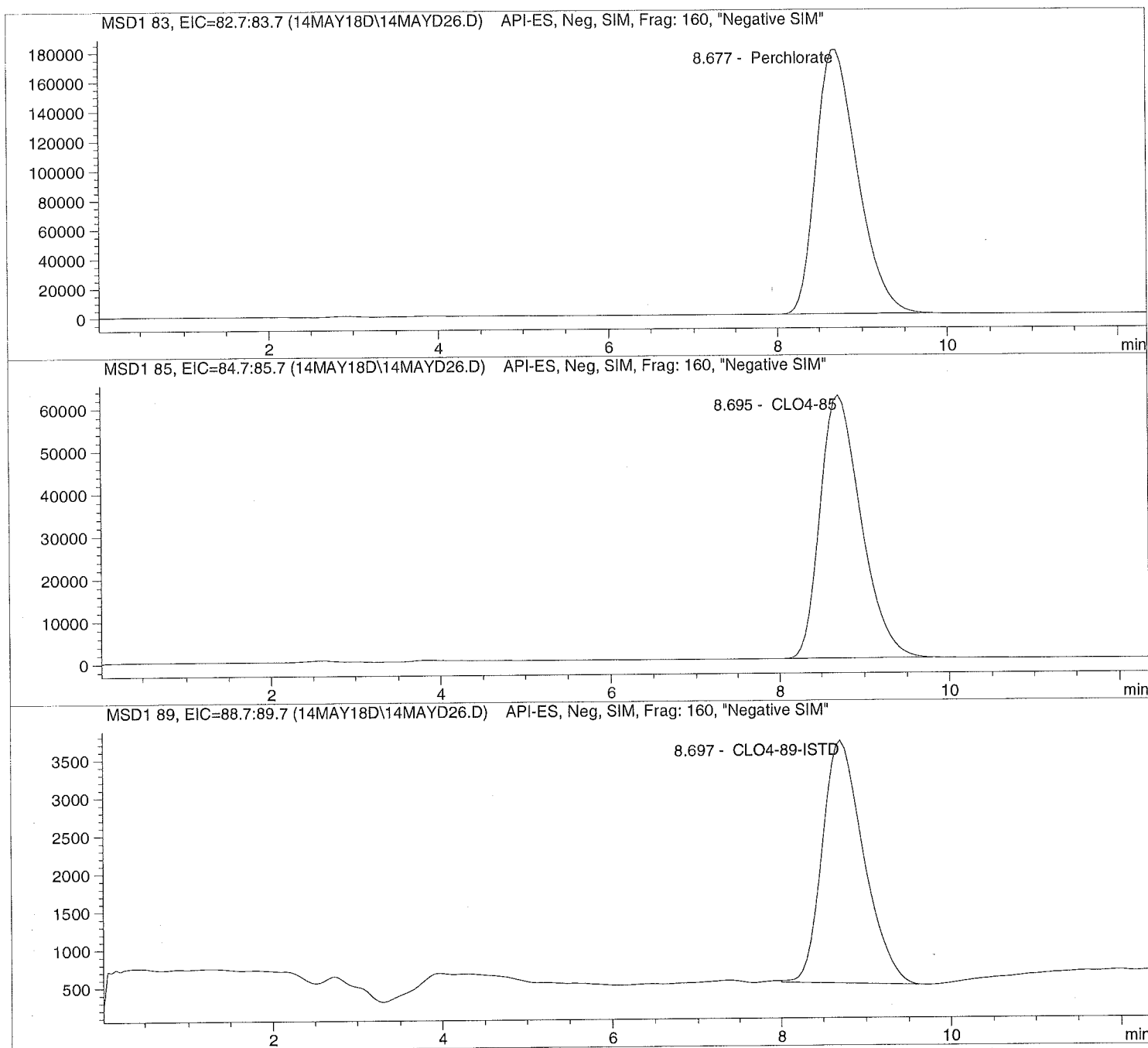
Sample Name: 1813197006

Injection Date: 5/14/2018 15:20:50
Sample Name: 1813197006
Acq Operator: TNB

Seq Line: 26
Location: Vial 94
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD26.D

Sample Name: 1813197006

```
=====
Injection Date:  5/14/2018  15:20:50      Seq Line:           26
Sample Name:    1813197006      Location:           Vial 94
Acq Operator:   TNB             Inj. No.:           1
                                   Inj. Vol.:           25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.677	PBA	6088971.5	142.3630	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	2056338.9	160.9504	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.697	BBA	107056.1	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Injection Date: 5/14/2018 15:35:03

Seq Line: 27

Sample Name: 1813195003 100

Location: Vial 95

Acq Operator: TNB

Inj. No.: 1

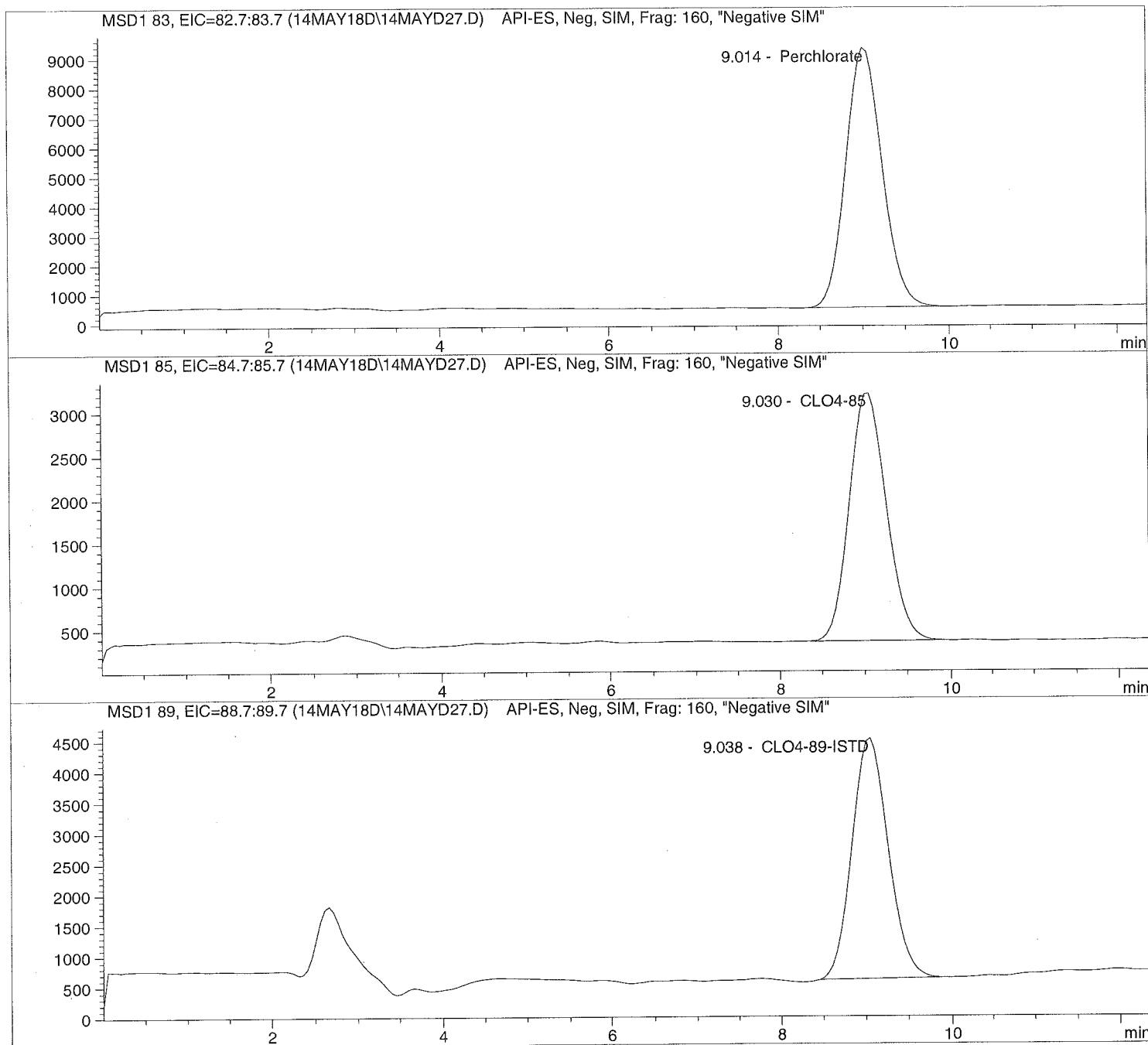
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD27.D Sample Name: 1813195003 100

Injection Date: 5/14/2018 15:35:03 Seq Line: 27
Sample Name: 1813195003 100 Location: Vial 95
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 100.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.014	PBA	263387.6	998.6064	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.030	BBA	87036.2	1032.0193	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.038	PBA	117249.3	500.0000	CLO4-89-ISTD

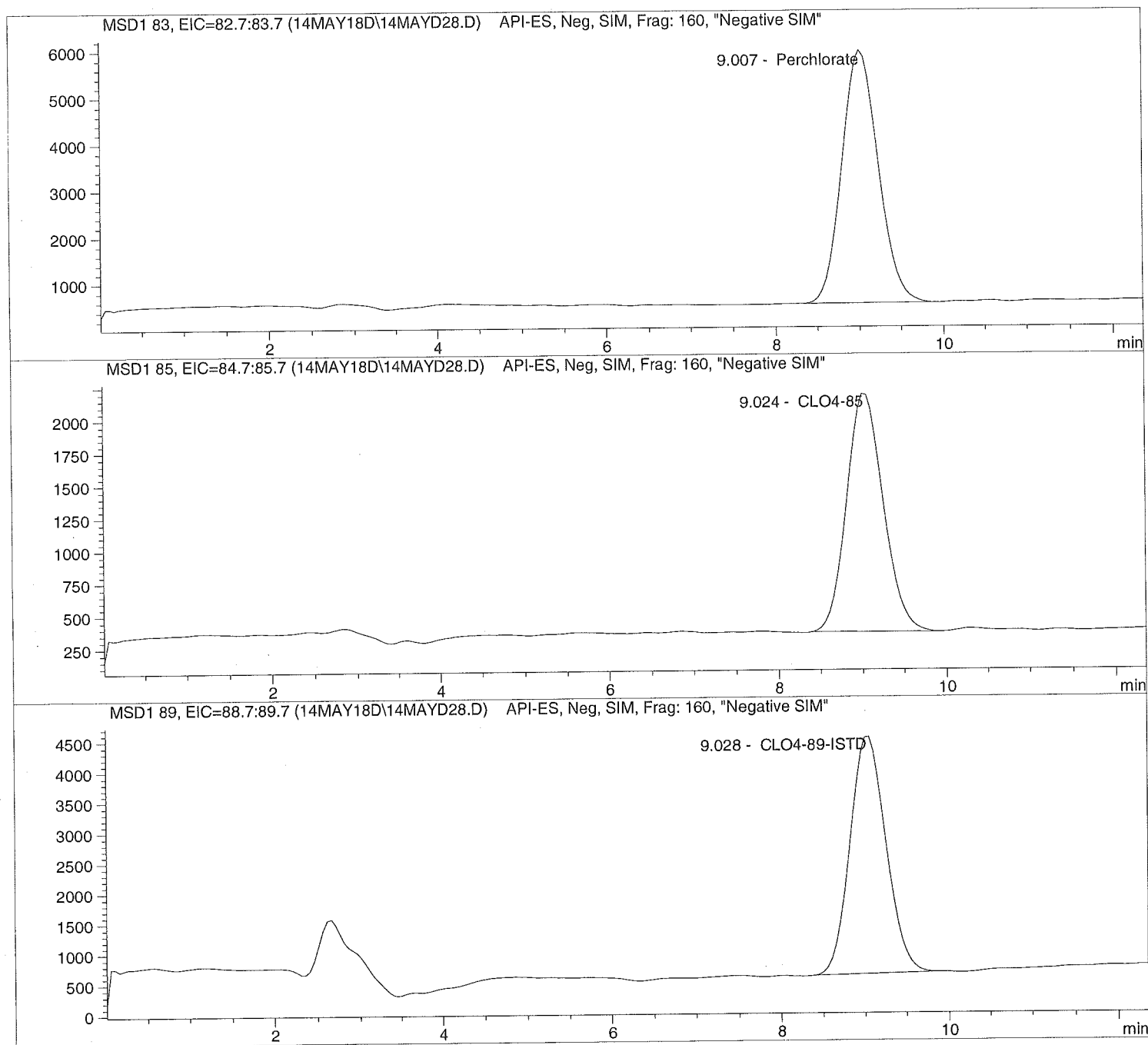
*** End of Report ***

Injection Date: 5/14/2018 15:49:15
Sample Name: 1813195005 100
Acq Operator: TNB

Seq Line: 28
Location: Vial 96
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD28.D

Sample Name: 1813195005 100

```
=====
Injection Date:  5/14/2018  15:49:15      Seq Line:          28
Sample Name:    1813195005   100          Location:         Vial 96
Acq Operator:   TNB              Inj. No.:           1
                                      Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       100.000000
Sample Amount:  0.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.007	BBA	165623.3	638.2802	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.024	PBA	56077.9	668.4546	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	117560.8	500.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD29.D

Sample Name: 600649 CCV@25

Injection Date: 5/14/2018 16:03:27

Seq Line: 29

Sample Name: 600649 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

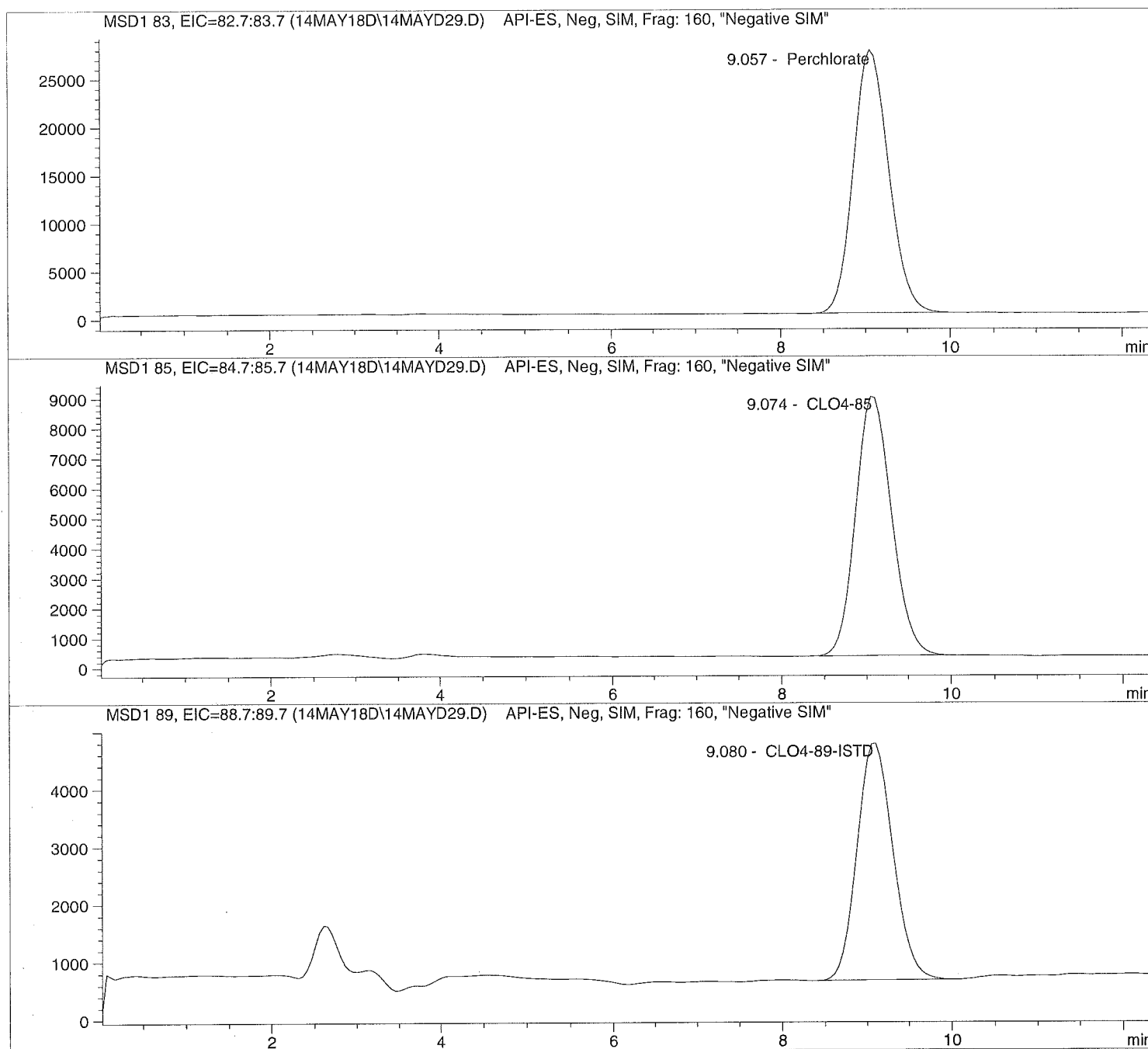
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Injection Date: 5/14/2018 16:03:27 Seq Line: 29
Sample Name: 600649 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.057	PBA	806835.4	26.5820	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.074	PBA	259768.2	27.4684	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.080	PBA	123211.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD30.D

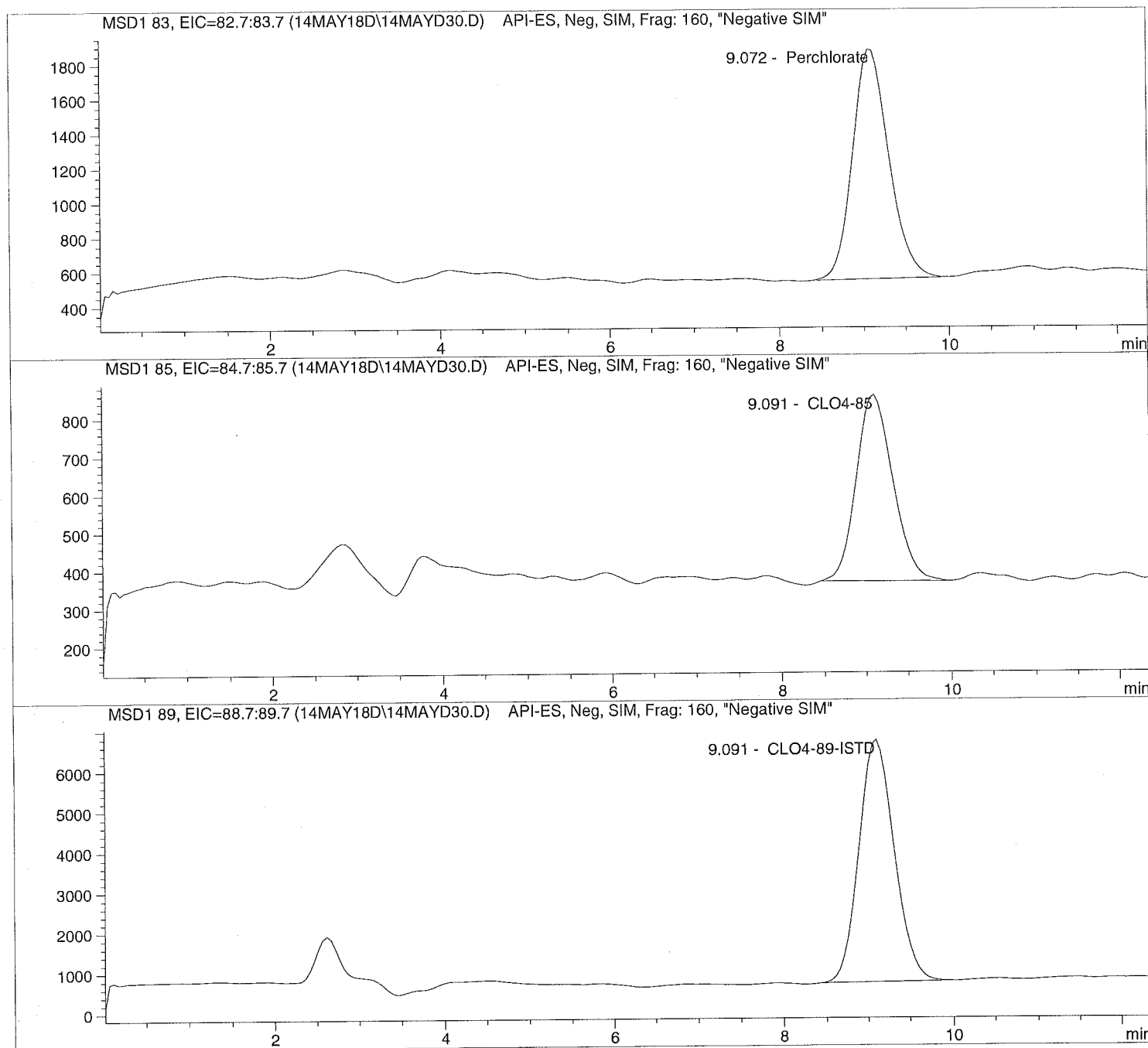
Sample Name: 600650 LODV@1.

Injection Date: 5/14/2018 16:17:37
Sample Name: 600650 LODV@1.
Acq Operator: TNB

Seq Line: 30
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD30.D

Sample Name: 600650 LODV@1.

```
=====
Injection Date:  5/14/2018  16:17:37          Seq Line:          30
Sample Name:    600650    LODV@1.            Location:          Vial 72
Acq Operator:   TNB                               Inj. No.:          1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.072	PBA	40534.9	1.0342	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	PBA	15085.4	1.0881	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	176980.5	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD31.D

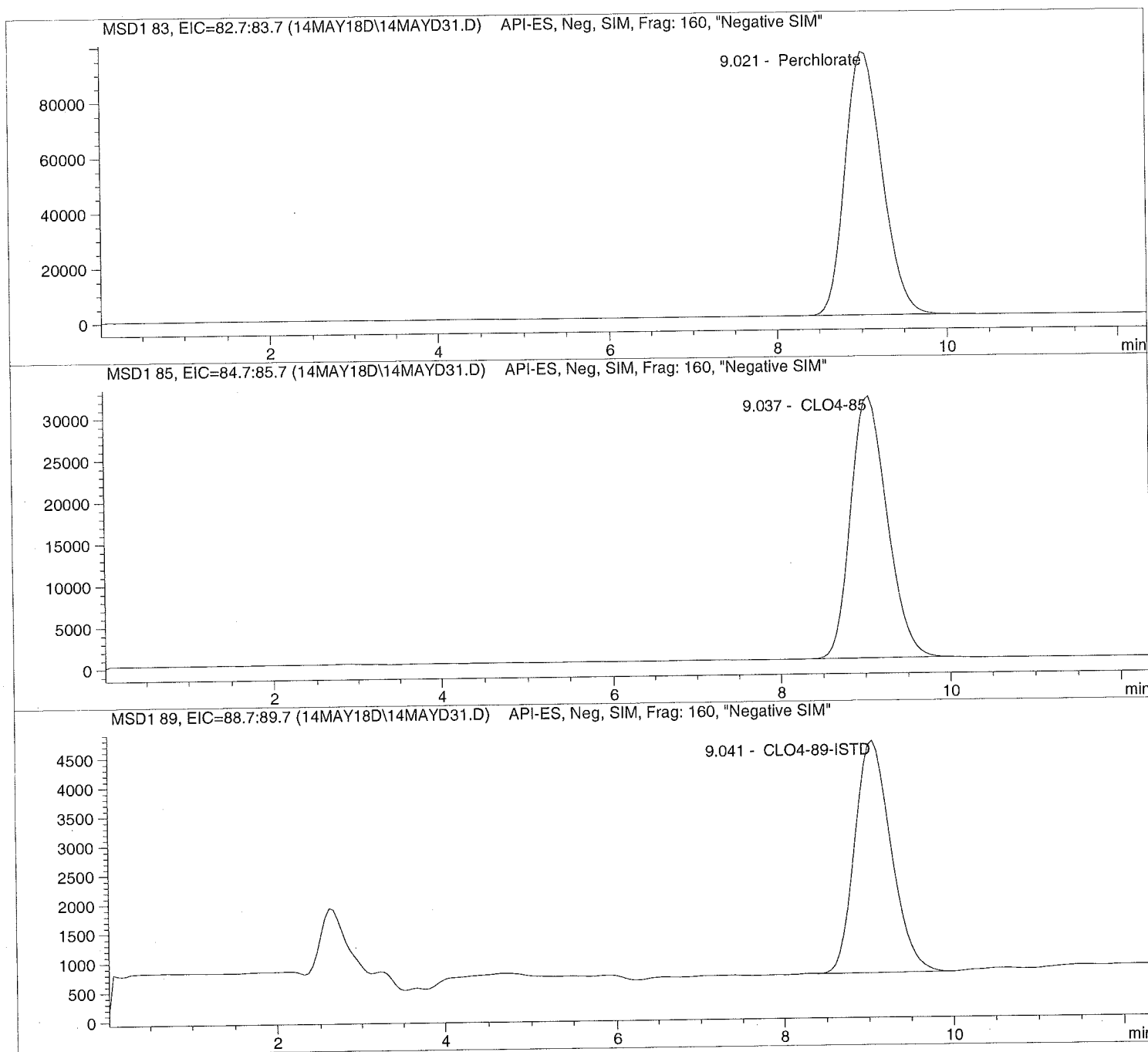
Sample Name: 1813198004 1K

Injection Date: 5/14/2018 16:31:51
Sample Name: 1813198004 1K
Acq Operator: TNB

Seq Line: 31
Location: Vial 62
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  5/14/2018  16:31:51      Seq Line:          31
Sample Name:    1813198004  1K           Location:         Vial 62
Acq Operator:   TNB                Inj. No.:          1
                                           Inj. Vol.:        25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.021	PBA	2880122.0	77807.2905	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.037	PBA	937896.1	84040.6337	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.041	BBA	117883.7	5000.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD32.D

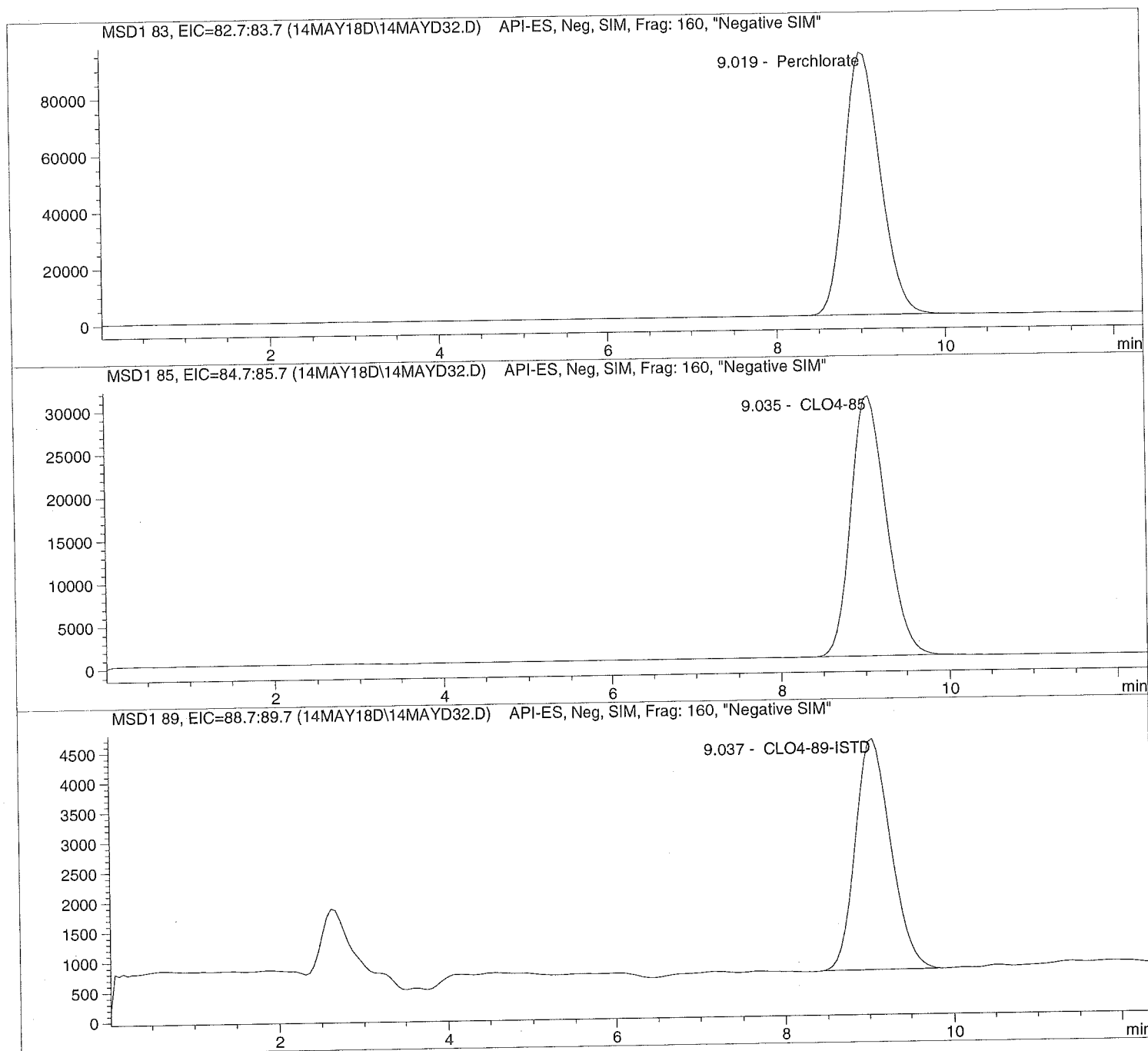
Sample Name: 1813198005 1K

Injection Date: 5/14/2018 16:46:03
Sample Name: 1813198005 1K
Acq Operator: TNB

Seq Line: 32
Location: Vial 63
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD32.D

Sample Name: 1813198005 1K

```
=====
Injection Date:  5/14/2018  16:46:03      Seq Line:          32
Sample Name:    1813198005  1K           Location:         Vial 63
Acq Operator:   TNB                Inj. No.:           1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:   0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.019	PBA	2798969.8	77164.3910	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.035	PBA	907244.8	83021.1532	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.037	PBA	115830.6	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD33.D

Sample Name: 1813198001 10X

Injection Date: 5/14/2018 17:00:17

Seq Line: 33

Sample Name: 1813198001 10X

Location: Vial 97

Acq Operator: TNB

Inj. No.: 1

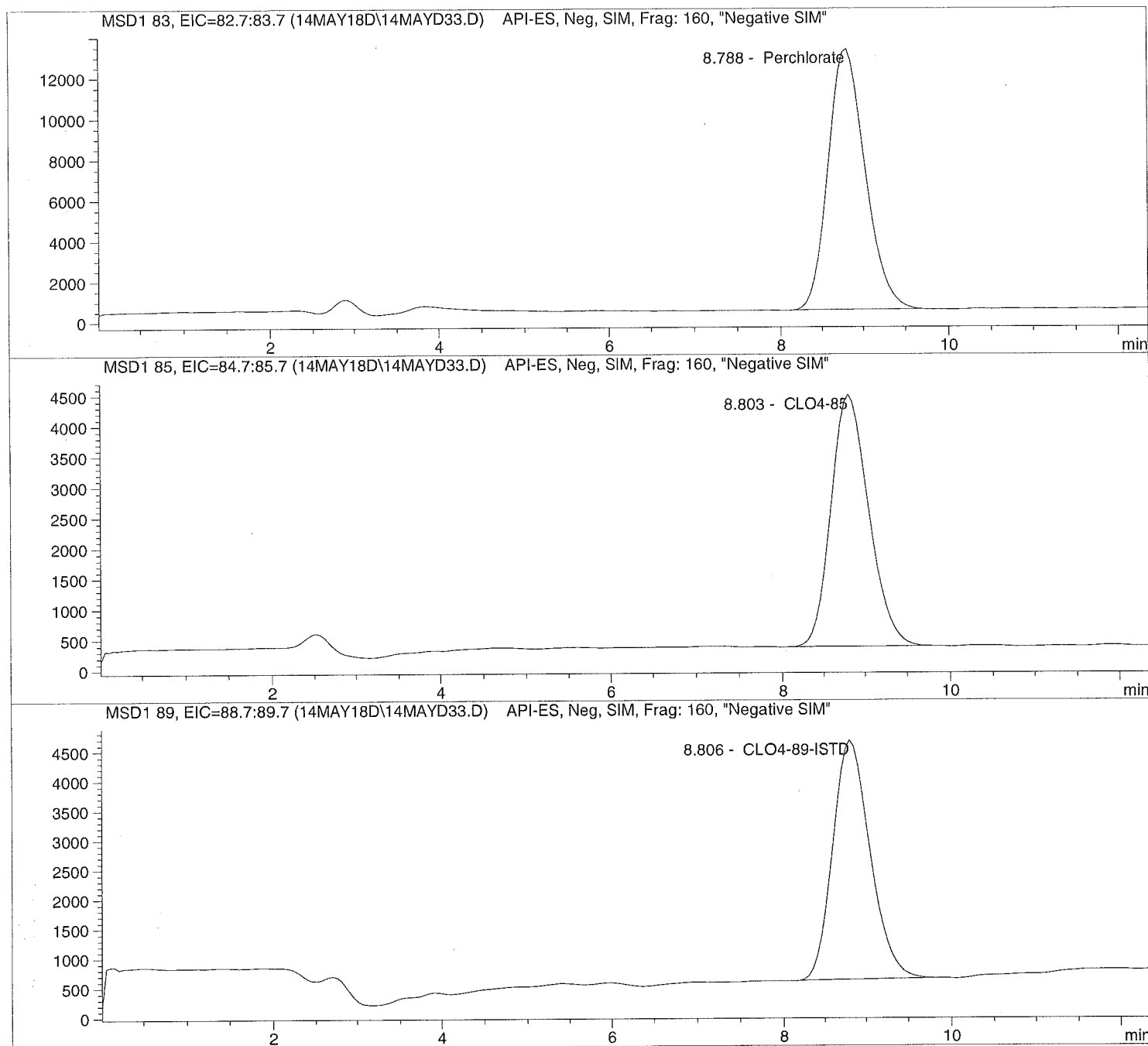
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD33.D

Sample Name: 1813198001 10X

```
=====
Injection Date:  5/14/2018  17:00:17      Seq Line:           33
Sample Name:    1813198001   10X          Location:          Vial 97
Acq Operator:   TNB              Inj. No.:             1
                                      Inj. Vol.:           25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.788	PBA	400251.2	137.6189	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.803	PBA	130819.9	141.7825	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.806	PBA	126622.1	50.0000	CLO4-89-ISTD

*** End of Report ***

Injection Date: 5/14/2018 17:28:42

Seq Line: 35

Sample Name: 1813198003 MSD

Location: Vial 99

Acq Operator: TNB

Inj. No.: 1

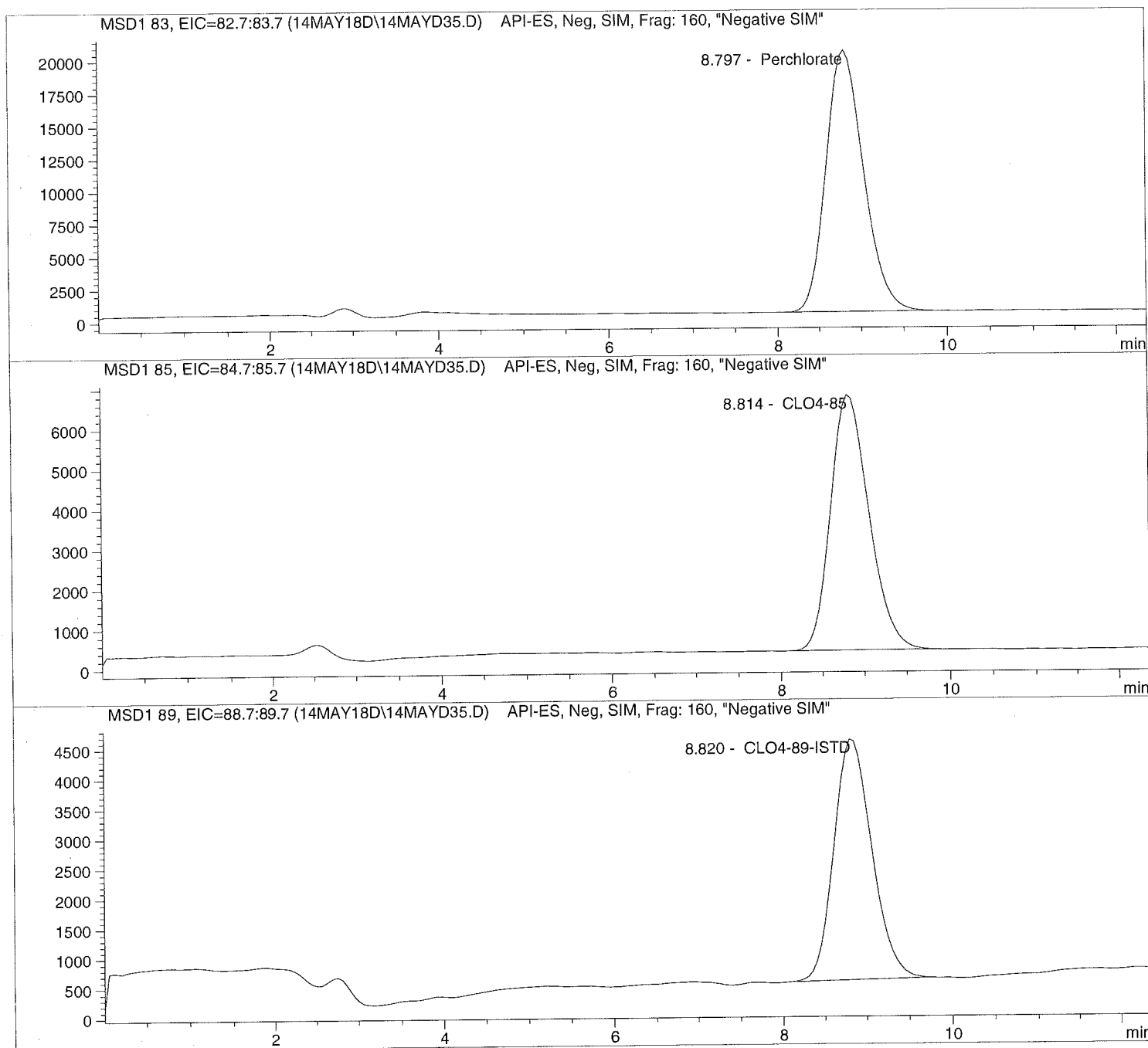
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  5/14/2018  17:28:42      Seq Line:           35
Sample Name:    1813198003   MSD          Location:          Vial 99
Acq Operator:   TNB          Inj. No.:            1
                                      Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.797	PBA	627182.1	206.9223	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.814	BBA	203448.5	213.8201	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.820	BBA	127010.3	50.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD36.D

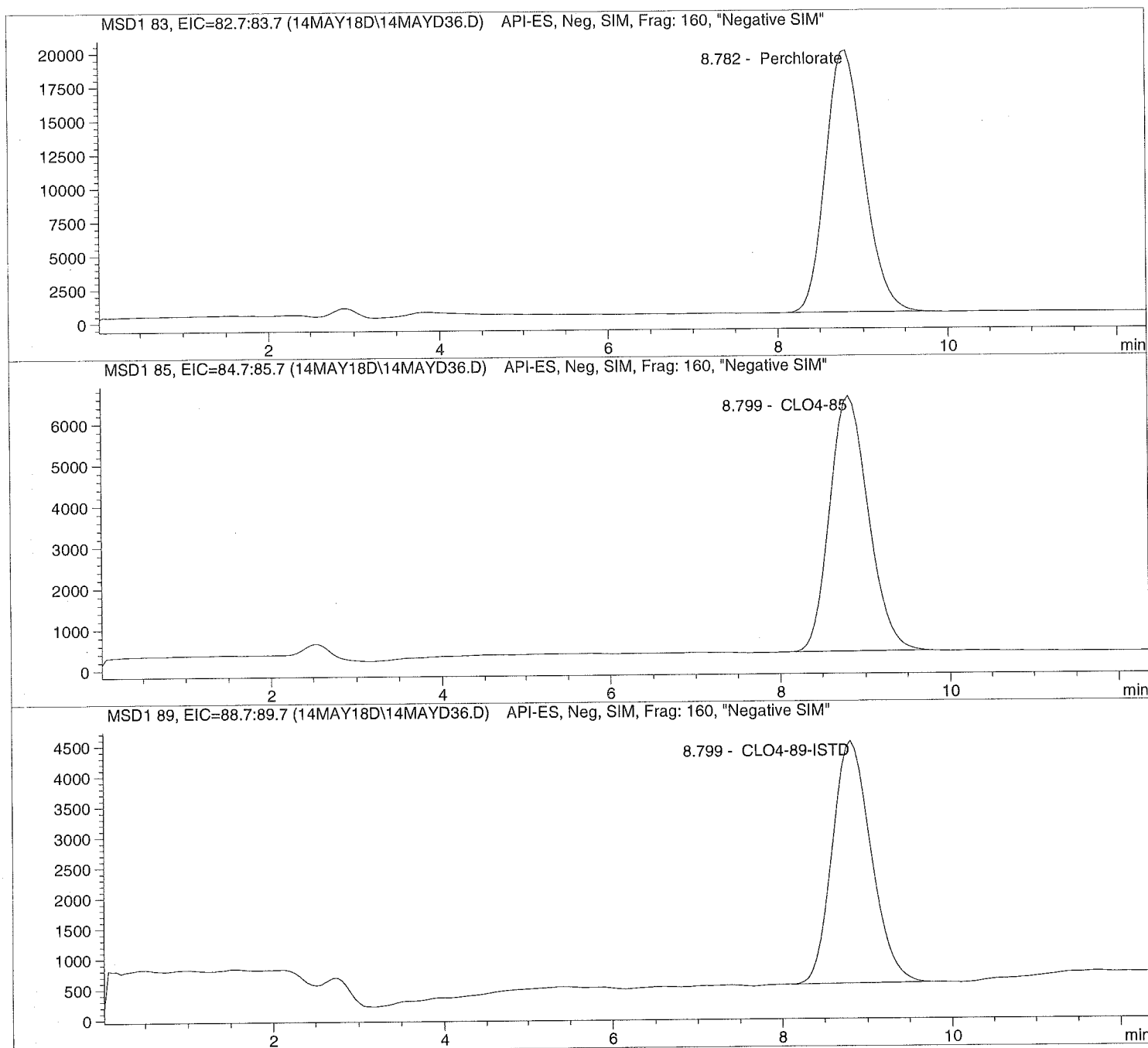
Sample Name: 1813198002 MS

Injection Date: 5/14/2018 17:42:54
Sample Name: 1813198002 MS
Acq Operator: TNB

Seq Line: 36
Location: Vial 98
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD36.D

Sample Name: 1813198002 MS

```
=====
Injection Date:  5/14/2018  17:42:54      Seq Line:          36
Sample Name:    1813198002    MS          Location:         Vial 98
Acq Operator:   TNB           Inj. No.:           1
                                      Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.782	PBA	604797.8	201.8743	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.799	BBA	194863.6	207.1697	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.799	BBA	125886.7	50.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD37.D

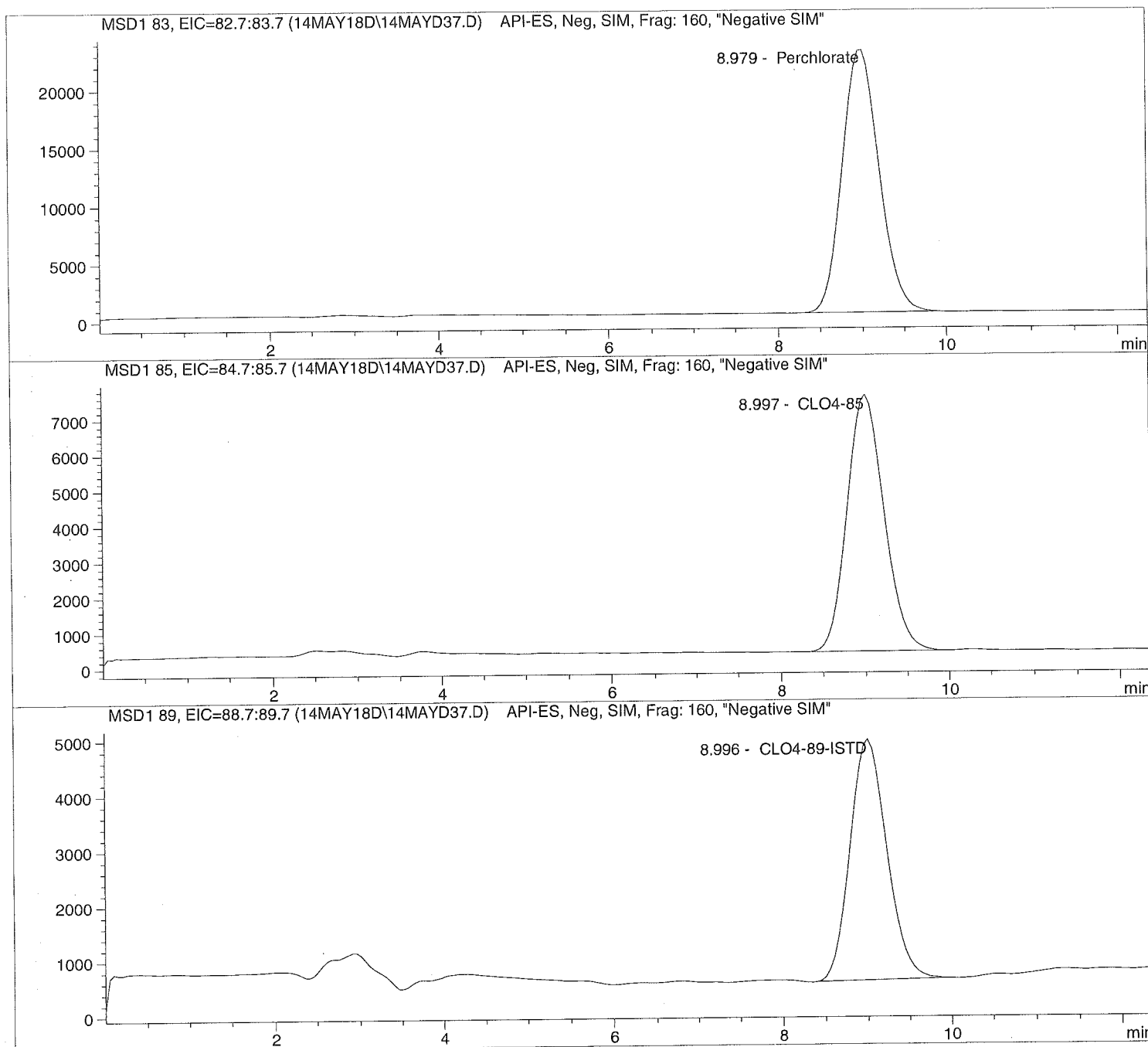
Sample Name: 1813197006 10X

Injection Date: 5/14/2018 17:57:06
Sample Name: 1813197006 10X
Acq Operator: TNB

Seq Line: 37
Location: Vial 64
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis




```
=====
Injection Date:  5/14/2018  17:57:06      Seq Line:           37
Sample Name:    1813197006   10X          Location:           Vial 64
Acq Operator:   TNB              Inj. No.:             1
                                      Inj. Vol.:           25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       10.000000
Sample Amount:  0.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.979	PBA	692197.1	217.2330	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.997	PBA	220927.5	221.4390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.996	PBA	132775.1	50.0000	CLO4-89-ISTD

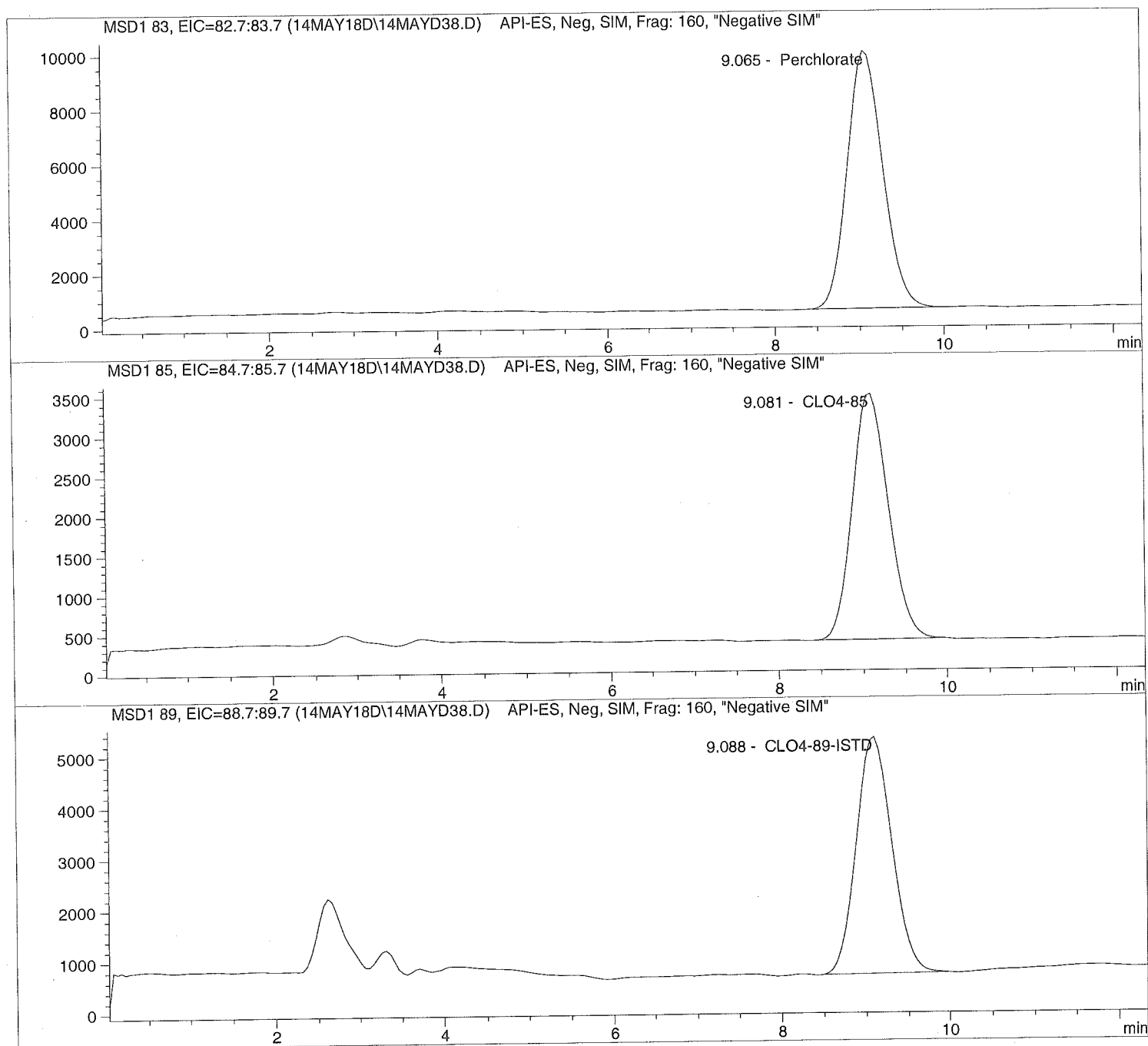
=====
*** End of Report ***
=====

Injection Date: 5/14/2018 18:11:19
Sample Name: 1813198004 10K
Acq Operator: TNB

Seq Line: 38
Location: Vial 65
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD38.D Sample Name: 1813198004 10K

=====

Injection Date:	5/14/2018 18:11:19	Seq Line:	38
Sample Name:	1813198004 10K	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	25 µl

=====

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

=====

Sample Information

=====

Sorted By:	Signal
Calib. Data Modified:	Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

=====

=====

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.065	PBA	275522.2	91359.2052	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.081	PBA	91974.2	95157.6481	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.088	PBA	134685.2	50000.0000	CLO4-89-ISTD

=====

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD39.D

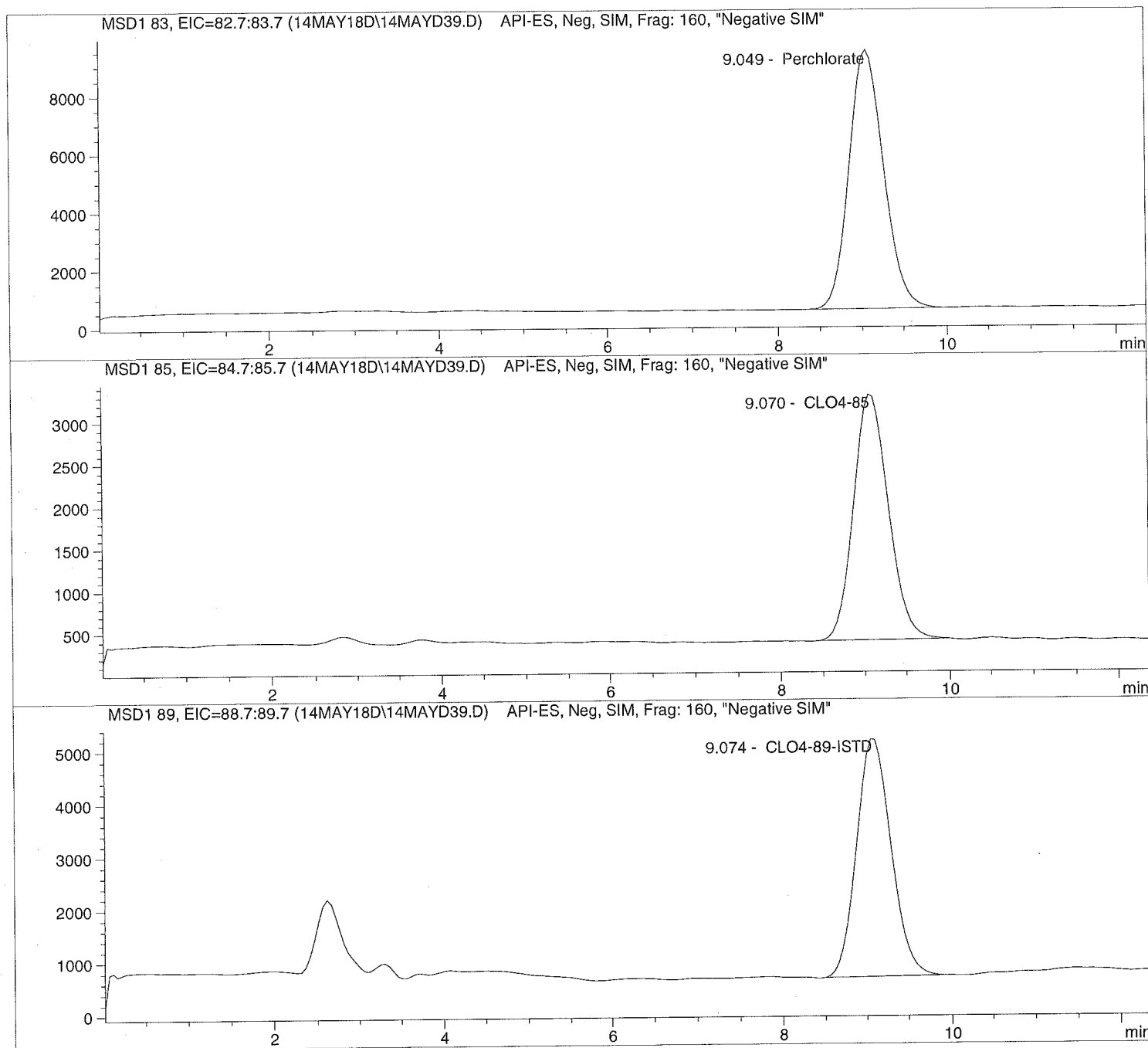
Sample Name: 1813198005 10K

Injection Date: 5/14/2018 18:25:29
Sample Name: 1813198005 10K
Acq Operator: TNB

Seq Line: 39
Location: Vial 66
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD39.D

Sample Name: 1813198005 10K

```
=====
Injection Date:  5/14/2018  18:25:29      Seq Line:          39
Sample Name:    1813198005  10K          Location:         Vial 66
Acq Operator:   TNB                      Inj. No.:           1
                                           Inj. Vol.:         25 µl
=====
```

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

=====

Sample Information

=====

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 10000.000000
Sample Amount: 0.000

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.049	BBA	262390.8	88986.3387	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.070	PBA	85876.0	90858.7173	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.074	PBA	131855.0	50000.0000	CLO4-89-ISTD

=====

*** End of Report ***

Injection Date: 5/14/2018 18:39:41

Seq Line: 40

Sample Name: 600744 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

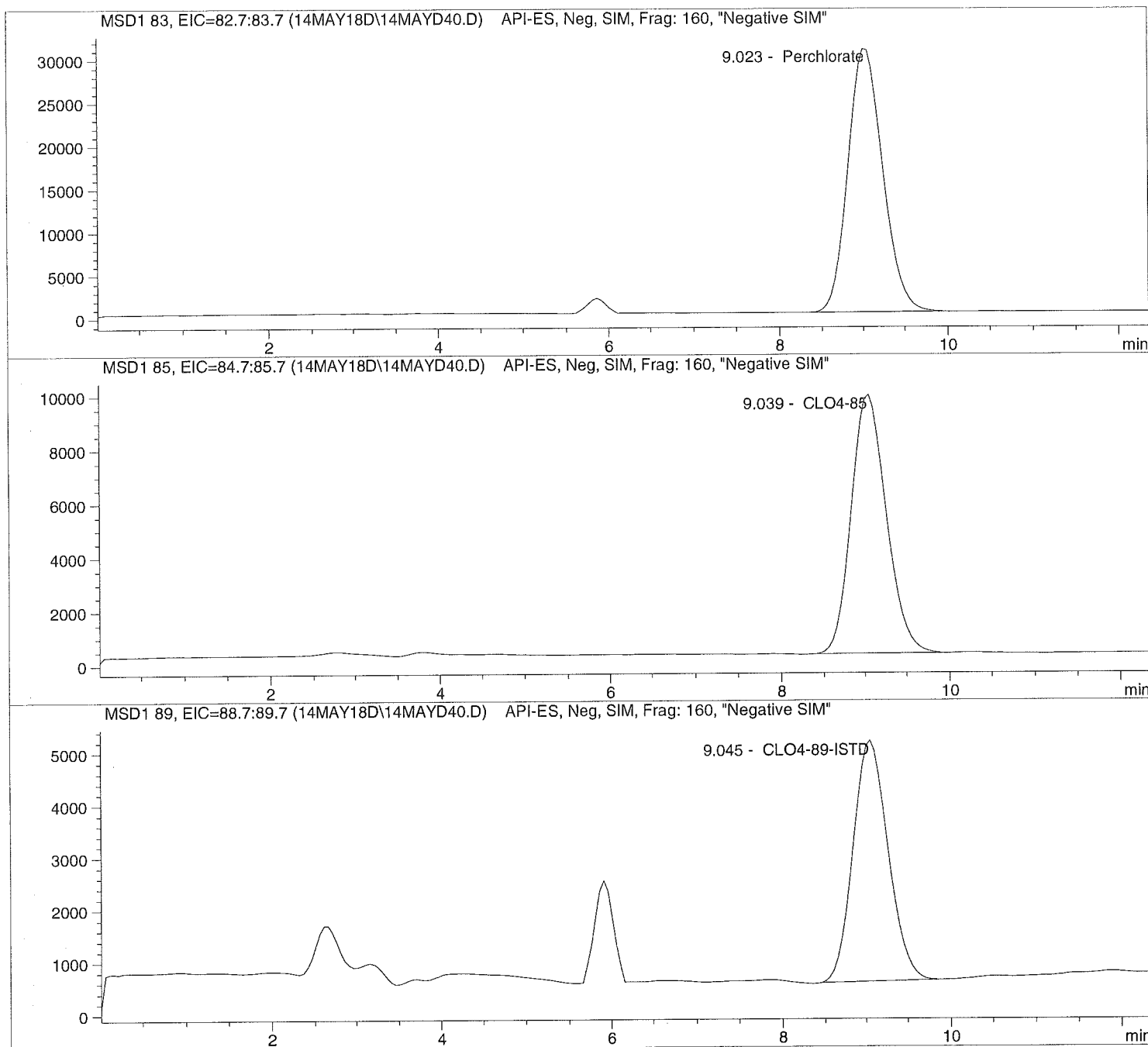
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD40.D

Sample Name: 600744 CCV@25

```
=====
Injection Date:  5/14/2018  18:39:41      Seq Line:           40
Sample Name:    600744   CCV@25          Location:          Vial 71
Acq Operator:   TNB                      Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  25.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.023	PBA	902530.6	26.9154	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.039	PBA	284795.7	27.3236	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.045	PBA	135877.0	5.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD41.D

Sample Name: 600745 LODV@1.

Injection Date: 5/14/2018 18:53:49

Seq Line: 41

Sample Name: 600745 LODV@1.

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

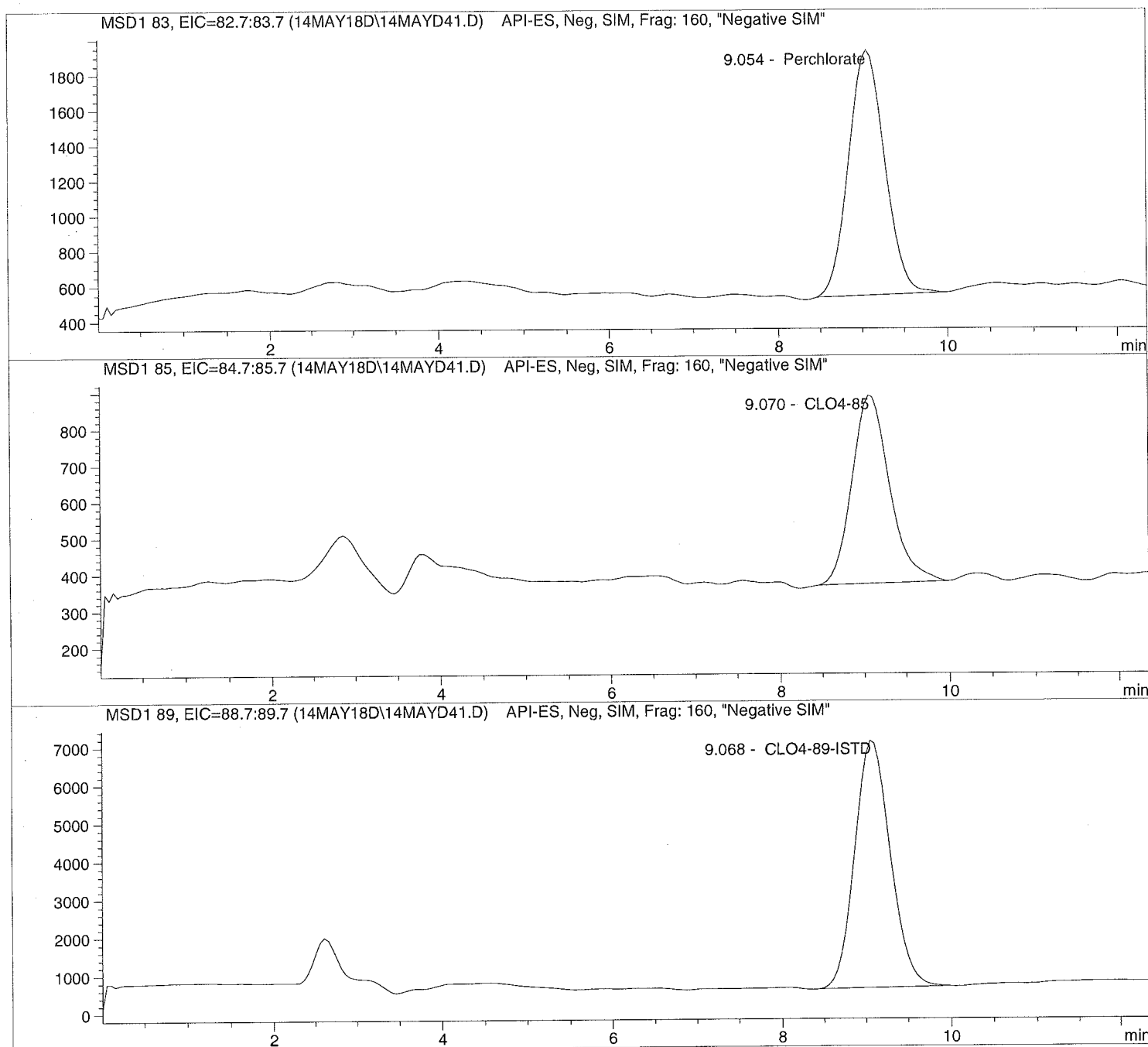
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD41.D Sample Name: 600745 LODV@1.

Injection Date: 5/14/2018 18:53:49 Seq Line: 41
Sample Name: 600745 LODV@1. Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	PBA	41822.6	0.9777	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.070	PBA	16265.8	1.0757	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.068	PBA	192745.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2018\MAY\14MAY18D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	600642	CCV@25	CLO4-DOD	1	Ctrl Samp	
2	Vial 72	600643	LODV@1.	CLO4-DOD	1	Ctrl Samp	
3	Vial 73	600644	ICS@1.0	CLO4-DOD	1	Ctrl Samp	
4	Vial 74	600645	LMB	CLO4-DOD	1	Ctrl Samp	
5	Vial 75	600646	QC@5	CLO4-DOD	1	Ctrl Samp	
6	Vial 76	1812807001		CLO4-DOD	1	Sample	
7	Vial 77	1813193001		CLO4-DOD	1	Sample	
8	Vial 78	1813195001		CLO4-DOD	1	Sample	
9	Vial 79	1813195002		CLO4-DOD	1	Sample	
10	Vial 80	1813195003	1K	CLO4-DOD	1	Sample	
11	Vial 81	1813195004		CLO4-DOD	1	Sample	
12	Vial 82	1813195005	1K	CLO4-DOD	1	Sample	
13	Vial 83	1813197001		CLO4-DOD	1	Sample	
14	Vial 84	1813197002		CLO4-DOD	1	Sample	
15	Vial 85	1813197003		CLO4-DOD	1	Sample	
16	Vial 71	600647	CCV@25	CLO4-DOD	1	Ctrl Samp	
17	Vial 72	600648	LODV@1.	CLO4-DOD	1	Ctrl Samp	
18	Vial 86	1813197004		CLO4-DOD	1	Sample	
19	Vial 87	1813197005		CLO4-DOD	1	Sample	
20	Vial 88	1813197006	10K	CLO4-DOD	1	Sample	
21	Vial 89	1813198001		CLO4-DOD	1	Sample	
22	Vial 90	1813198002	MS	CLO4-DOD	1	Sample	
23	Vial 92	1813198004		CLO4-DOD	1	Sample	
24	Vial 93	1813198005		CLO4-DOD	1	Sample	
25	Vial 61	Rinse		CLO4-DOD	1	Sample	
26	Vial 94	1813197006		CLO4-DOD	1	Sample	
27	Vial 95	1813195003	100	CLO4-DOD	1	Sample	
28	Vial 96	1813195005	100	CLO4-DOD	1	Sample	
29	Vial 71	600649	CCV@25	CLO4-DOD	1	Ctrl Samp	
30	Vial 72	600650	LODV@1.	CLO4-DOD	1	Ctrl Samp	
31	Vial 62	1813198004	1K	CLO4-DOD	1	Sample	
32	Vial 63	1813198005	1K	CLO4-DOD	1	Sample	
33	Vial 97	1813198001	10X	CLO4-DOD	1	Sample	
34	Vial 98	1813198002	MS	CLO4-DOD	1	Sample	
35	Vial 99	1813198003	MSD	CLO4-DOD	1	Sample	
36	Vial 98	1813198002	MS	CLO4-DOD	1	Sample	
37	Vial 64	1813197006	10X	CLO4-DOD	1	Sample	
38	Vial 65	1813198004	10K	CLO4-DOD	1	Sample	
39	Vial 66	1813198005	10K	CLO4-DOD	1	Sample	
40	Vial 71	600744	CCV@25	CLO4-DOD	1	Ctrl Samp	
41	Vial 72	600745	LODV@1.	CLO4-DOD	1	Ctrl Samp	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.M

['#' ==> Run has not been reprocessed with Batch Review Method
 '*' ==> Run has been saved with batch file]

#	*	Sample Location	Inj	SampleType	Run	Perchlorate Area	Perchlorate RT	Perchlorate Amount
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	4.75217e4	8.805	1.04383
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	7.57673e4	8.842	1.88584
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	1.87507e5	8.869	5.06681
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	4.00349e5	8.838	9.89695
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	1.13339e6	8.844	25.44483
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	2.22347e6	8.787	49.47140
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	3.56432e6	8.816	75.20096
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	3.99588e5	8.826	10.16984

#	*	Sample Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	1.48071e4	8.787	8.93940e-1
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	2.78914e4	8.863	2.05665
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	6.40466e4	8.880	5.32040
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	1.32002e5	8.855	10.20400
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	3.49808e5	8.856	25.27336
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	6.58628e5	8.801	48.60374
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	1.06294e6	8.833	75.70015
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	1.27530e5	8.845	10.16575

#	*	Sample Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount
*	ICAL1@ 1.0ug/L	Vial 71	1	Control	1	2.05633e5	8.818	5.00000
*	ICAL2@ 2.0ug/L	Vial 72	1	Control	2	1.83981e5	8.862	5.00000
*	ICAL3@ 5.0ug/L	Vial 73	1	Control	3	1.68695e5	8.888	5.00000
*	ICAL4@ 10.ug/L	Vial 74	1	Control	4	1.79911e5	8.861	5.00000
*	ICAL5@ 25.ug/L	Vial 75	1	Control	5	1.81917e5	8.865	5.00000
*	ICAL6@ 50.ug/L	Vial 76	1	Control	6	1.62538e5	8.808	5.00000
*	ICAL7@ 75.ug/L	Vial 77	1	Control	7	1.52621e5	8.841	5.00000
*	ICAL Verf@10ug/L	Vial 78	1	Control	8	1.74490e5	8.846	5.00000

*** End of Report ***

```
=====
                        Calibration Table
=====
```

Perchlorate

Calib. Data Modified : 4/2/2018 11:32:41 AM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %

Abs. Reference Window : 0.000 min

Rel. Non-ref. Window : 20.000 %

Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs

Uncalibrated Peaks : not reported

Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)

Origin : Ignored (some peaks differ, see below)

Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:

Average Response : Average all calibrations

Average Retention Time: Floating Average New 75%

Calibration Report Options :

Printout of recalibrations within a sequence:

Calibration Table after Recalibration

Normal Report after Recalibration

If the sequence is done with bracketing:

Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name

#

```
-----|-----|-----
1      5.00000  CLO4-89-ISTD
```

Signal 1: MSD1 83, EIC=82.7:83.7

Signal 2: MSD1 85, EIC=84.7:85.7

Signal 3: MSD1 89, EIC=88.7:89.7

RetTime	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
[min]	Sig						

8.740	1	1	1.00000	4.75217e4	2.10430e-5	1	Perchlorate
		2	2.00000	7.57673e4	2.63966e-5		
		3	5.00000	1.87507e5	2.66656e-5		
		4	10.00000	4.00349e5	2.49782e-5		
		5	25.00000	1.13339e6	2.20577e-5		
		6	50.00000	2.22347e6	2.24874e-5		
		7	75.00000	3.56432e6	2.10419e-5		
8.787	2	1	1.00000	1.48071e4	6.75351e-5	1	CLO4-85
		2	2.00000	2.78914e4	7.17068e-5		
		3	5.00000	6.40466e4	7.80681e-5		
		4	10.00000	1.32002e5	7.57564e-5		
		5	25.00000	3.49808e5	7.14678e-5		
		6	50.00000	6.58628e5	7.59154e-5		
		7	75.00000	1.06294e6	7.05587e-5		
8.818	3	1	5.00000	2.05633e5	2.43151e-5	+I1	CLO4-89-ISTD
		2	5.00000	1.83981e5	2.71766e-5		
		3	5.00000	1.68695e5	2.96393e-5		
		4	5.00000	1.79911e5	2.77915e-5		
		5	5.00000	1.81917e5	2.74851e-5		
		6	5.00000	1.62538e5	3.07621e-5		

Method C:\HPCHEM\1\METHODS\CLO4-DPR.M

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref	Grp	Name
7		5.00000	1.52621e5	3.27608e-5			

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.650 min To 10.650 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/

Level 1	: 1
Level 2	: 0.5
Level 3	: 0.2
Level 4	: 0.1
Level 5	: 0.04
Level 6	: 0.02
Level 7	: 0.013333

Compound: CLO4-85

Time Window : From 6.682 min To 10.682 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/

Level 1	: 1
Level 2	: 0.5
Level 3	: 0.2
Level 4	: 0.1
Level 5	: 0.04
Level 6	: 0.02
Level 7	: 0.013333

Compound: CLO4-89-ISTD

Time Window : From 6.711 min To 10.711 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/

Level 1	: 1
Level 2	: 1
Level 3	: 1
Level 4	: 1
Level 5	: 1
Level 6	: 1
Level 7	: 1

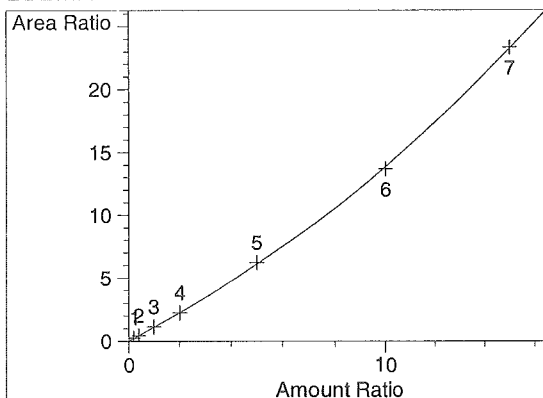
=====

Peak Sum Table

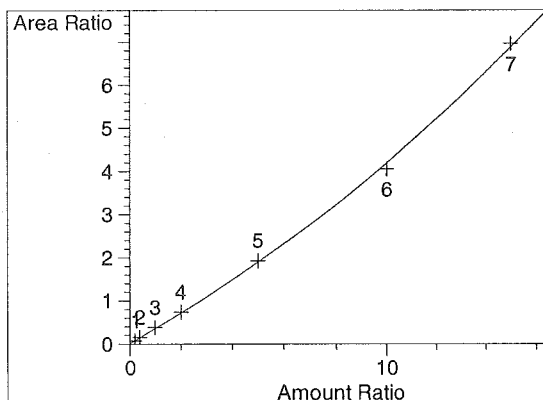
=====

No Entries in table

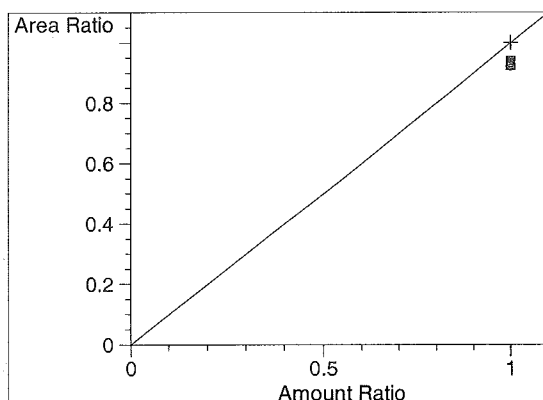
=====

=====
Calibration Curves
=====

Perchlorate at exp. RT: 8.740
MSD1 83, EIC=82.7:83.7
Correlation: 0.99992
Residual Std. Dev.: 0.10616
Formula: $y = ax^2 + bx + c$
a: 3.31374e-2
b: 1.05374
c: 9.66975e-3
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.787
MSD1 85, EIC=84.7:85.7
Correlation: 0.99968
Residual Std. Dev.: 0.07365
Formula: $y = ax^2 + bx + c$
a: 8.04074e-3
b: 3.37521e-1
c: 1.14057e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.818
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Sequence Table:

Method and Injection Info Part:

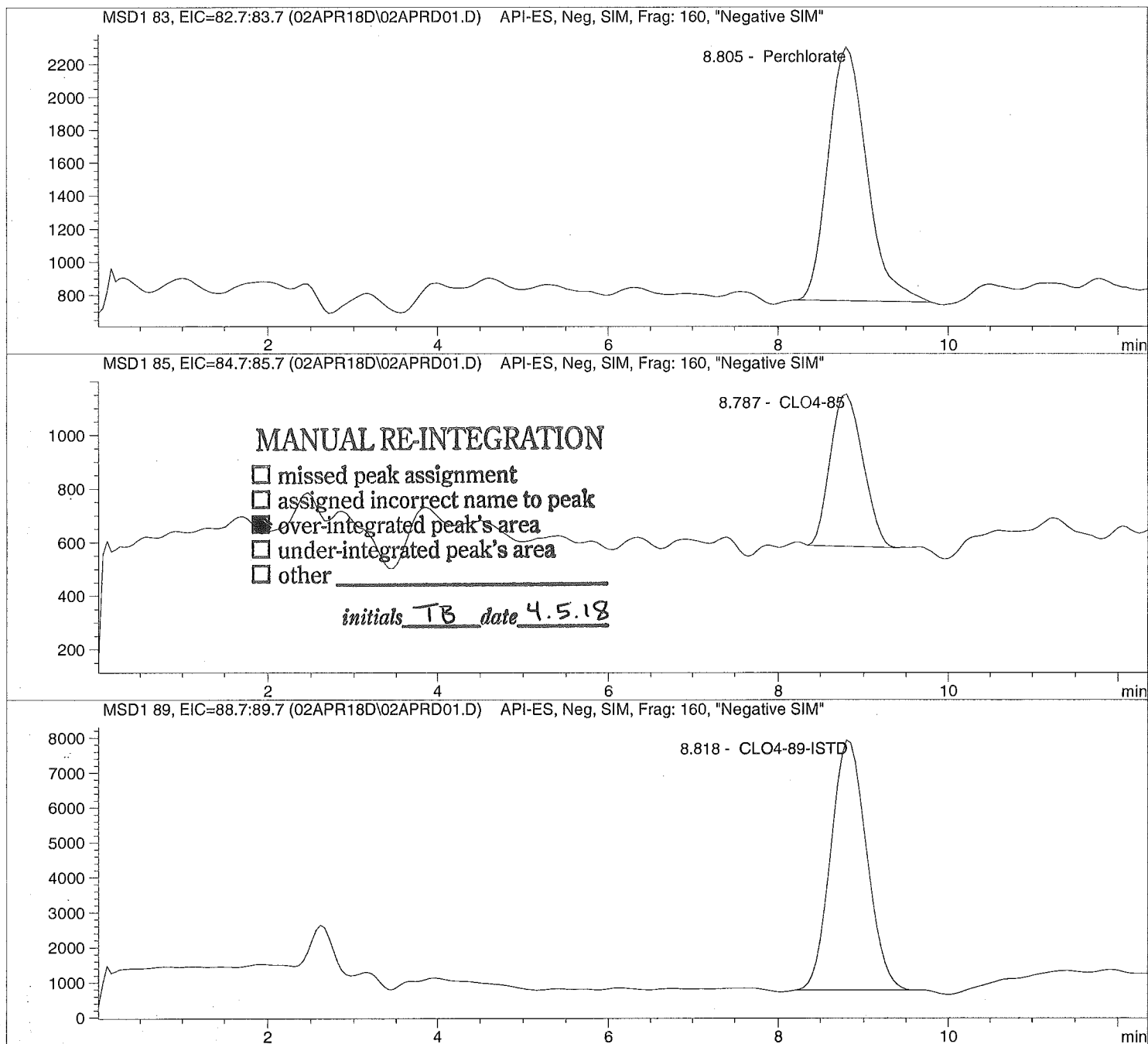
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	ICAL1@ 1.0ug/L	CLO4-DOD	1	Ctrl Samp		
2	Vial 72	ICAL2@ 2.0ug/L	CLO4-DOD	1	Ctrl Samp		
3	Vial 73	ICAL3@ 5.0ug/L	CLO4-DOD	1	Ctrl Samp		
4	Vial 74	ICAL4@ 10.ug/L	CLO4-DOD	1	Ctrl Samp		
5	Vial 75	ICAL5@ 25.ug/L	CLO4-DOD	1	Ctrl Samp		
6	Vial 76	ICAL6@ 50.ug/L	CLO4-DOD	1	Ctrl Samp		
7	Vial 77	ICAL7@ 75.ug/L	CLO4-DOD	1	Ctrl Samp		
8	Vial 78	ICAL Verf@10ug/L	CLO4-DOD	1	Ctrl Samp		

Injection Date: 4/02/2018 09:08:19
Sample Name: ICAL1@ 1.0ug/L
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  09:08:19      Seq Line:          1
Sample Name:    ICAL1@ 1.0ug/L          Location:          Vial 71
Acq Operator:   TNB                     Inj. No.:          1
                                           Inj. Vol.:        25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.805	PBA	47521.7	1.0438	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.787	MM	14807.1	0.8939	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.818	PBA	205633.2	5.0000	CLO4-89-ISTD

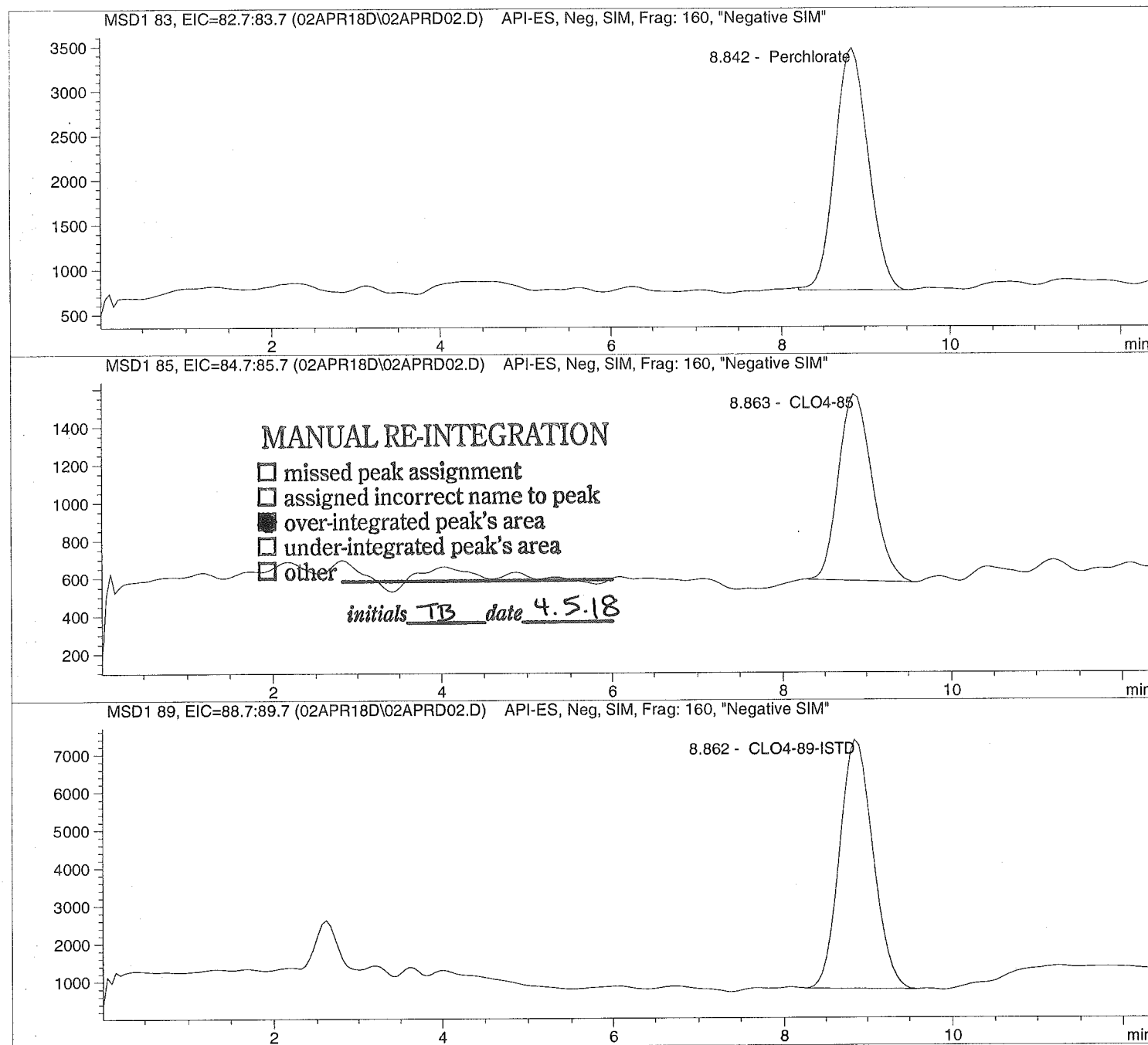
```
=====
*** End of Report ***
=====
```

Injection Date: 4/02/2018 09:22:28
Sample Name: ICAL2@ 2.0ug/L
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  09:22:28      Seq Line:           2
Sample Name:    ICAL2@ 2.0ug/L           Location:           Vial 72
Acq Operator:   TNB                      Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  2.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.842	BBA	75767.3	1.8858	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.863	MM	27891.4	2.0567	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.862	BBA	183981.5	5.0000	CLO4-89-ISTD

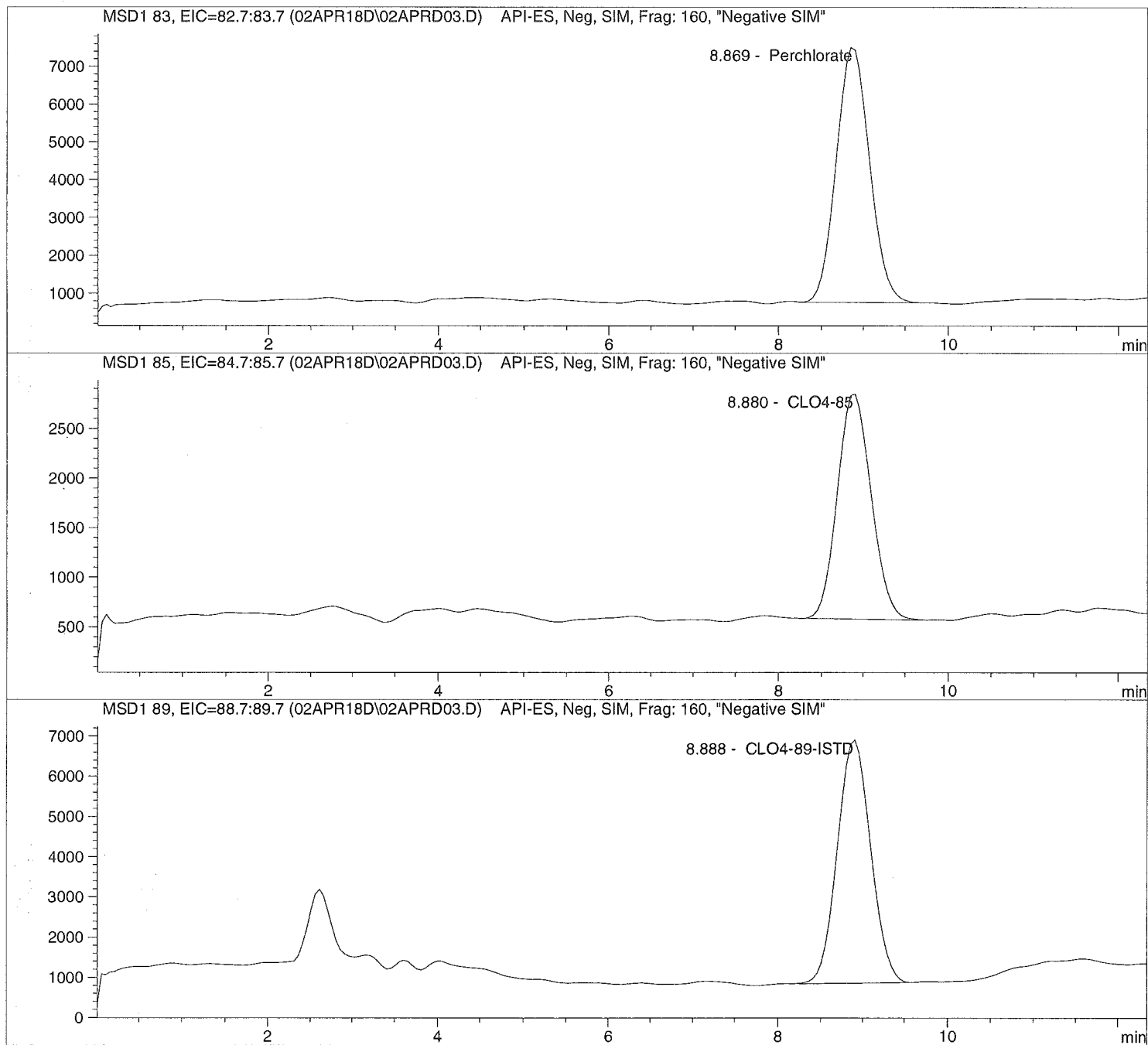
```
=====
*** End of Report ***
=====
```

Injection Date: 4/02/2018 09:36:38
Sample Name: ICAL3@ 5.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  09:36:38      Seq Line:          3
Sample Name:    ICAL3@ 5.0ug/L           Location:          Vial 73
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   5.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.869	BBA	187507.2	5.0668	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.880	PBA	64046.6	5.3204	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.888	BBA	168695.0	5.0000	CLO4-89-ISTD

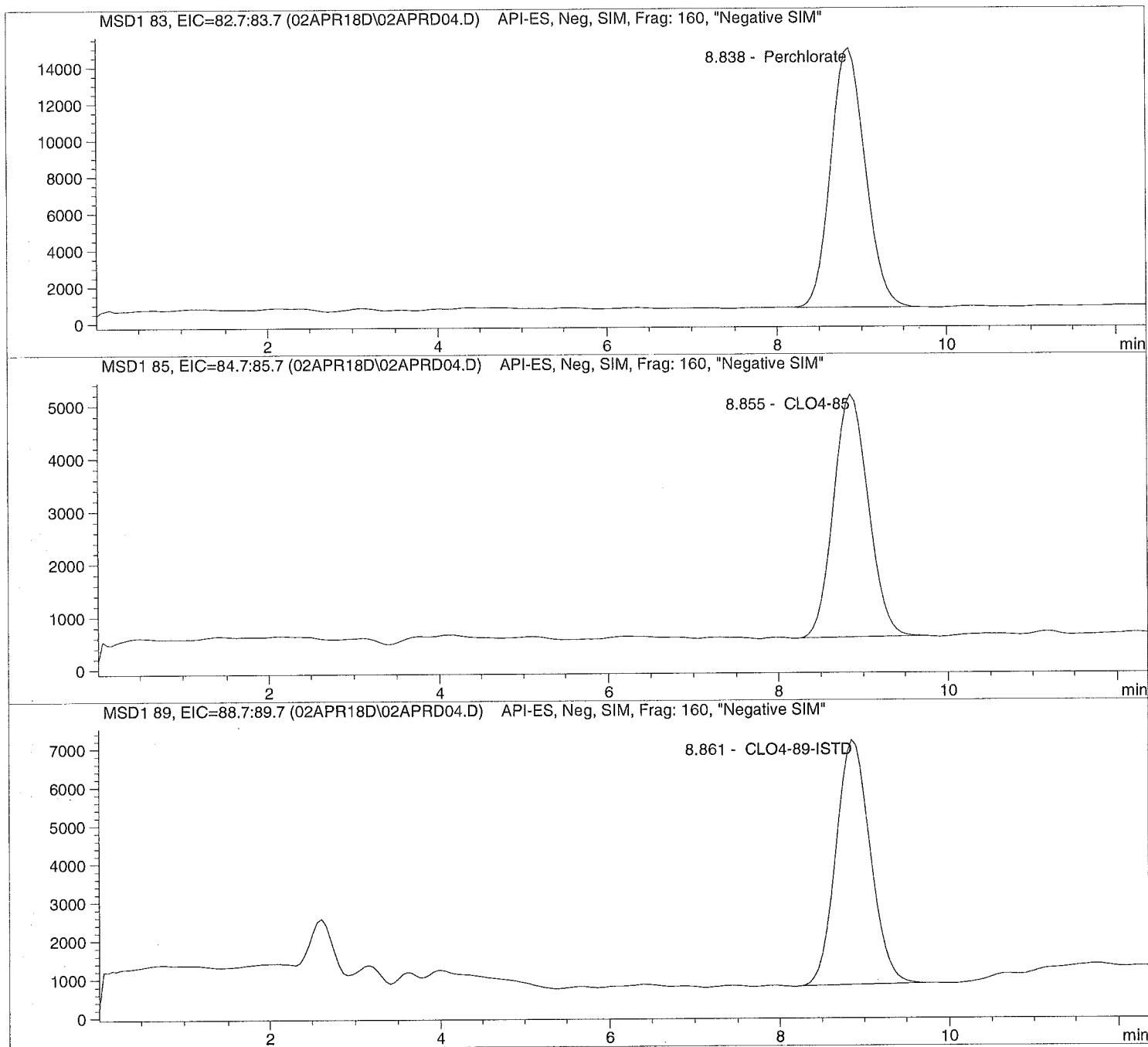
```
=====
*** End of Report ***
=====
```

Injection Date: 4/02/2018 09:50:54
Sample Name: ICAL4@ 10.ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  09:50:54      Seq Line:           4
Sample Name:    ICAL4@ 10.ug/L           Location:           Vial 74
Acq Operator:   TNB                     Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.838	BBA	400349.0	9.8969	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.855	PBA	132002.1	10.2040	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.861	PBA	179911.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```


Injection Date: 4/02/2018 10:05:03

Seq Line: 5

Sample Name: ICAL5@ 25.ug/L

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

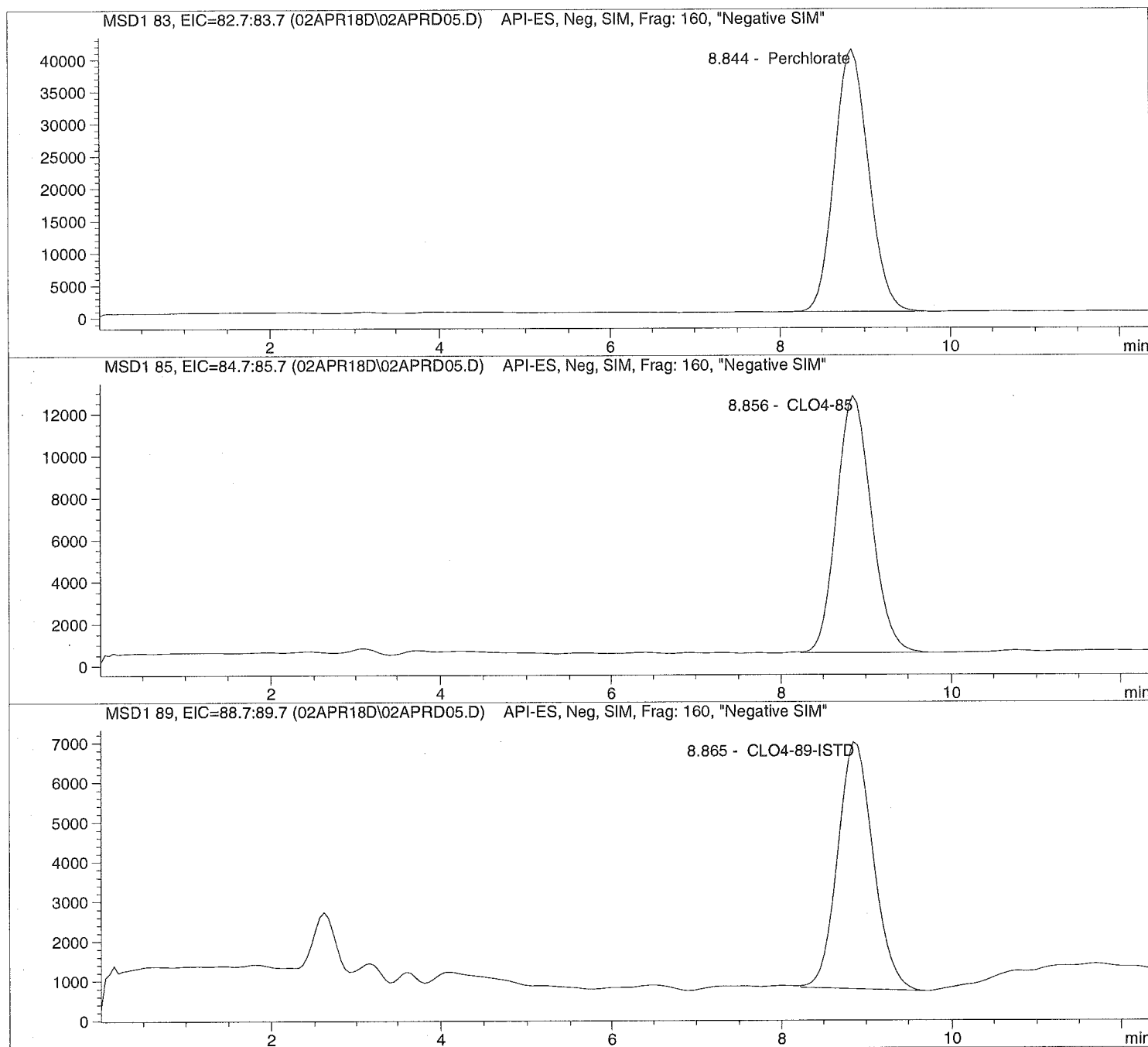
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  10:05:03      Seq Line:           5
Sample Name:     ICAL5@ 25.ug/L          Location:           Vial 75
Acq Operator:    TNB                     Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:     CLO4-DOD.M
Analysis Method:  C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:     4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:        Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:       1.000000
Dilution:         1.000000
Sample Amount:    25.000
=====
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.844	BBA	1133393.5	25.4448	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.856	BBA	349808.1	25.2734	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.865	BBA	181916.8	5.0000	CLO4-89-ISTD

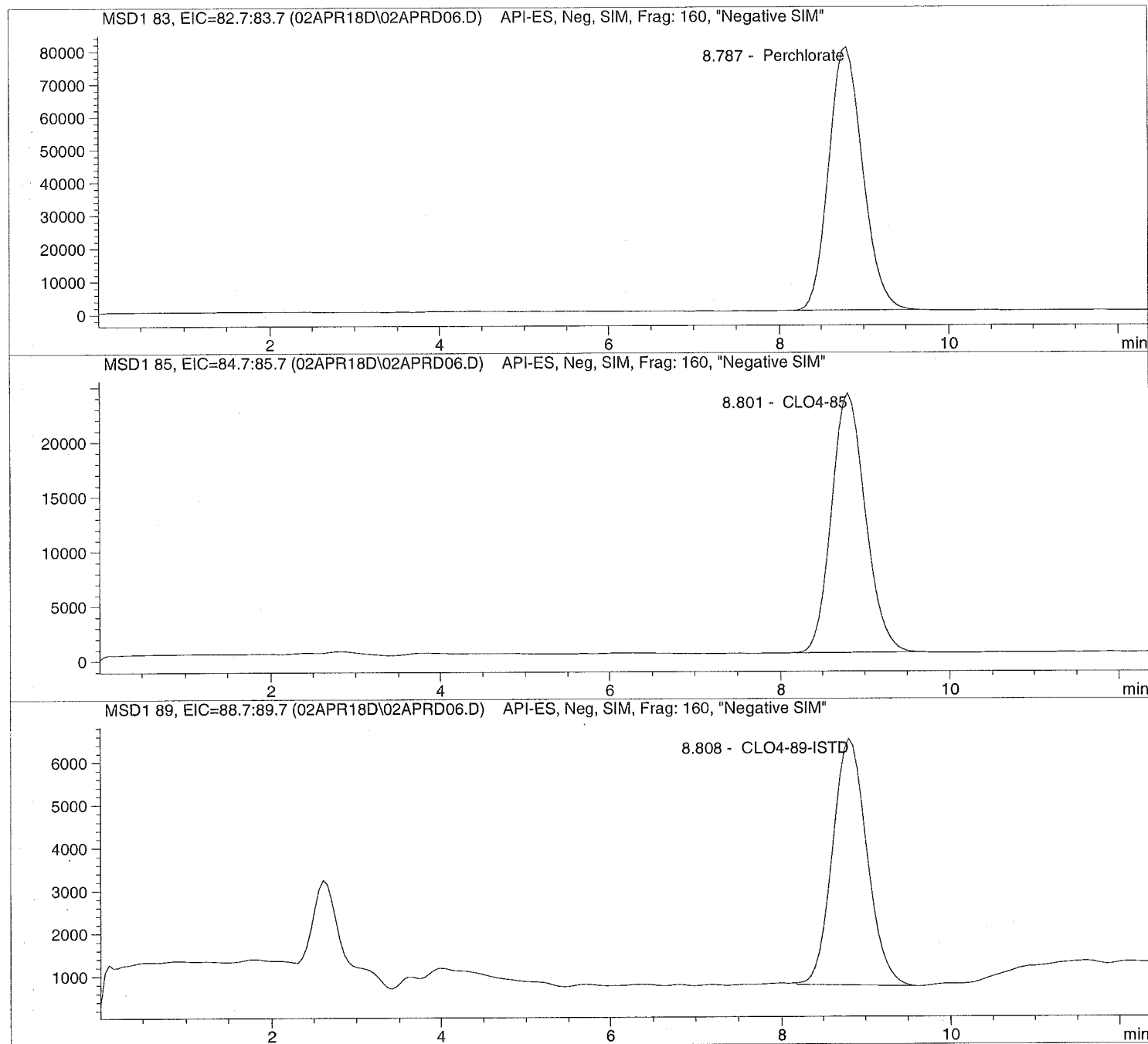
```
=====
*** End of Report ***
=====
```

Injection Date: 4/02/2018 10:19:12
Sample Name: ICAL6@ 50.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  10:19:12      Seq Line:           6
Sample Name:    ICAL6@ 50.ug/L           Location:          Vial 76
Acq Operator:   TNB                      Inj. No.:          1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  50.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.787	BBA	2223467.0	49.4714	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.801	BBA	658628.2	48.6037	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.808	BBA	162537.8	5.0000	CLO4-89-ISTD

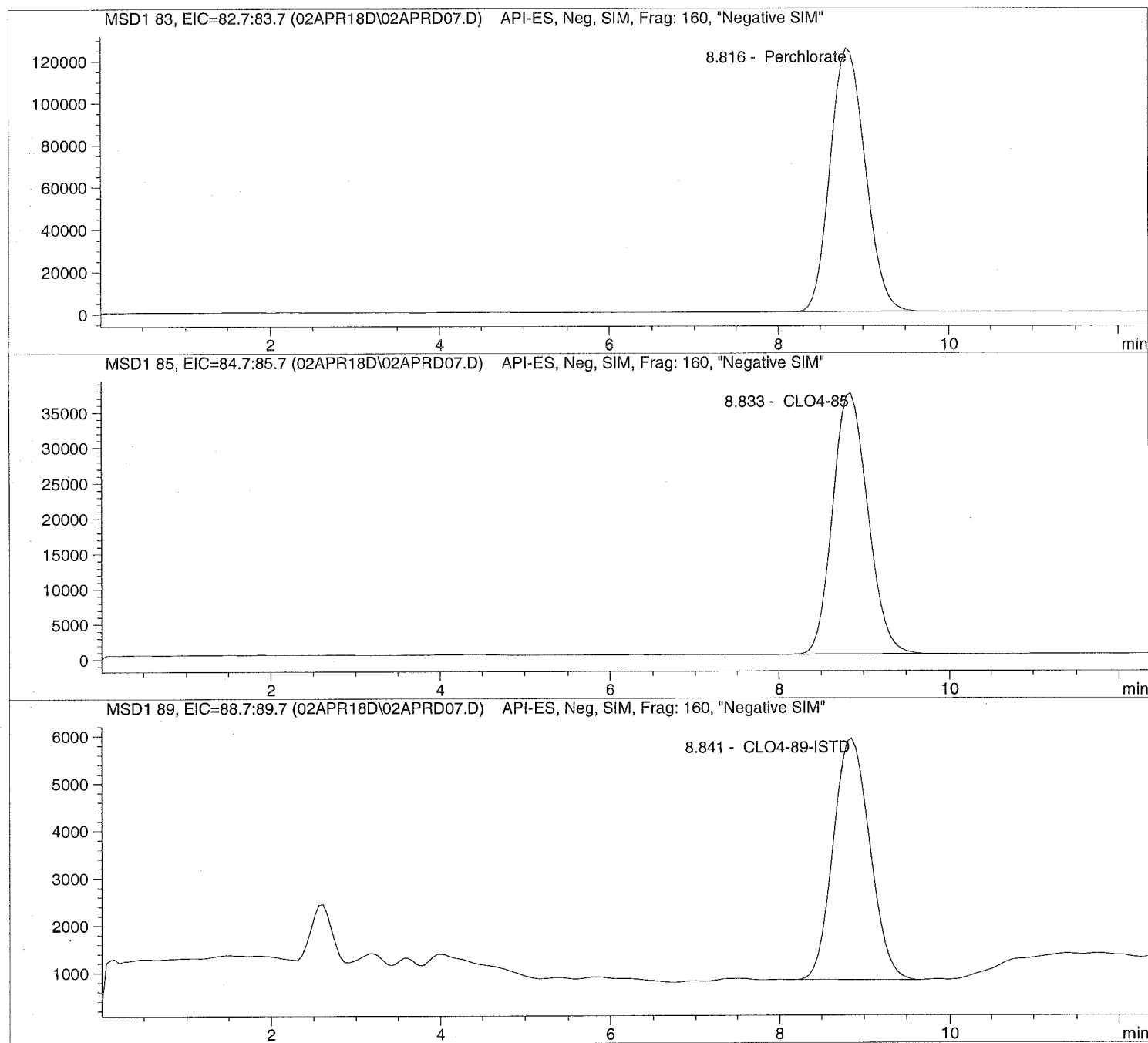
```
=====
*** End of Report ***
=====
```

Injection Date: 4/02/2018 10:33:24
Sample Name: ICAL7@ 75.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  10:33:24      Seq Line:          7
Sample Name:    ICAL7@ 75.ug/L           Location:          Vial 77
Acq Operator:   TNB                      Inj. No.:          1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   75.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.816	PBA	3564322.2	75.2010	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.833	BBA	1062944.2	75.7001	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.841	PBA	152621.4	5.0000	CLO4-89-ISTD

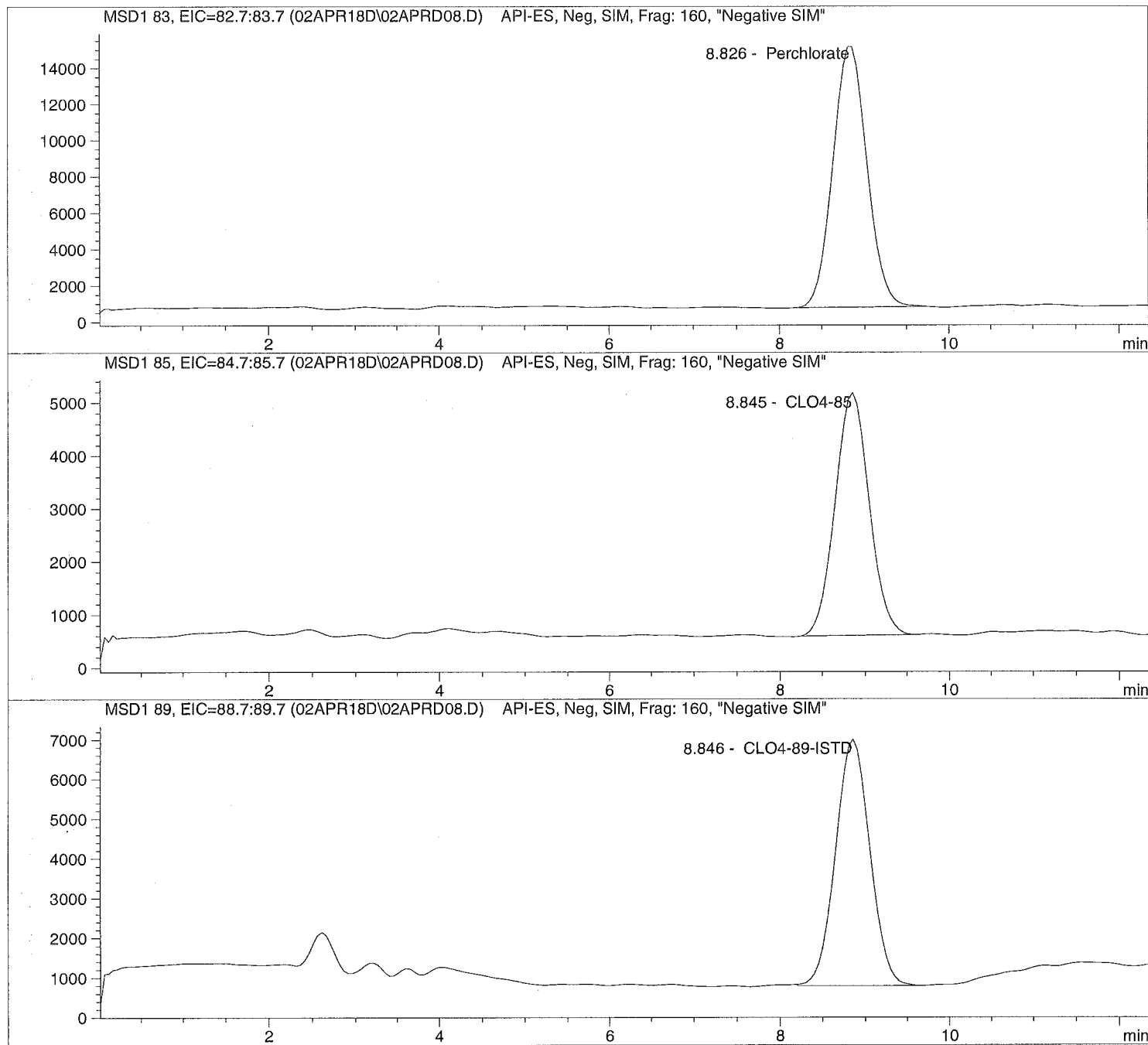
```
=====
*** End of Report ***
=====
```

Injection Date: 4/02/2018 10:47:33
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02APR18D\02APRD08.D

Sample Name: ICAL Verf@10ug/L

```
=====
Injection Date:  4/02/2018  10:47:33      Seq Line:           8
Sample Name:    ICAL Verf@10ug/L         Location:           Vial 78
Acq Operator:   TNB                      Inj. No.:          1
                                           Inj. Vol.:         25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.826	BBA	399587.8	10.1698	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.845	PBA	127530.4	10.1657	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.846	BBA	174490.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```




ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Injection Date: 4/02/2018 09:08:19

Seq Line: 1

Sample Name: ICAL1@ 1.0ug/L

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

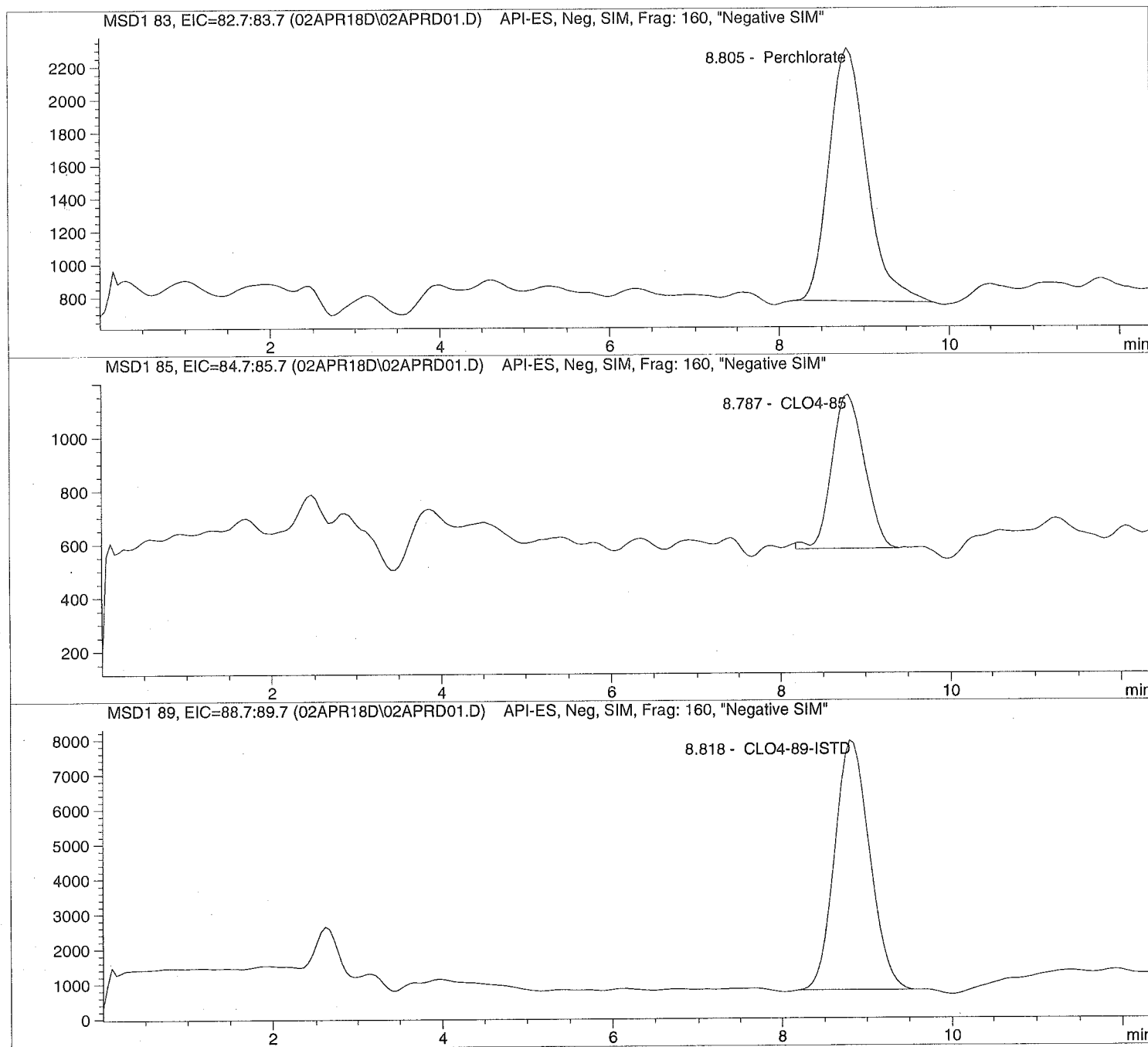
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  4/02/2018  09:08:19      Seq Line:      1
Sample Name:    ICAL1@ 1.0ug/L           Location:      Vial 71
Acq Operator:   TNB                      Inj. No.:      1
                                           Inj. Vol.:    25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   1.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.805	PBA	47521.7	1.0438	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.787	BBA	15364.8	0.9338	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.818	PBA	205633.2	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\02APR18D\02APRD02.D

Sample Name: ICAL2@ 2.0ug/L

Injection Date: 4/02/2018 09:22:28

Seq Line: 2

Sample Name: ICAL2@ 2.0ug/L

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

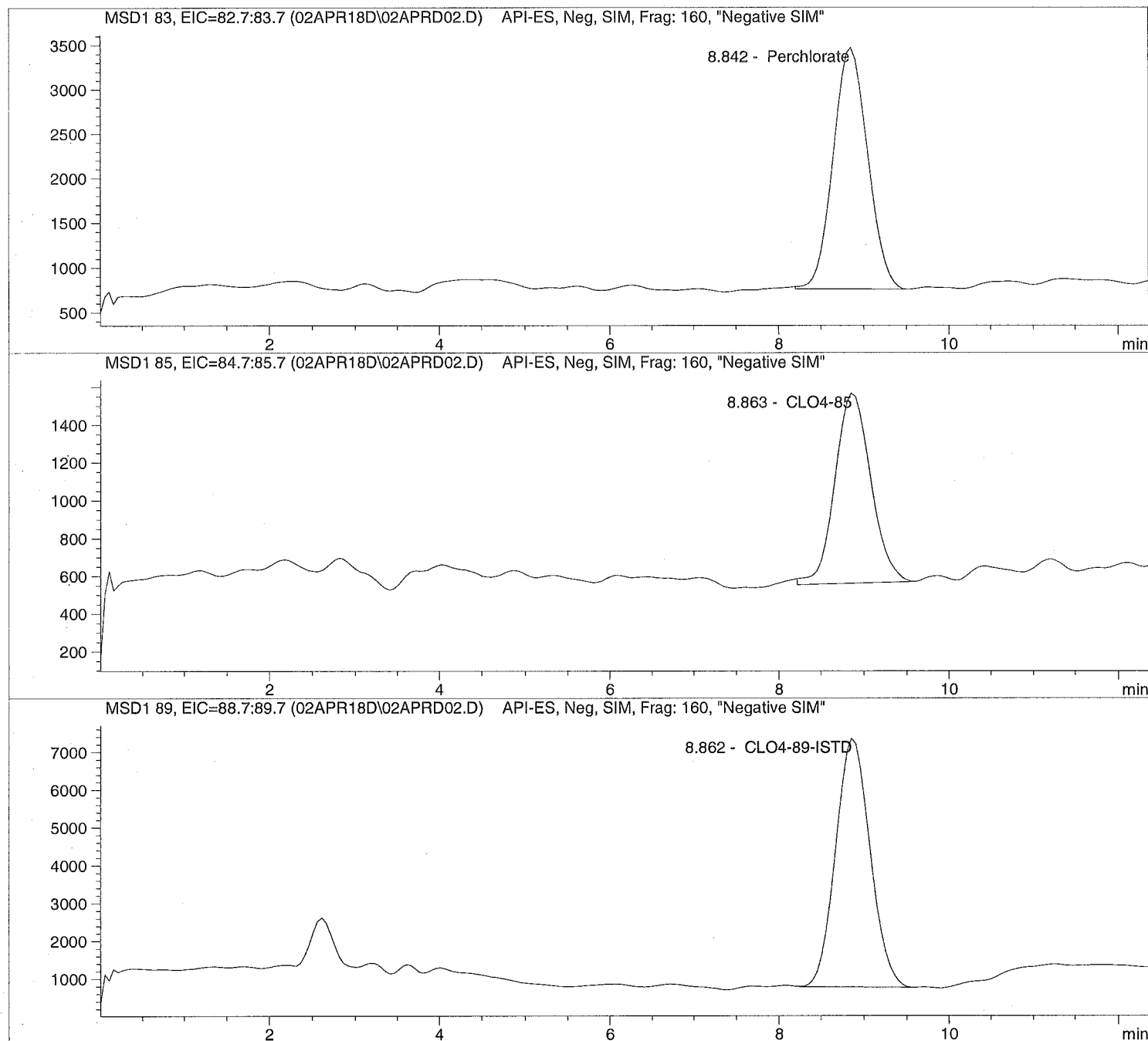
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\02APR18D\02APRD02.D

Sample Name: ICAL2@ 2.0ug/L

```
=====
Injection Date:  4/02/2018  09:22:28      Seq Line:           2
Sample Name:     ICAL2@ 2.0ug/L           Location:           Vial 72
Acq Operator:    TNB                      Inj. No.:           1
                                           Inj. Vol.:          25 µl
=====
```

```
Acq. Method:     CLO4-DOD.M
Analysis Method:  C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:     4/2/2018   11:32:43
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:       Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:      1.000000
Dilution:        1.000000
Sample Amount:    2.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.842	BBA	75767.3	1.8858	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.863	BBA	29265.6	2.1651	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.862	BBA	183981.5	5.0000	CLO4-89-ISTD

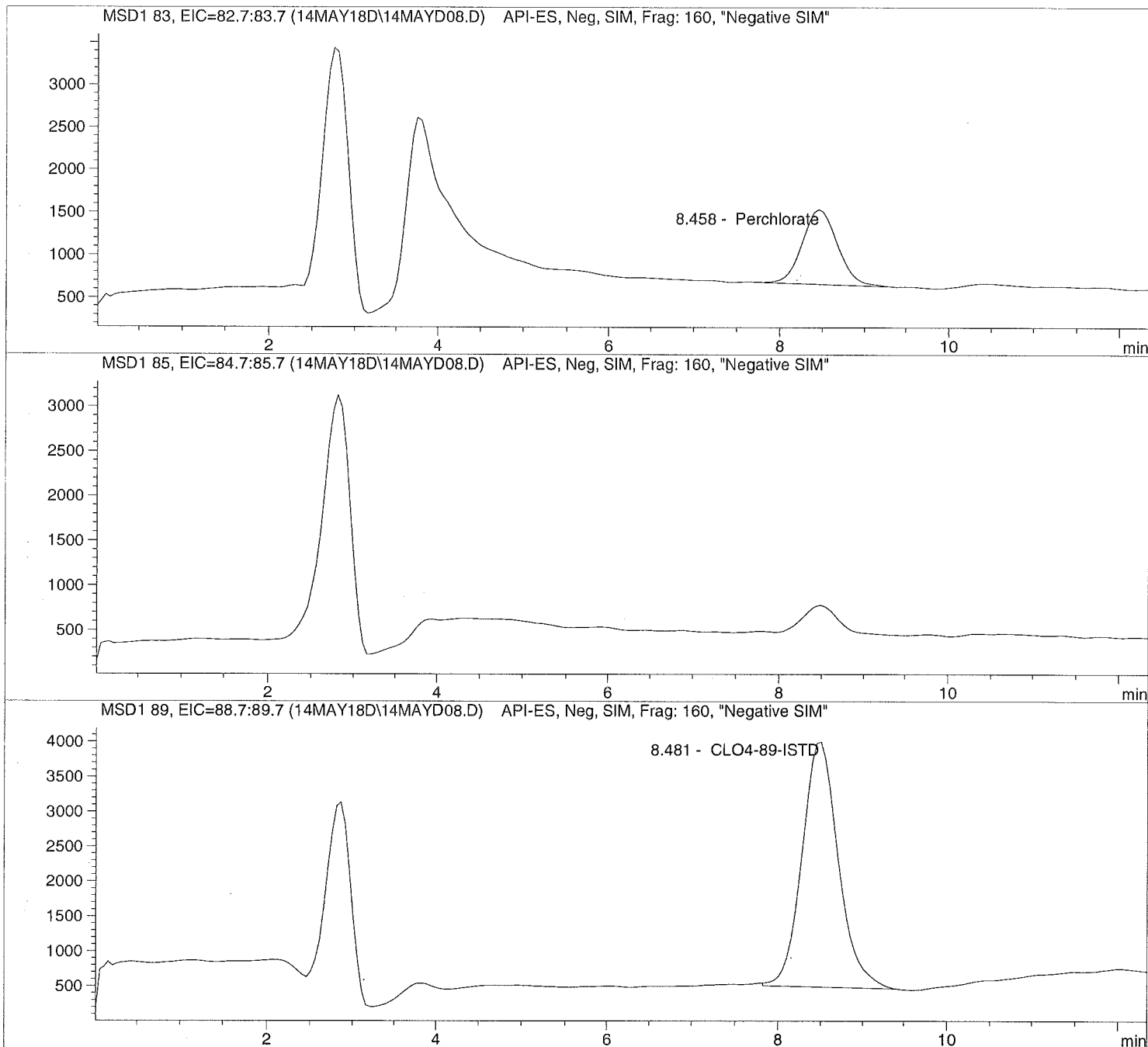
```
=====
*** End of Report ***
=====
```

Injection Date: 5/14/2018 11:01:22
Sample Name: 1813195001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



```
=====
Injection Date:  5/14/2018  11:01:22      Seq Line:           8
Sample Name:    1813195001      Location:          Vial 78
Acq Operator:   TNB             Inj. No.:           1
                                   Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.458	BBA	25188.4	1.0927	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.481	BBA	104283.8	5.0000	CLO4-89-ISTD

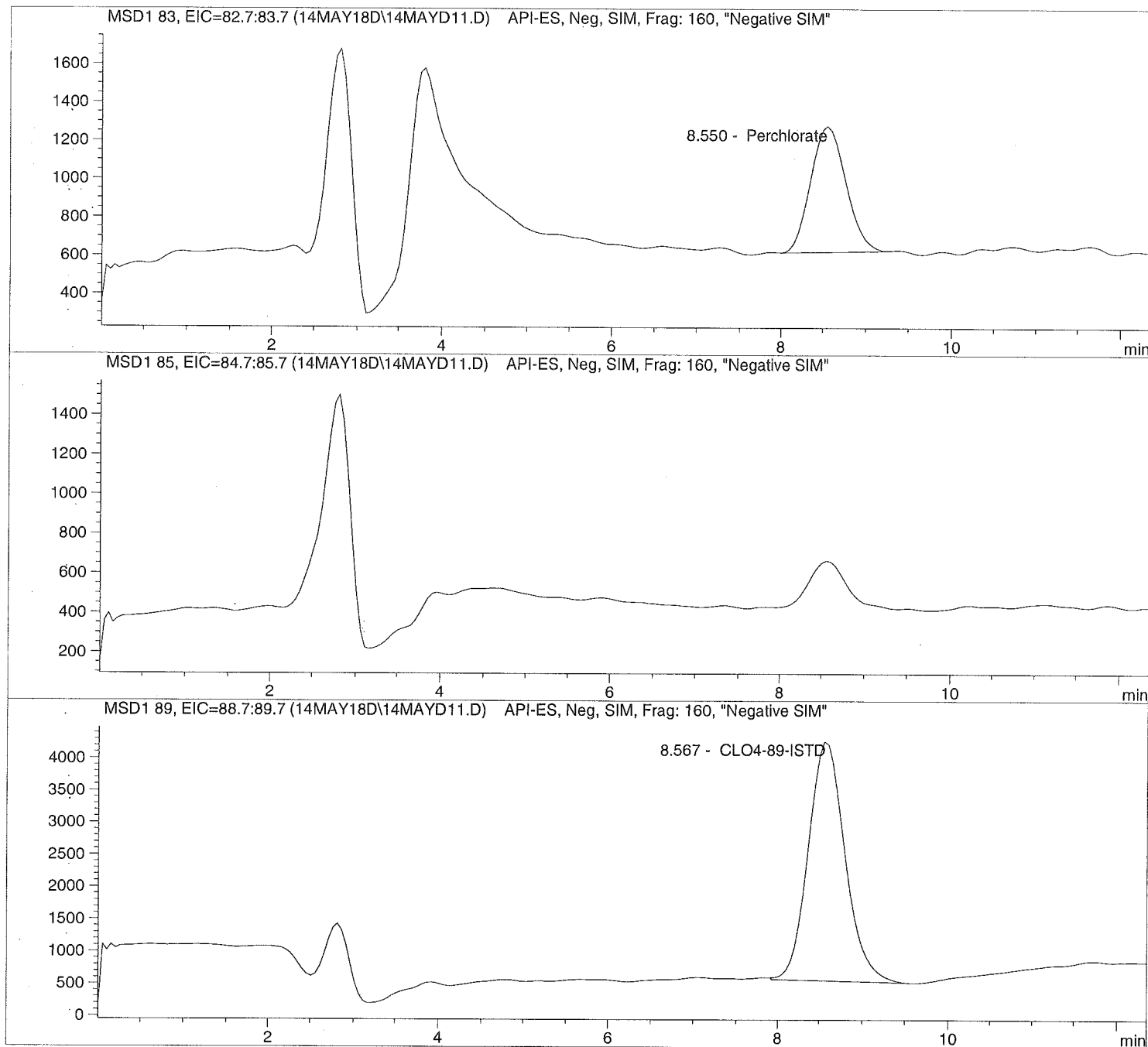
```
=====
*** End of Report ***
=====
```

Injection Date: 5/14/2018 11:43:58
Sample Name: 1813195004
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis




```
=====
Injection Date:  5/14/2018  11:43:58      Seq Line:           11
Sample Name:    1813195004      Location:           Vial 81
Acq Operator:   TNB             Inj. No.:           1
                                      Inj. Vol.:          25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:    4/2/2018   11:32:43
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
```

```
=====
                          LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.550	PBA	18621.2	0.7476	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.567	BBA	110863.1	5.0000	CLO4-89-ISTD

```
=====
*** End of Report ***
=====
```

Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD23.D

Sample Name: 1813198004

Injection Date: 5/14/2018 14:36:12

Seq Line: 23

Sample Name: 1813198004

Location: Vial 92

Acq Operator: TNB

Inj. No.: 1

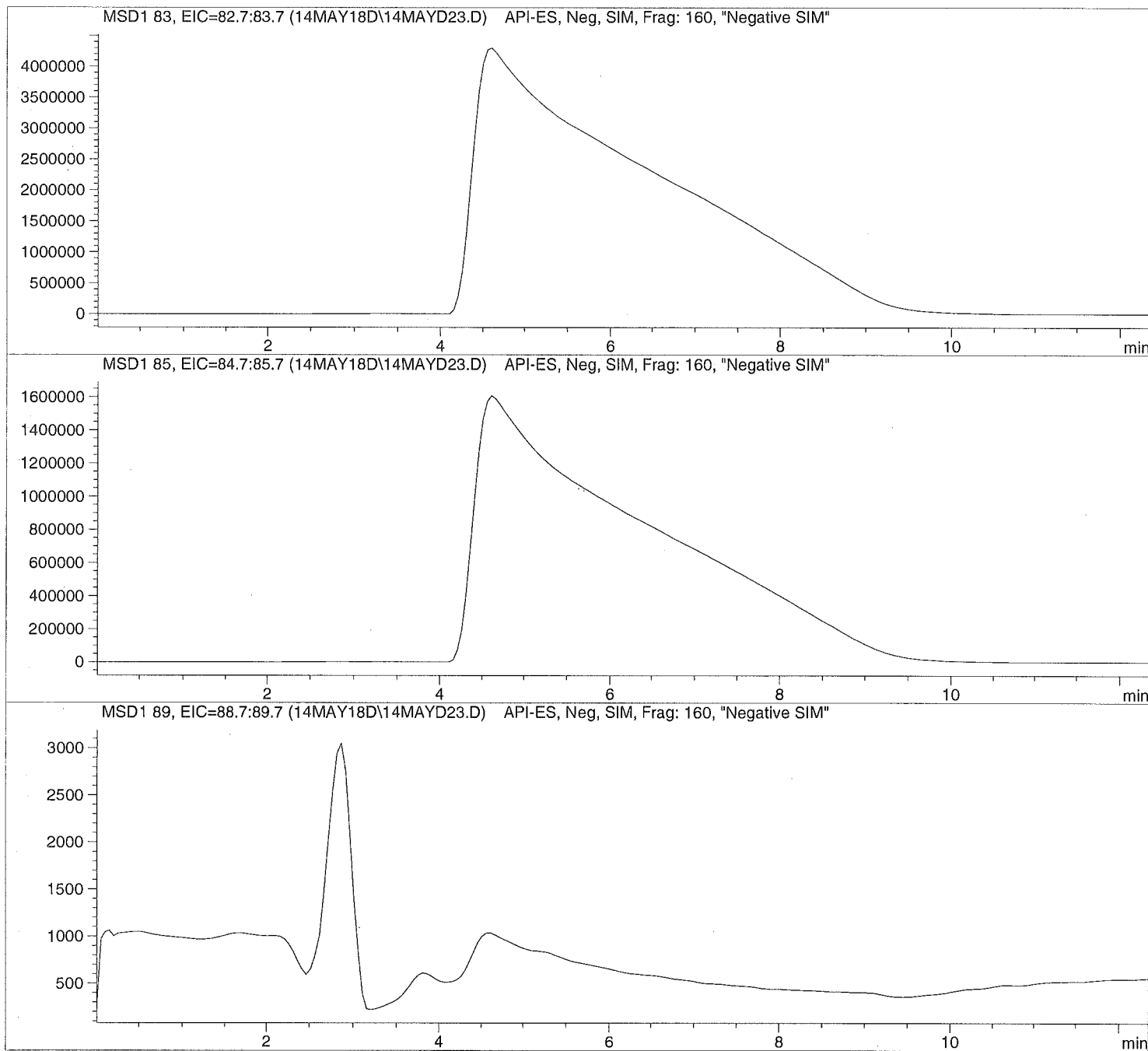
Inj. Vol.: 25 μ l

Acq. Method: CLO4-DOD.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M

Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD23.D

Sample Name: 1813198004

```
=====
Injection Date:  5/14/2018  14:36:12      Seq Line:           23
Sample Name:    1813198004      Location:           Vial 92
Acq Operator:   TNB             Inj. No.:           1
                                   Inj. Vol.:           25 µl
=====
```

```
Acq. Method:    CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   4/2/2018   11:32:43
=====
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

```
=====
LCMS Results
=====
```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

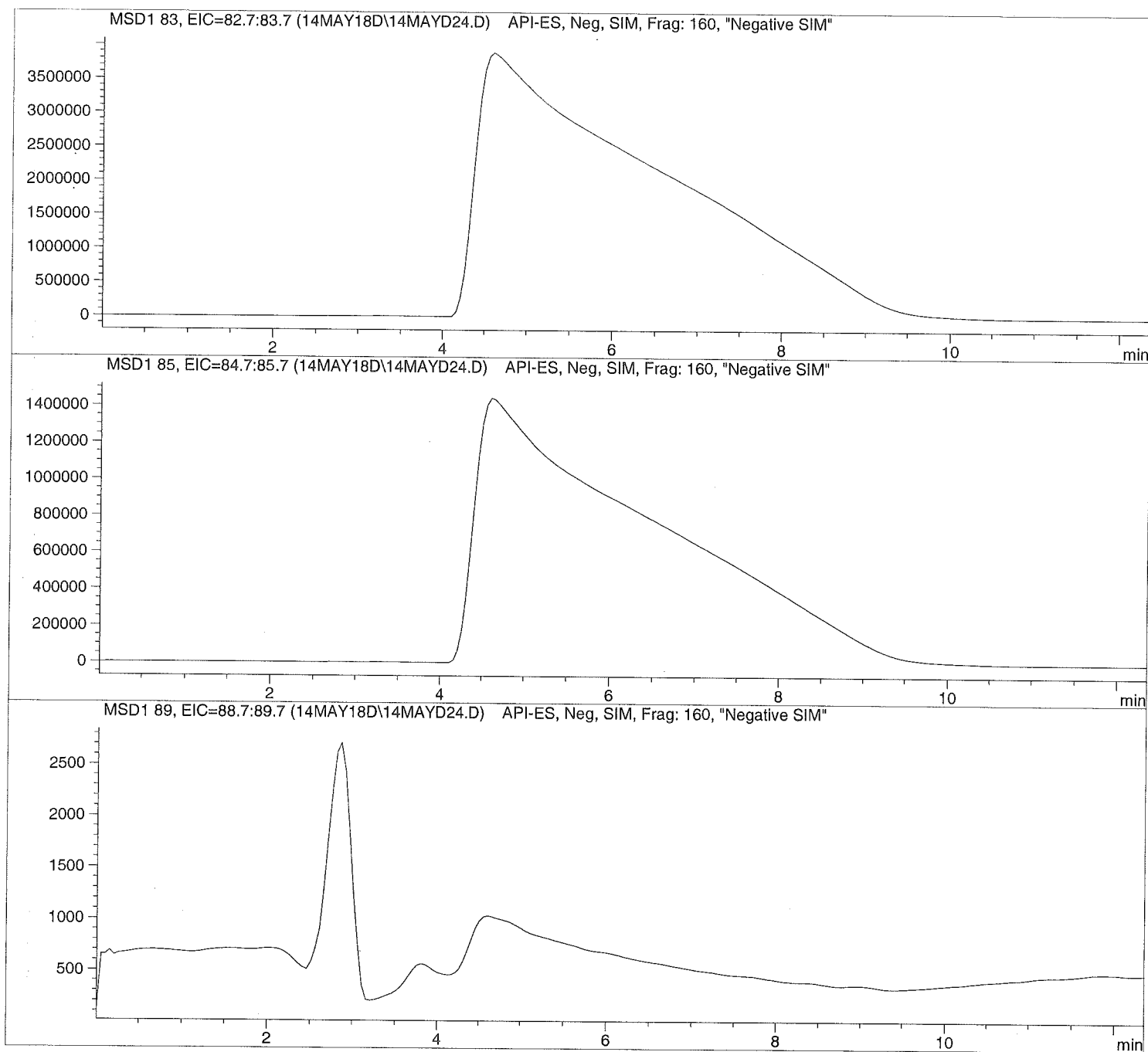
```
=====
*** End of Report ***
=====
```

Injection Date: 5/14/2018 14:50:21
Sample Name: 1813198005
Acq Operator: TNB

Seq Line: 24
Location: Vial 93
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14MAY18D\14MAYD24.D

Sample Name: 1813198005

Injection Date: 5/14/2018 14:50:21 Seq Line: 24
Sample Name: 1813198005 Location: Vial 93
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-DOD.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 4/2/2018 11:32:43

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 2. Apr. 2018, 11:32:41 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

*** End of Report ***

Appendix D

Aquifer Pumping Test Data Plots

LHAAP-17 Ambient Monitoring Plots

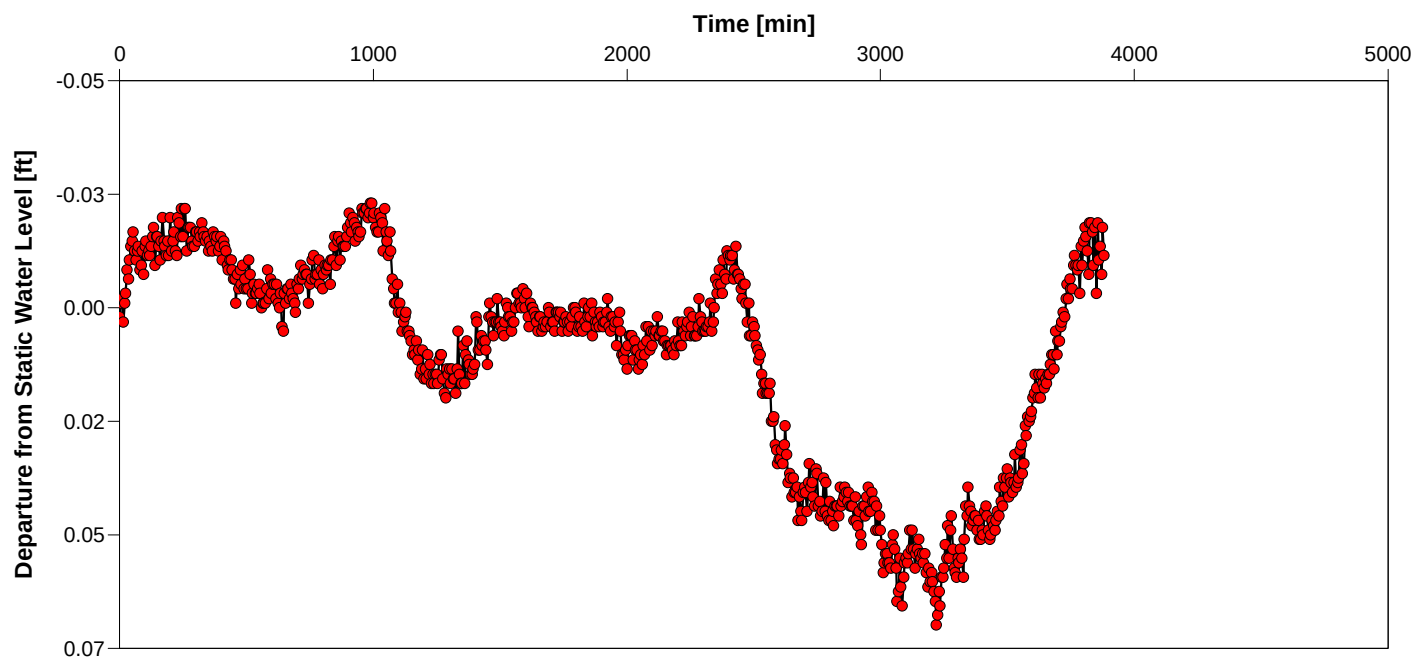
**Pumping Test Analysis Report**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	17PZ01 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	





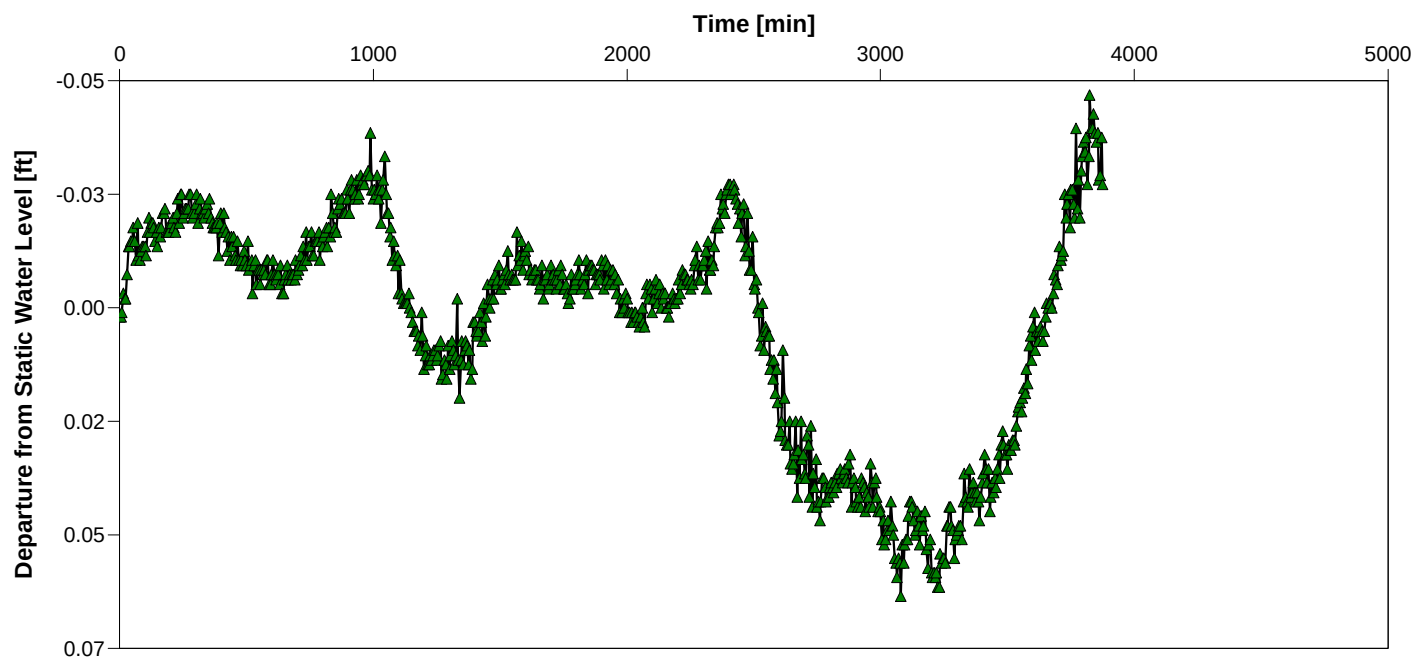
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	17PZ02 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	



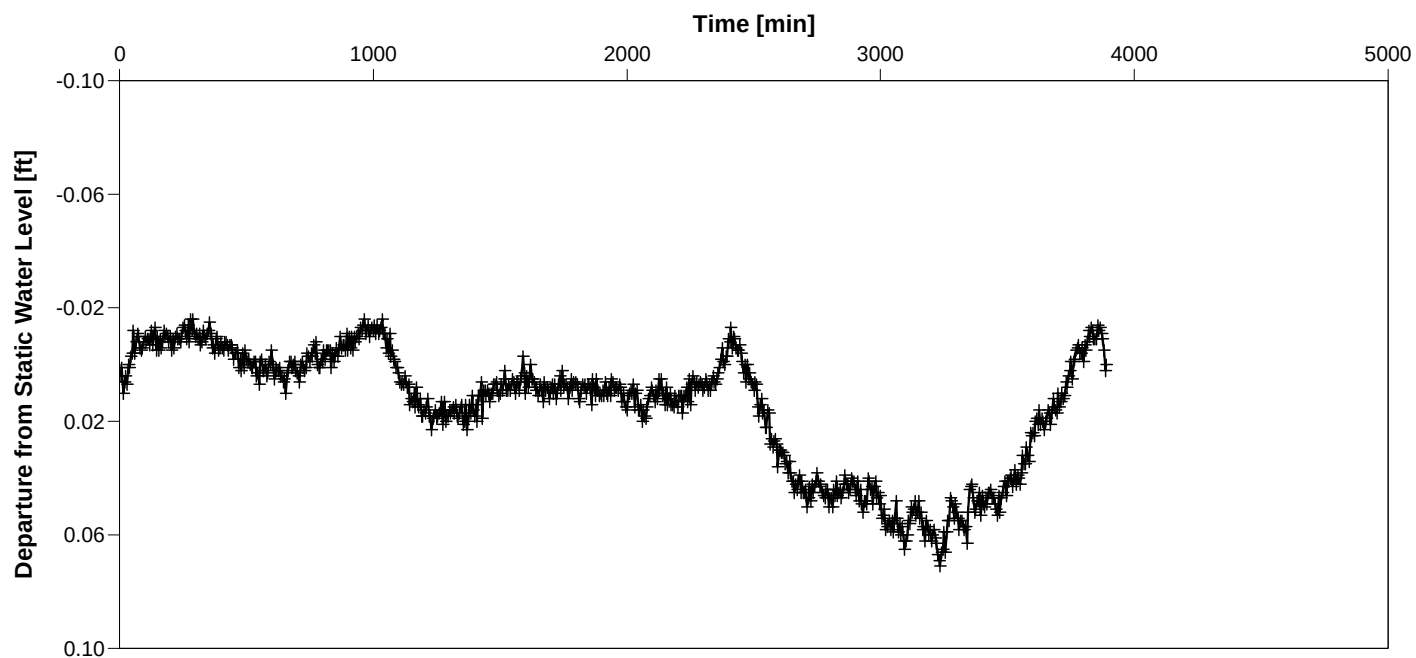
**Pumping Test Analysis Report**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	17PZ03 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	



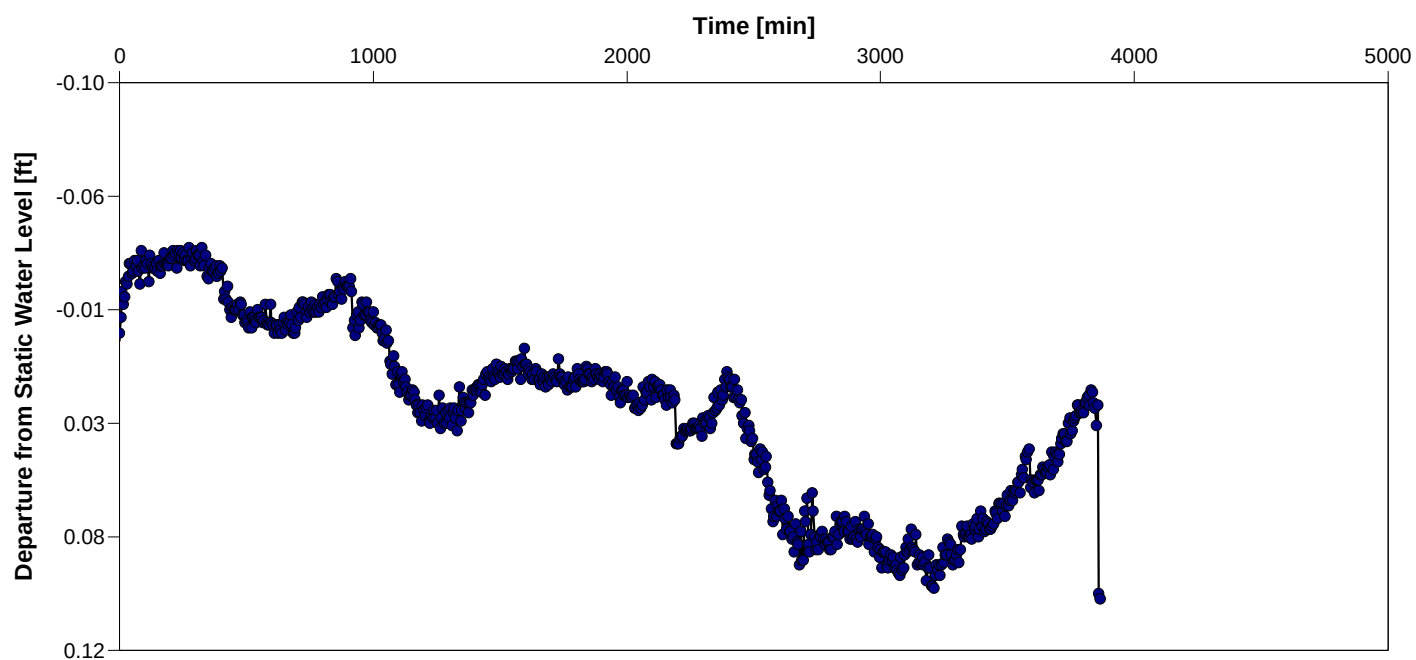
**Pumping Test Analysis Report**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	17WW01 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	





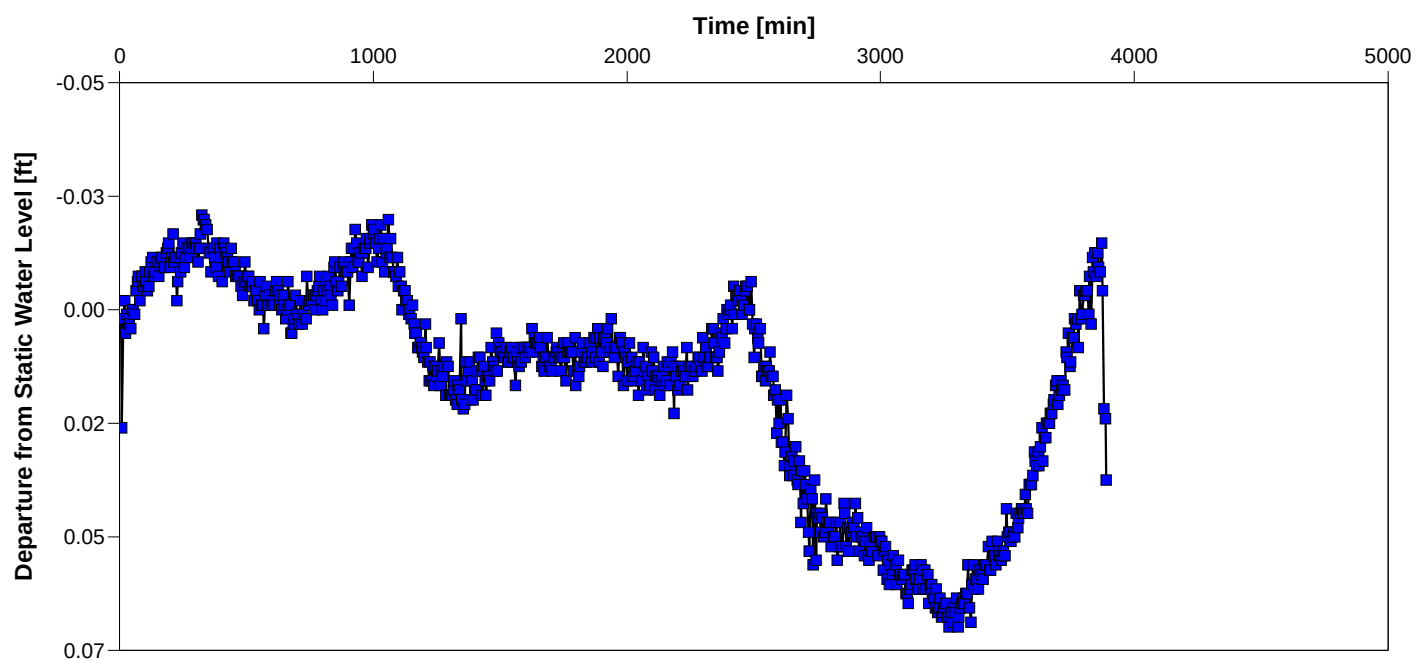
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	17WW02 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	





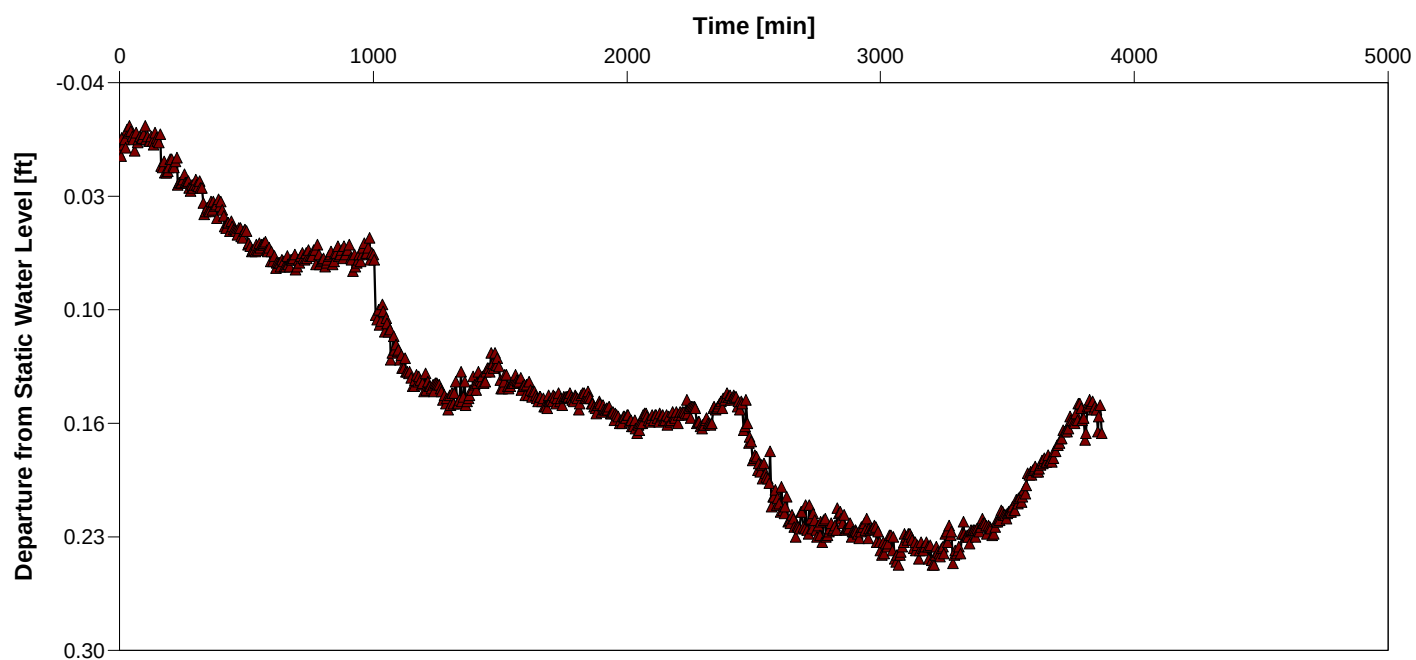
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	17WW06 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	





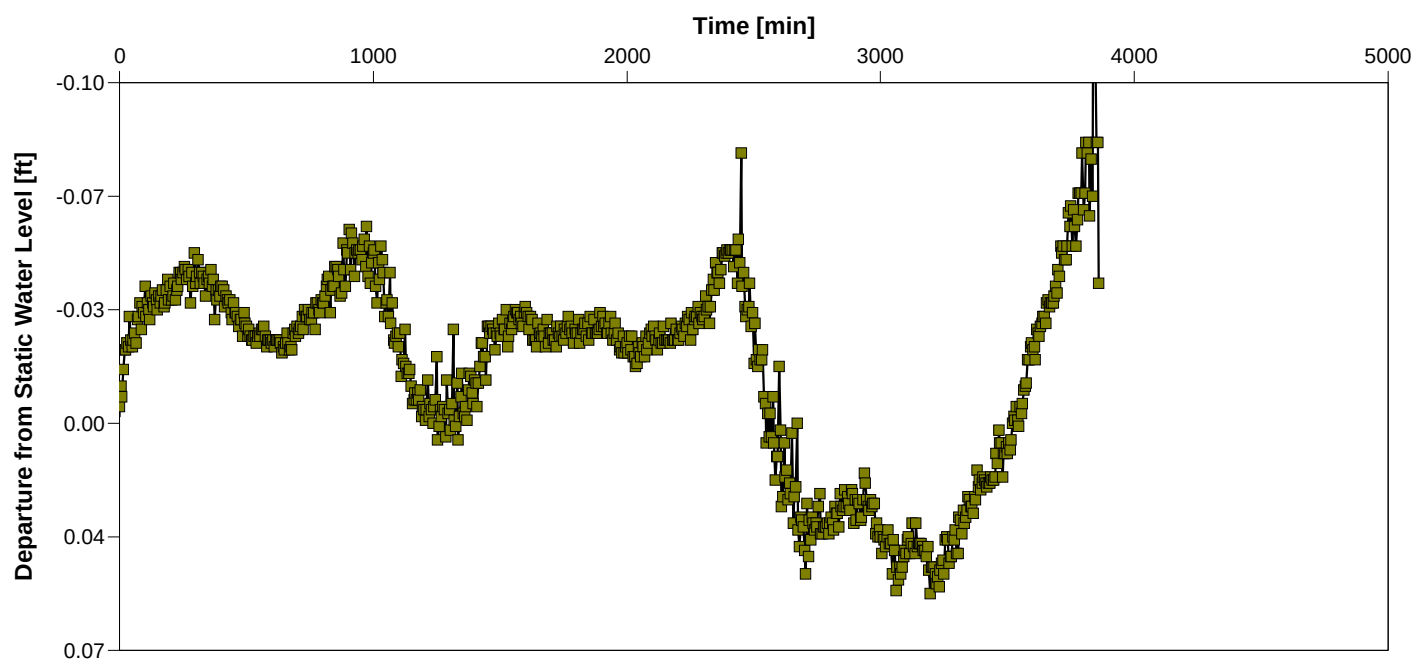
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	130 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	





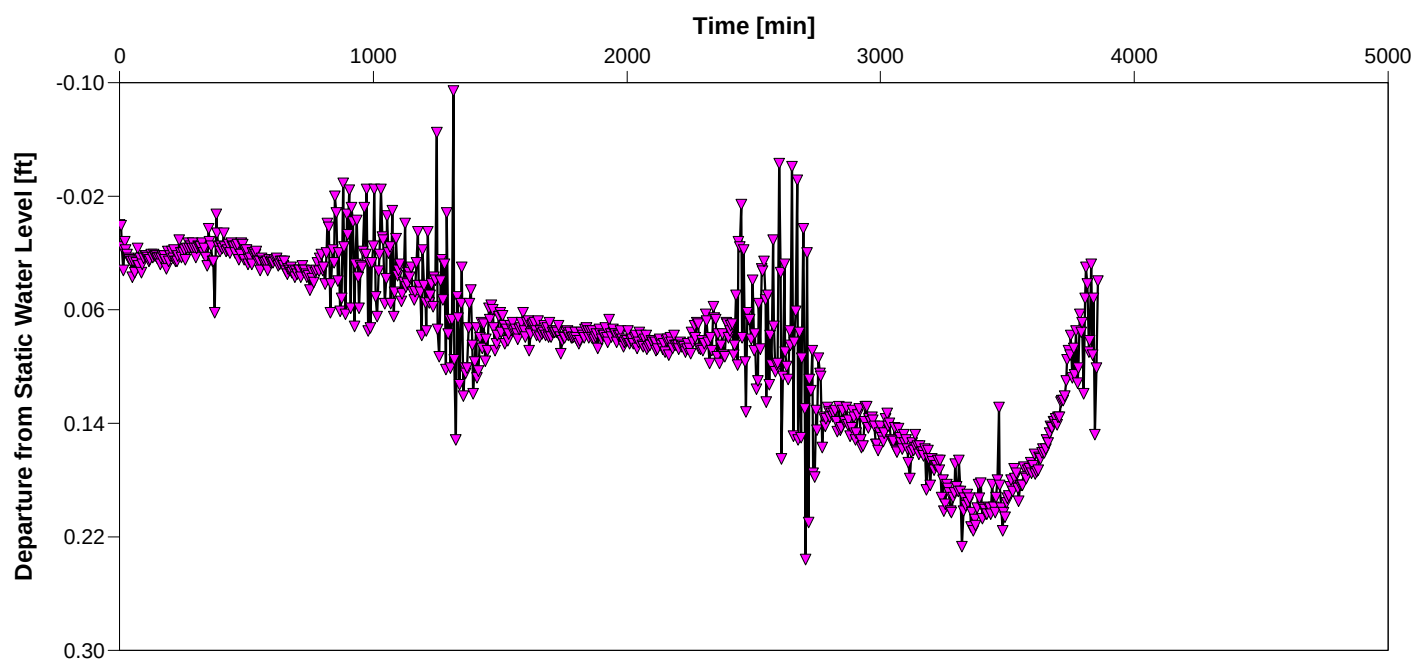
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Ambient Monitoring	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/28/2018
Analysis Performed by: WFoss	MW-8 Ambient Plot	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0 [U.S. gal/min]	



LHAAP-17 Constant Rate Pumping Test Plots



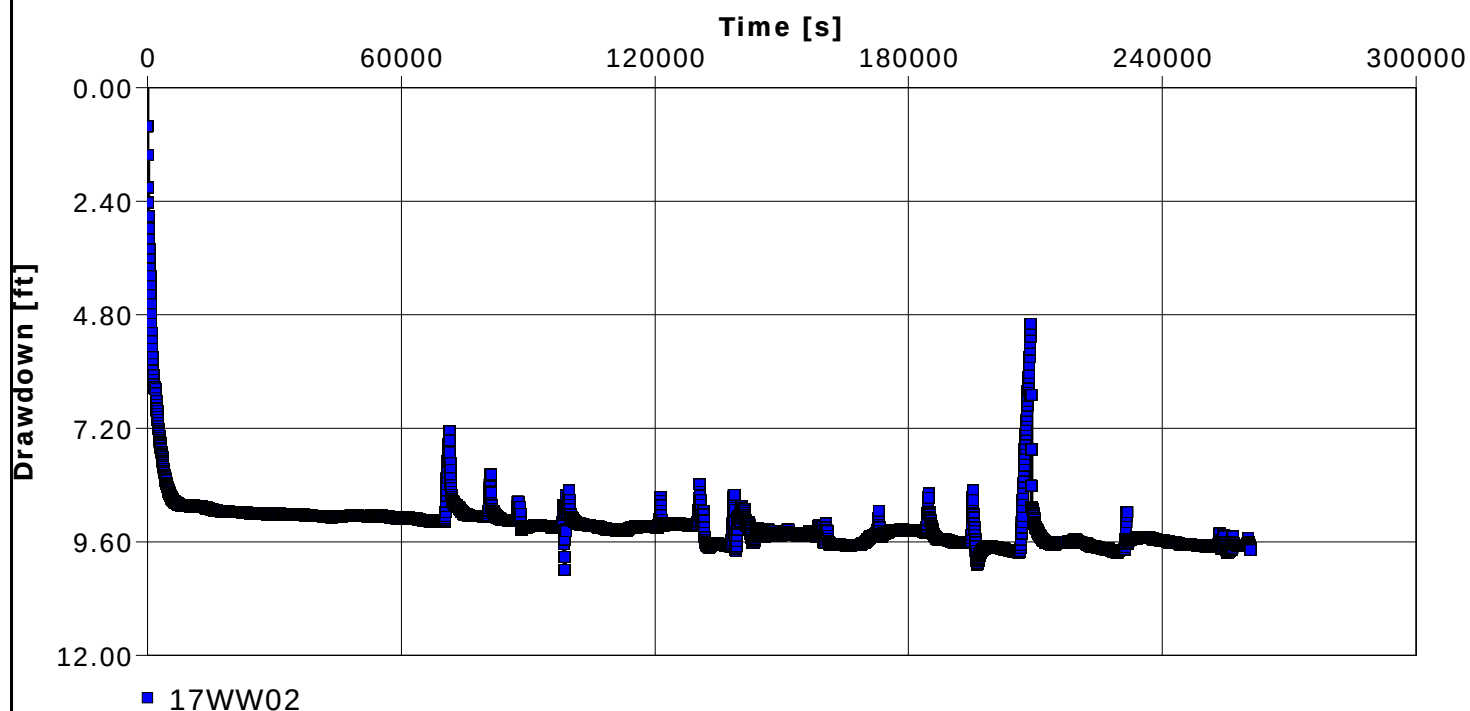
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17WW02 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	





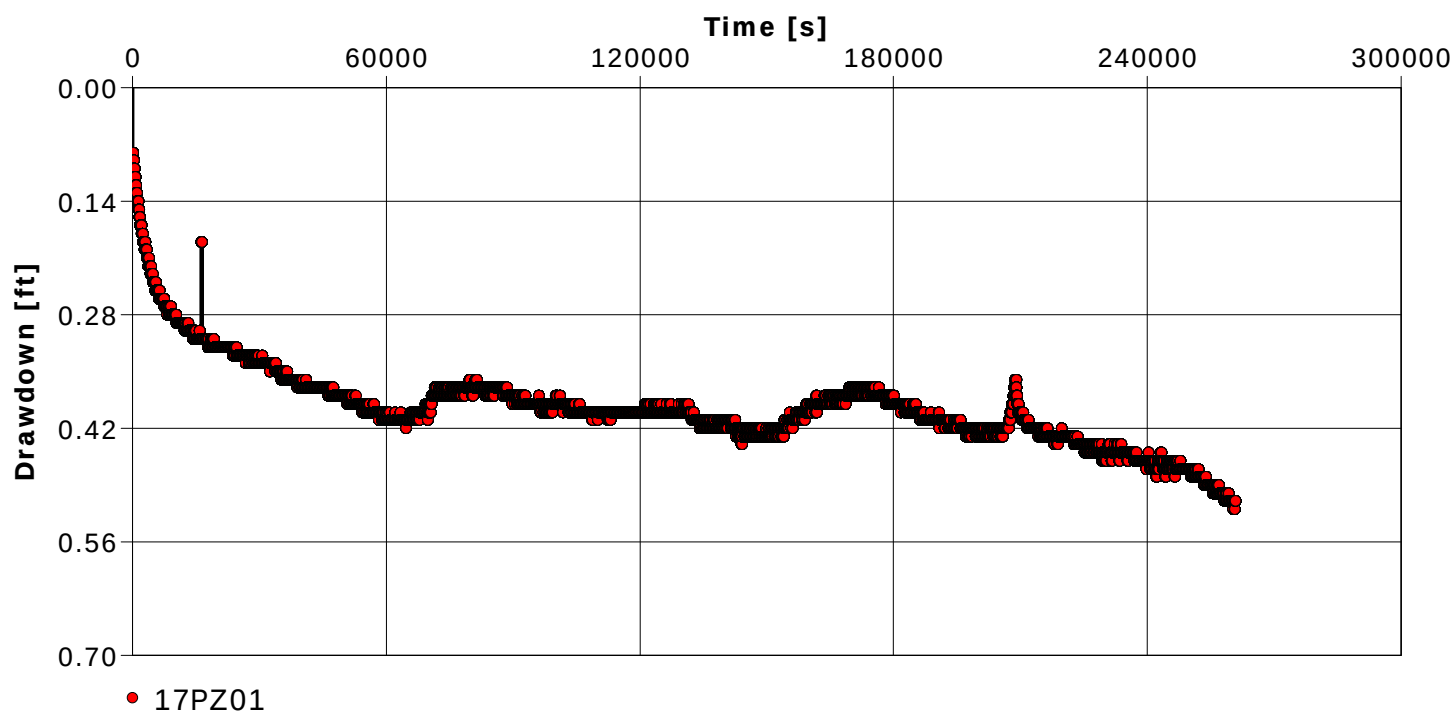
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17PZ01 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	





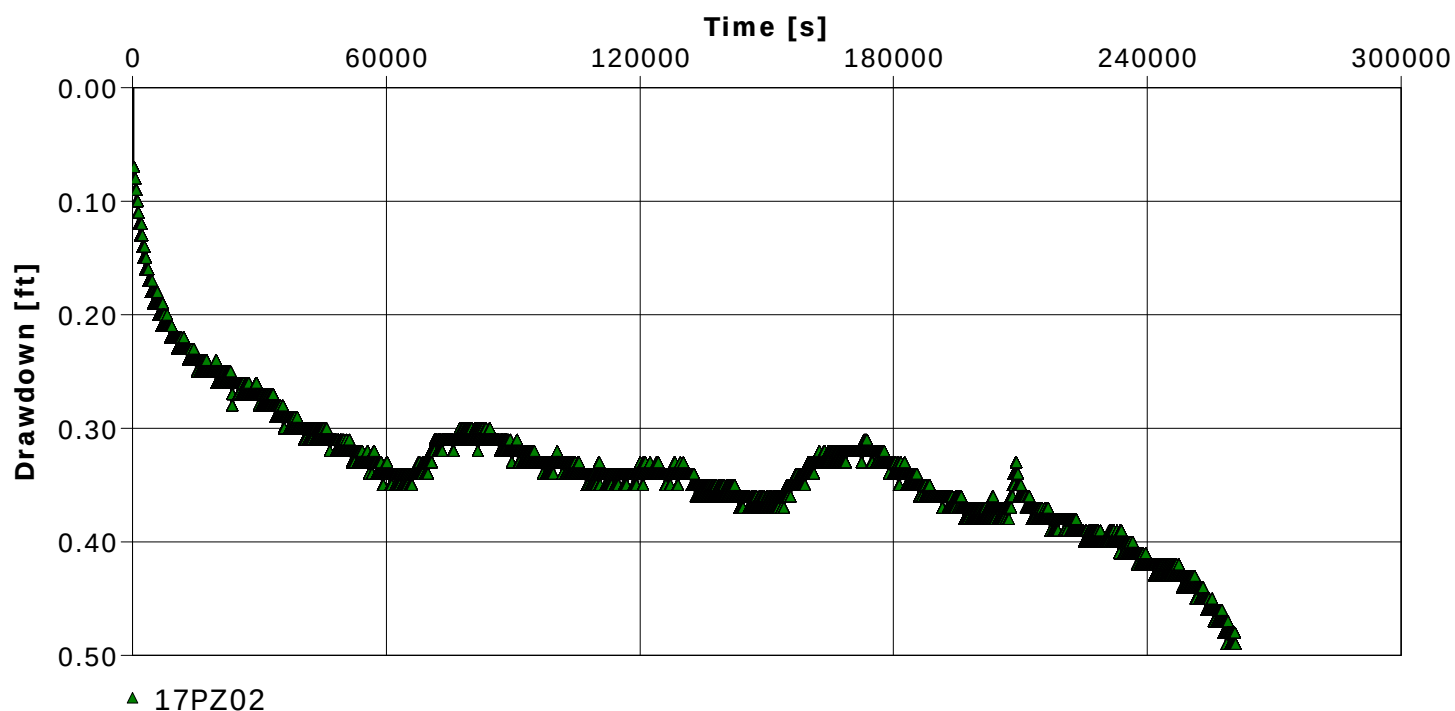
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17PZ02 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	





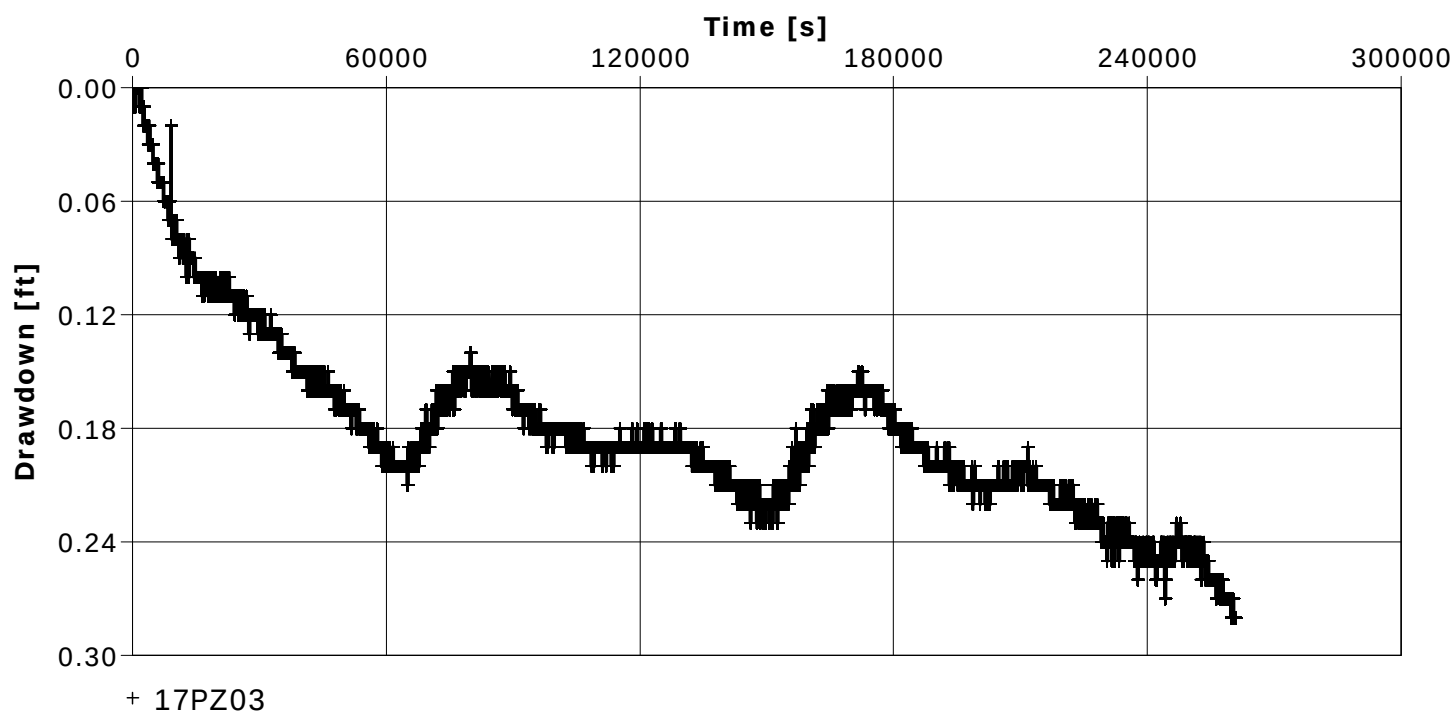
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17PZ03 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	





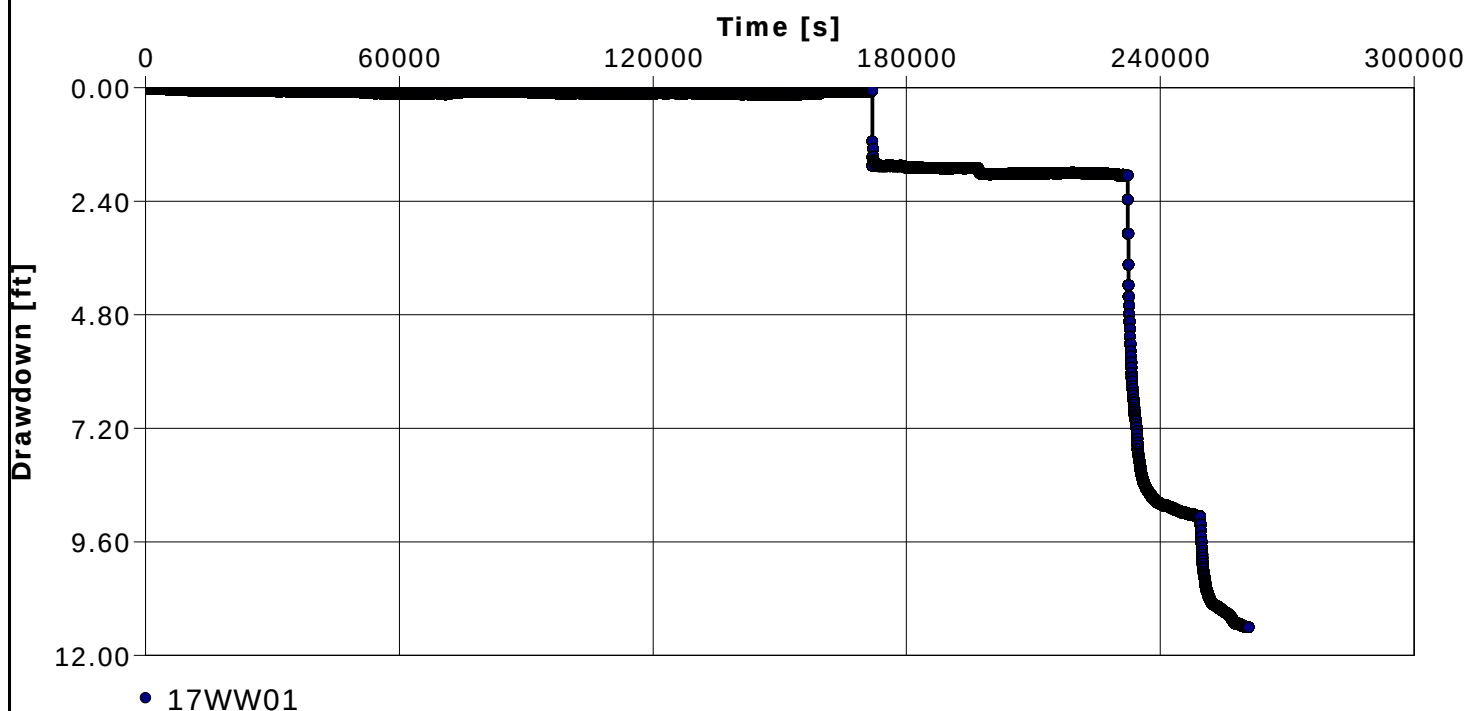
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17WW01 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	



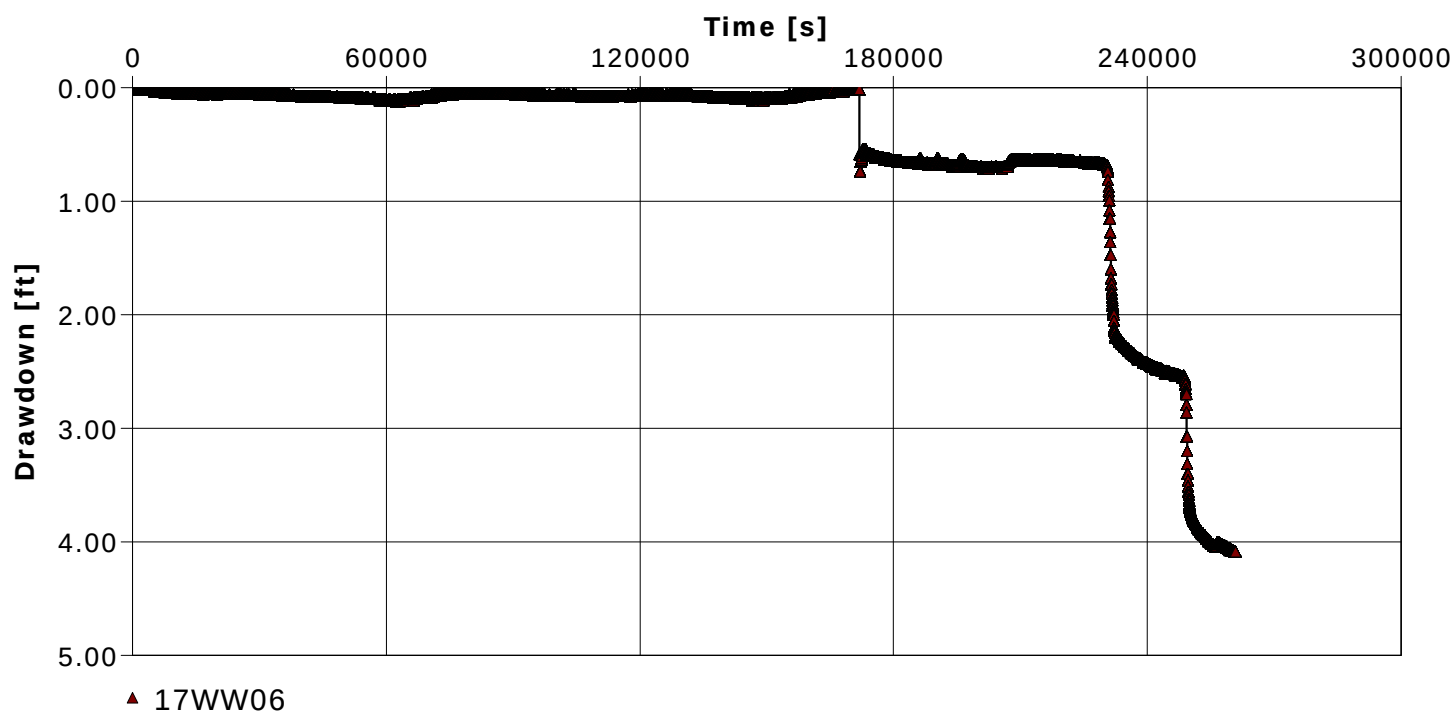
**Pumping Test Analysis Report**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	17WW06 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	





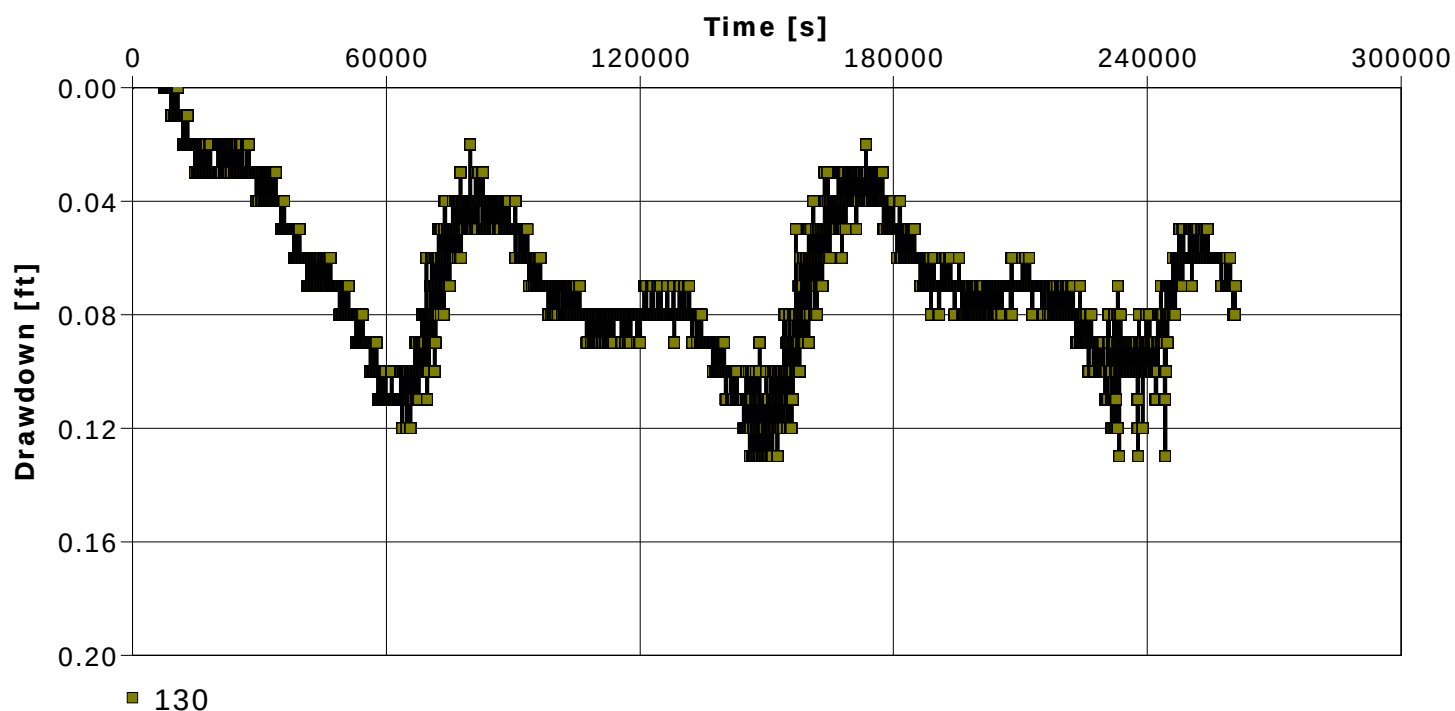
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	130 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	



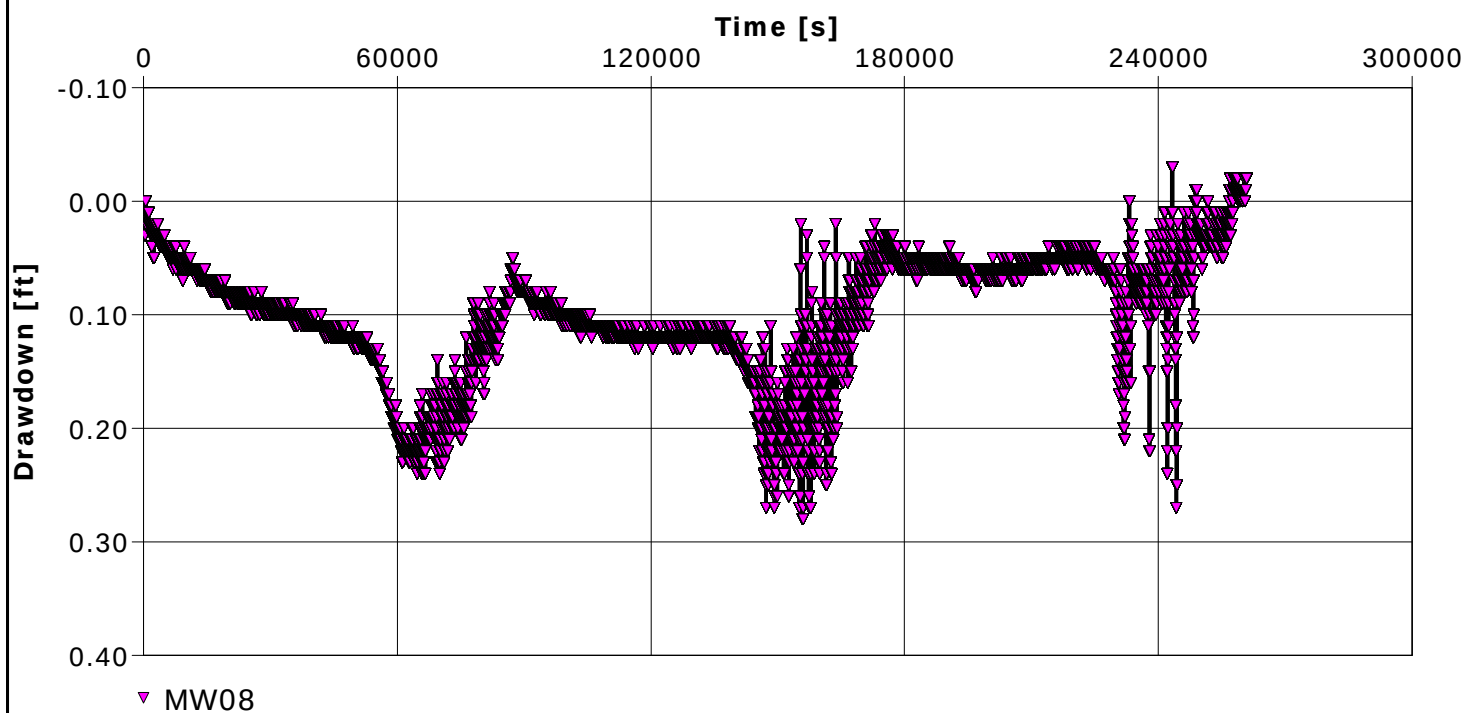
**Pumping Test Analysis Report**

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Constant Rate Pumping Test	Pumping Well: 17WW02
Test Conducted by: Bill Foss		Test Date: 1/23/2018
Analysis Performed by: WFoss	MW08 Time-Drawdown	Analysis Date: 3/27/2018
Aquifer Thickness: 15.73 ft	Discharge Rate: 0.24 [U.S. gal/min]	



LHAAP-17 Recovery Test Plots



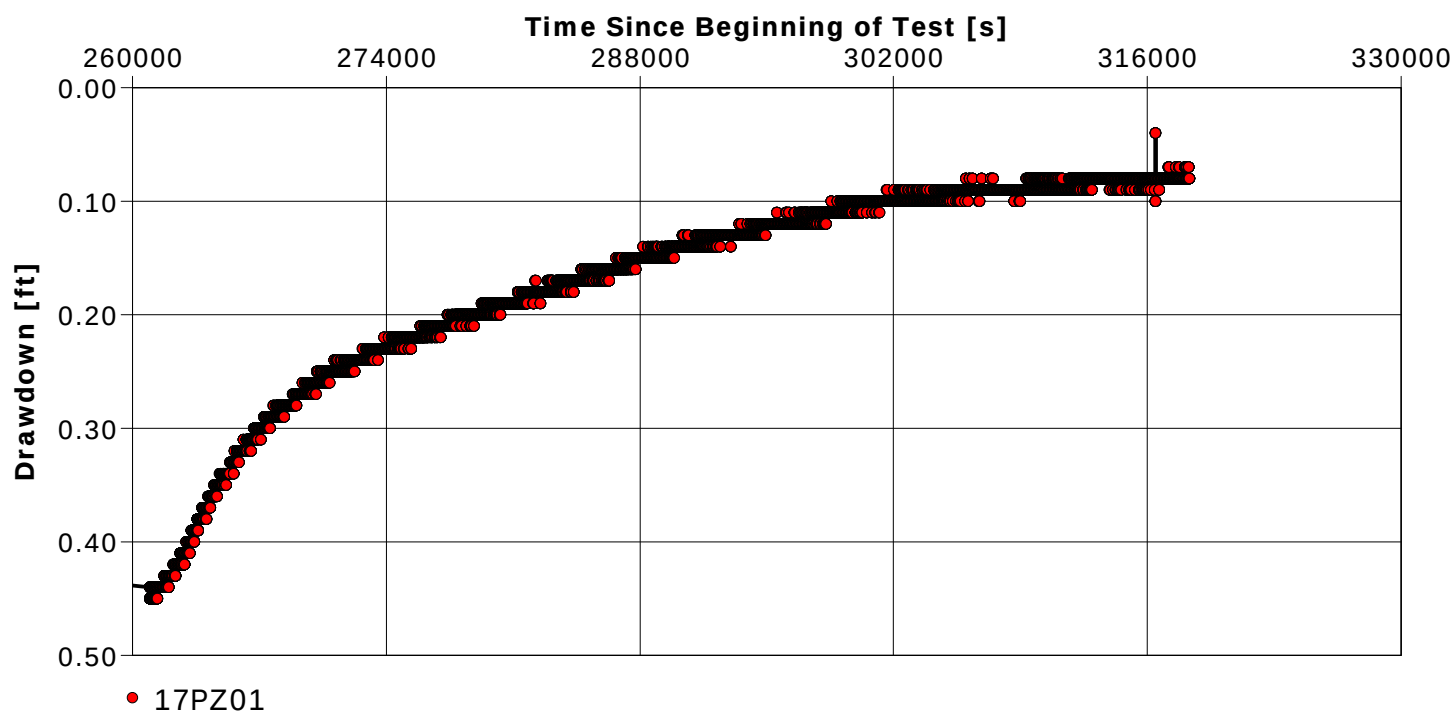
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17PZ01 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	





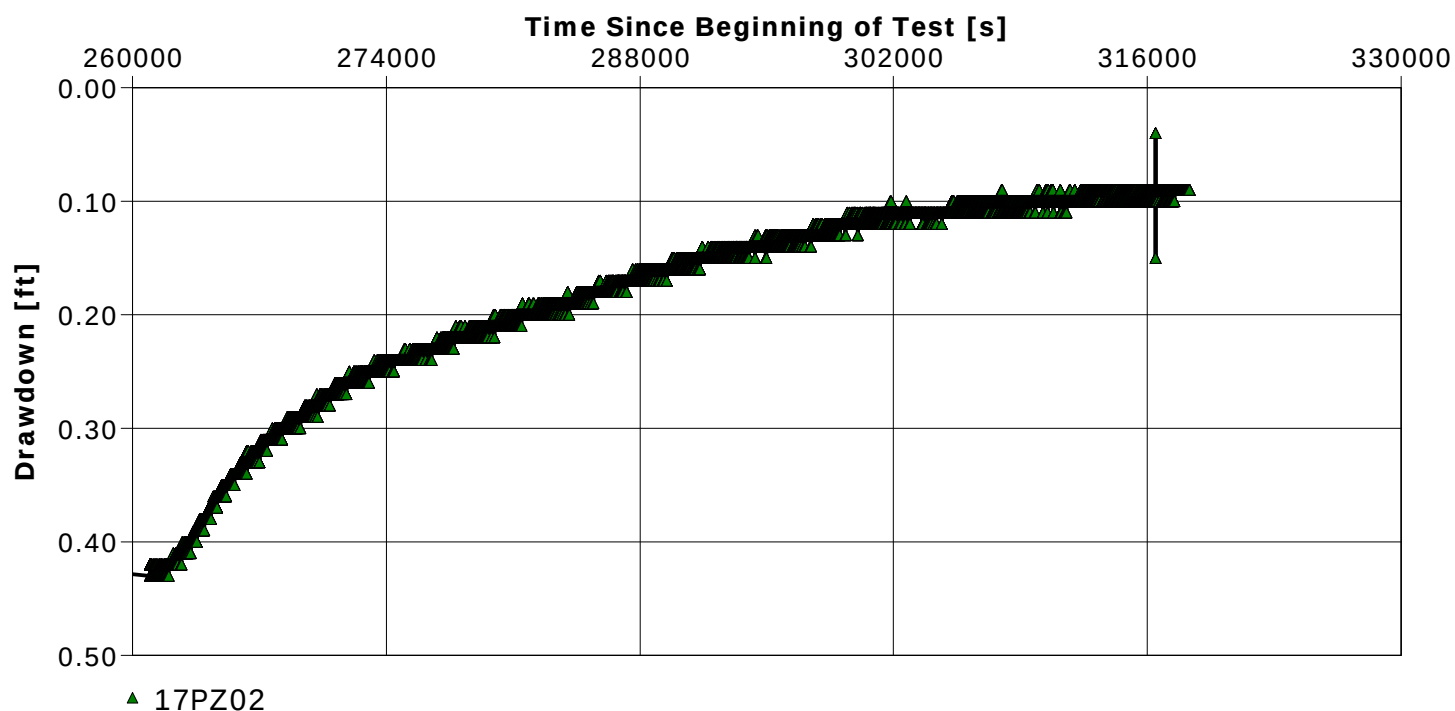
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17PZ02 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	





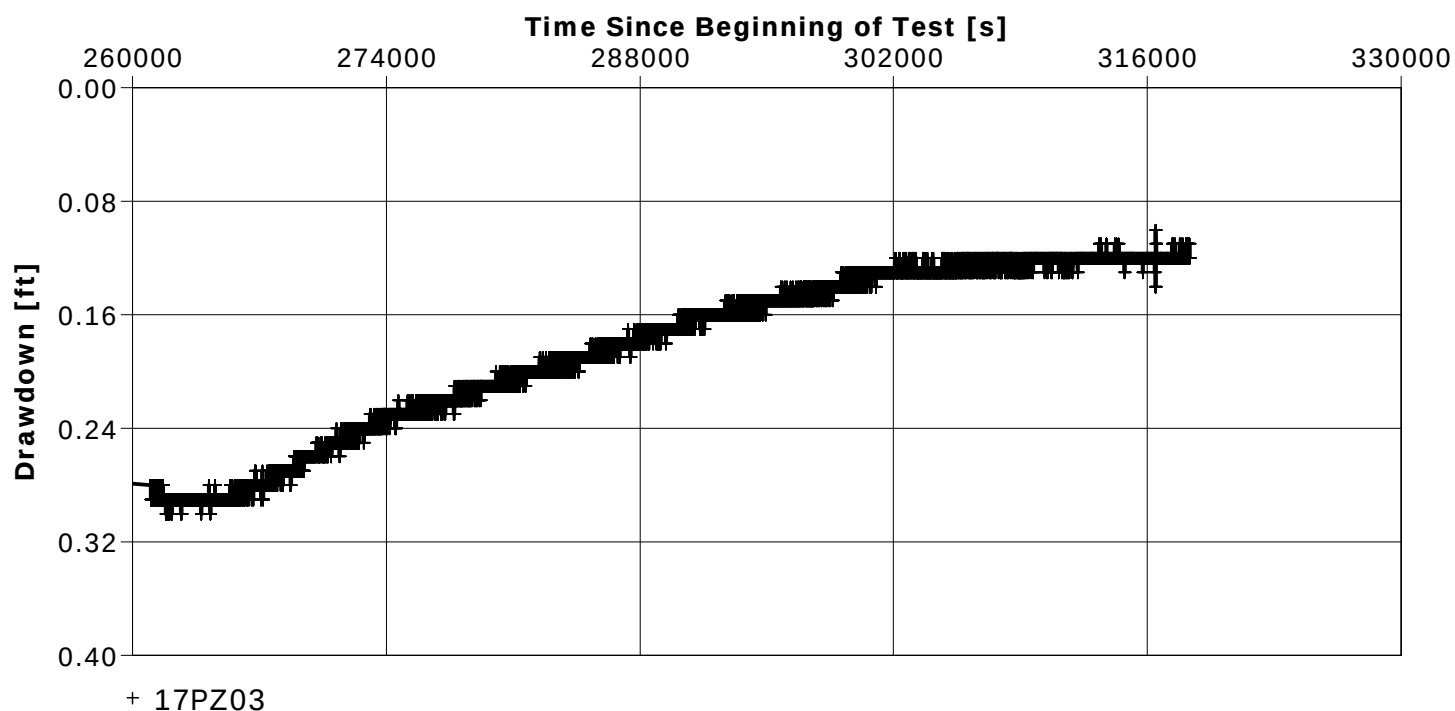
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17PZ03 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	





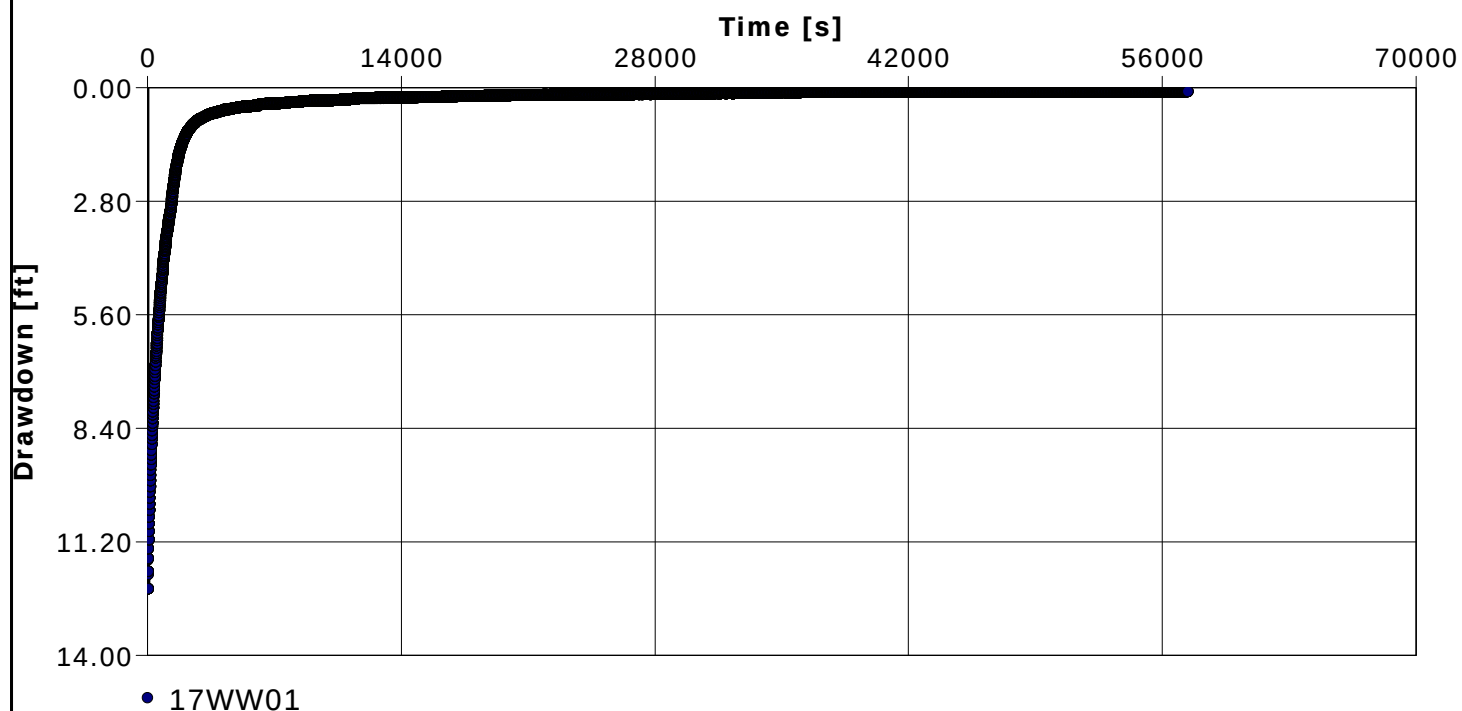
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17WW01 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	





Pumping Test Analysis Report

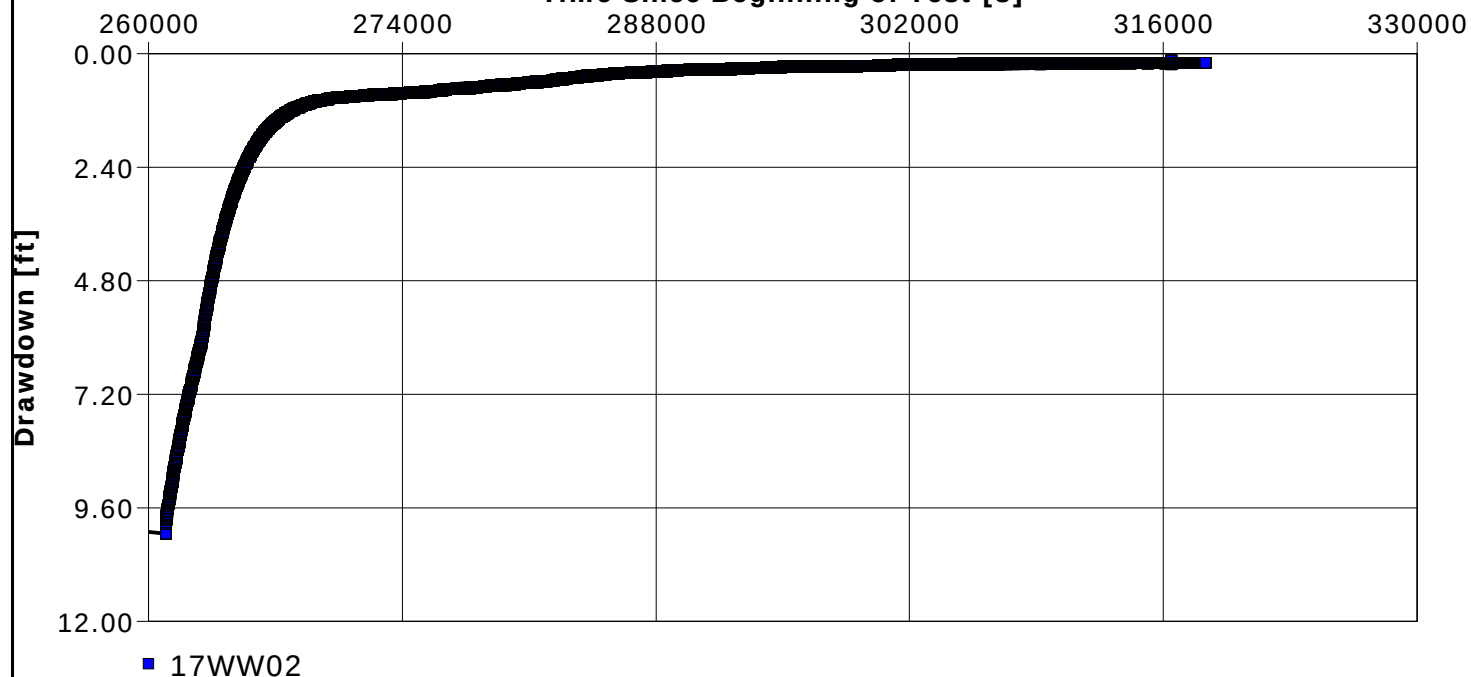
Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17WW02 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	

Time Since Beginning of Test [s]





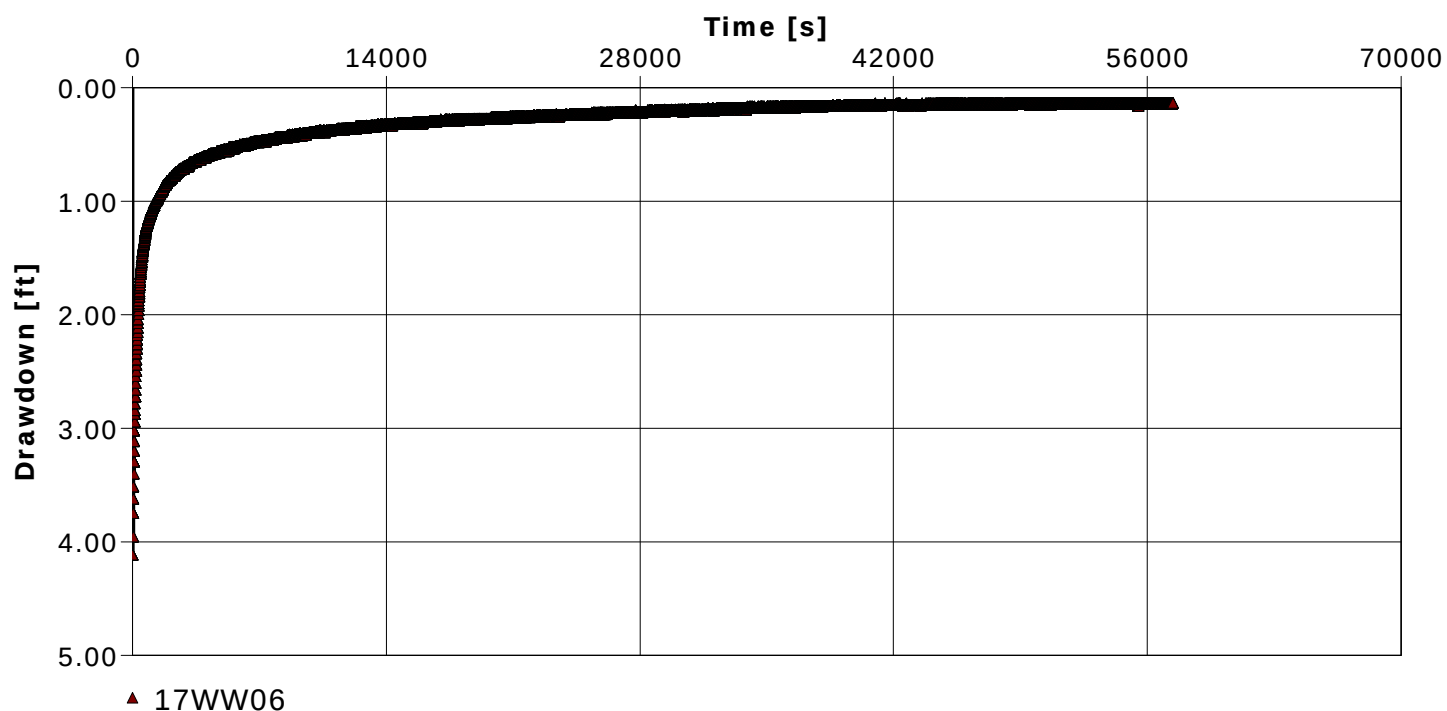
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	17WW06 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	





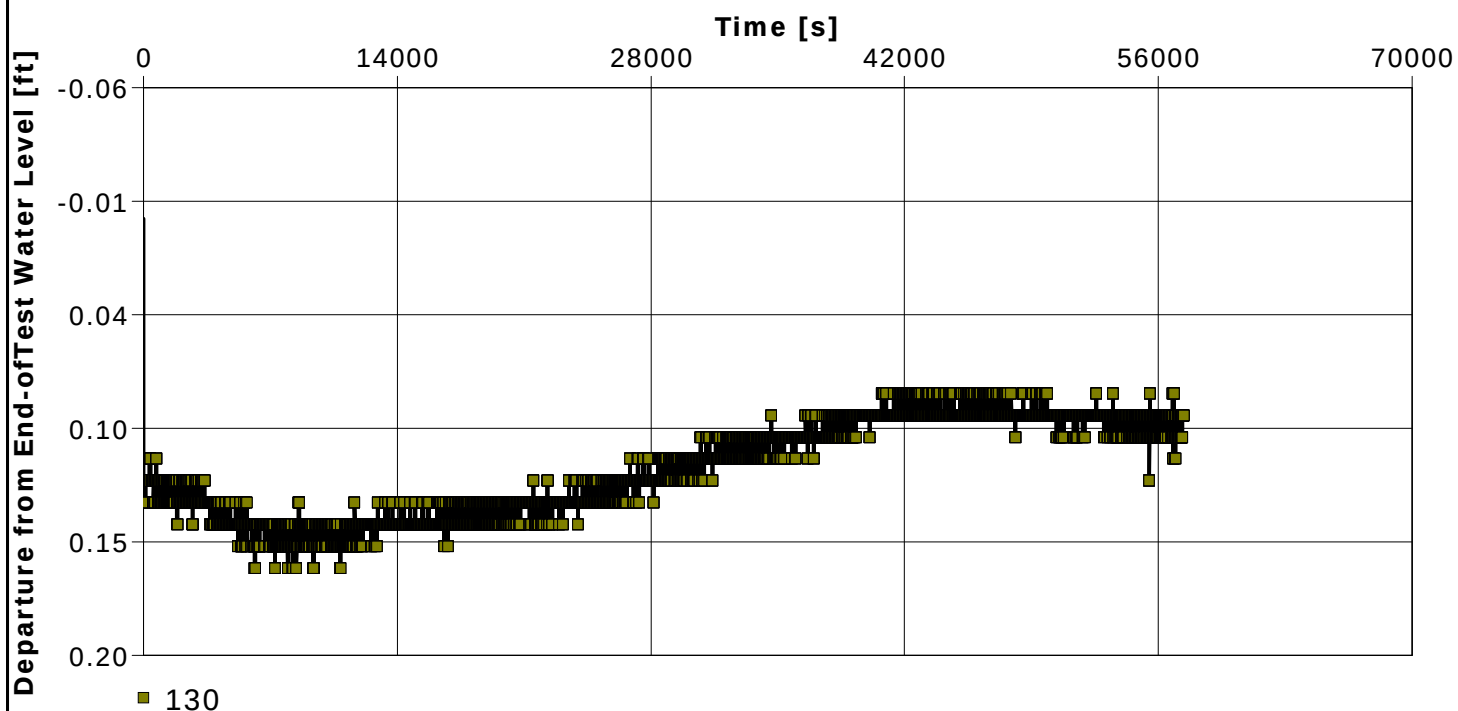
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	130 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	





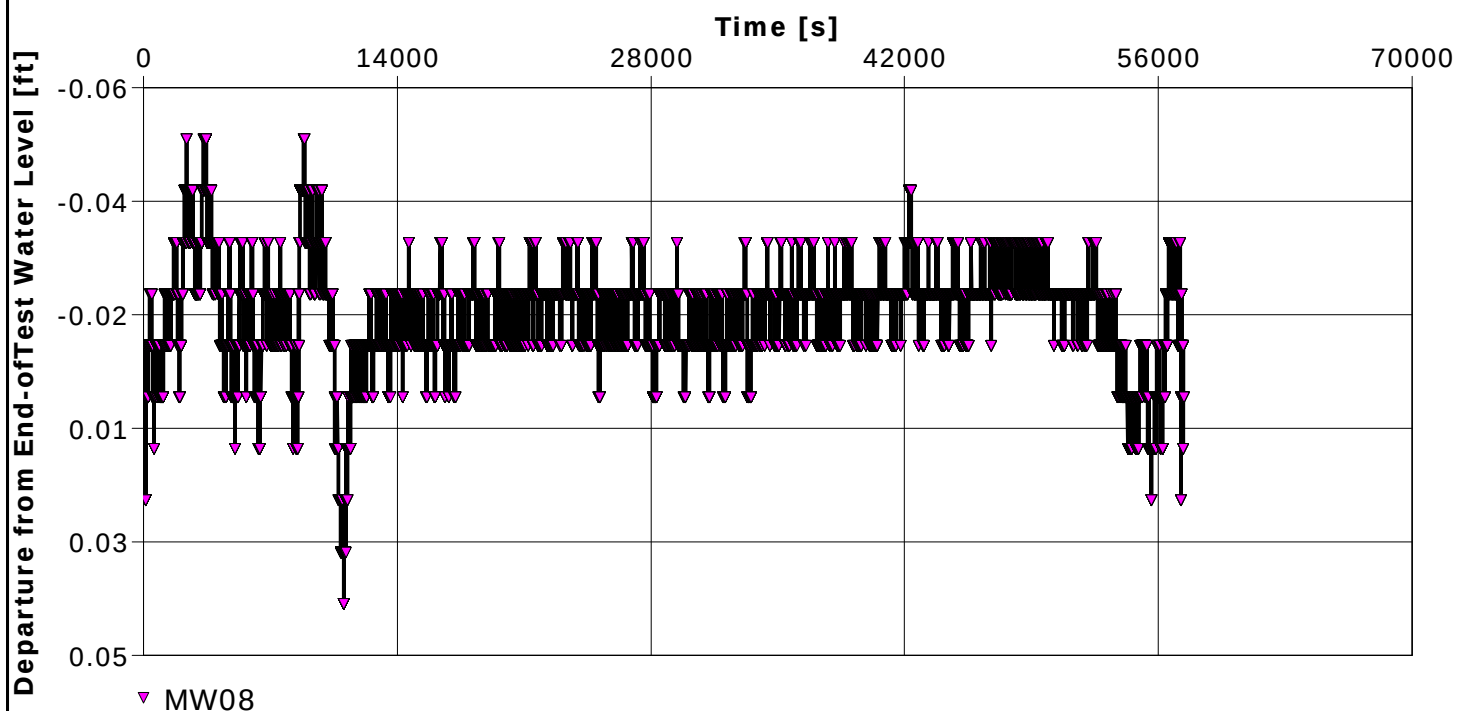
Pumping Test Analysis Report

Project: Longhorn Army Ammunition Plant

Number: 501032

Client: USACE

Location: LHAAP-17	Pumping Test: Recovery Test	Pumping Well: 17WW02
Test Conducted by: WFoss		Test Date: 3/27/2018
Analysis Performed by: WFoss	MW-8 Recovery	Analysis Date: 3/28/2018
Aquifer Thickness: 15.73 ft	Discharge: variable, average rate 0.24 [U.S. gal/min]	



Appendix E

Aquifer Pumping Test Data Files

(Provided on compact disc)

AMBIENT DATA

17PZ01 Ambient.txt

Date	Time	Elapsed Time	Depth (ft)
1/19/2018	6:03:29 PM	0	9.253
1/19/2018	6:08:29 PM	300.001	9.25
1/19/2018	6:13:29 PM	600.001	9.249
1/19/2018	6:18:29 PM	900.001	9.254
1/19/2018	6:23:29 PM	1200.001	9.25
1/19/2018	6:28:29 PM	1500.001	9.248
1/19/2018	6:33:29 PM	1800.001	9.243
1/19/2018	6:38:29 PM	2100.001	9.245
1/19/2018	6:43:29 PM	2400.001	9.241
1/19/2018	6:48:29 PM	2700.001	9.238
1/19/2018	6:53:29 PM	3000.001	9.237
1/19/2018	6:58:29 PM	3300.001	9.235
1/19/2018	7:03:29 PM	3600.001	9.239
1/19/2018	7:08:29 PM	3900.001	9.241
1/19/2018	7:13:29 PM	4200.001	9.239
1/19/2018	7:18:29 PM	4500.001	9.238
1/19/2018	7:23:29 PM	4800.001	9.243
1/19/2018	7:28:29 PM	5100.001	9.242
1/19/2018	7:33:29 PM	5400.001	9.239
1/19/2018	7:38:29 PM	5700.001	9.244
1/19/2018	7:43:29 PM	6000.001	9.238
1/19/2018	7:48:29 PM	6300.001	9.237
1/19/2018	7:53:29 PM	6600.001	9.24
1/19/2018	7:58:29 PM	6900.001	9.239
1/19/2018	8:03:29 PM	7200.001	9.24
1/19/2018	8:08:29 PM	7500.001	9.238
1/19/2018	8:13:29 PM	7800.001	9.236
1/19/2018	8:18:29 PM	8100.001	9.234
1/19/2018	8:23:29 PM	8400.001	9.242
1/19/2018	8:28:29 PM	8700.001	9.236
1/19/2018	8:33:29 PM	9000.001	9.236
1/19/2018	8:38:29 PM	9300.001	9.238
1/19/2018	8:43:29 PM	9600.001	9.241
1/19/2018	8:48:29 PM	9900.001	9.237
1/19/2018	8:53:29 PM	10200.001	9.232
1/19/2018	8:58:29 PM	10500.001	9.237
1/19/2018	9:03:29 PM	10800.001	9.238
1/19/2018	9:08:29 PM	11100.001	9.24
1/19/2018	9:13:29 PM	11400.001	9.237
1/19/2018	9:18:29 PM	11700.001	9.24
1/19/2018	9:23:29 PM	12000.001	9.232
1/19/2018	9:28:29 PM	12300.001	9.239
1/19/2018	9:33:29 PM	12600.001	9.237
1/19/2018	9:38:29 PM	12900.001	9.235
1/19/2018	9:43:29 PM	13200.001	9.239
1/19/2018	9:48:29 PM	13500.001	9.24
1/19/2018	9:53:29 PM	13800.001	9.232

17PZ01 Ambient.txt

1/19/2018	9:58:29 PM	14100.001	9.233
1/19/2018	10:03:29 PM	14400.001	9.236
1/19/2018	10:08:29 PM	14700.001	9.23
1/19/2018	10:13:29 PM	15000.001	9.236
1/19/2018	10:18:29 PM	15300.001	9.23
1/19/2018	10:23:29 PM	15600.001	9.23
1/19/2018	10:28:29 PM	15900.001	9.239
1/19/2018	10:33:29 PM	16200.001	9.234
1/19/2018	10:38:29 PM	16500.001	9.234
1/19/2018	10:43:29 PM	16800.001	9.234
1/19/2018	10:48:29 PM	17100.001	9.237
1/19/2018	10:53:29 PM	17400.001	9.238
1/19/2018	10:58:29 PM	17700.001	9.238
1/19/2018	11:03:29 PM	18000.001	9.235
1/19/2018	11:08:29 PM	18300.001	9.235
1/19/2018	11:13:29 PM	18600.001	9.237
1/19/2018	11:18:29 PM	18900.001	9.235
1/19/2018	11:23:29 PM	19200.001	9.236
1/19/2018	11:28:29 PM	19500.001	9.233
1/19/2018	11:33:29 PM	19800.001	9.235
1/19/2018	11:38:29 PM	20100.001	9.236
1/19/2018	11:43:29 PM	20400.001	9.237
1/19/2018	11:48:29 PM	20700.001	9.236
1/19/2018	11:53:29 PM	21000.001	9.239
1/19/2018	11:58:29 PM	21300.001	9.237
1/20/2018	12:03:29 AM	21600.001	9.238
1/20/2018	12:08:29 AM	21900.001	9.239
1/20/2018	12:13:29 AM	22200.001	9.235
1/20/2018	12:18:29 AM	22500.001	9.236
1/20/2018	12:23:29 AM	22800.001	9.237
1/20/2018	12:28:29 AM	23100.001	9.236
1/20/2018	12:33:29 AM	23400.001	9.239
1/20/2018	12:38:29 AM	23700.001	9.238
1/20/2018	12:43:29 AM	24000.001	9.236
1/20/2018	12:48:29 AM	24300.001	9.241
1/20/2018	12:53:29 AM	24600.001	9.237
1/20/2018	12:58:29 AM	24900.001	9.238
1/20/2018	1:03:29 AM	25200.001	9.239
1/20/2018	1:08:29 AM	25500.001	9.242
1/20/2018	1:13:29 AM	25800.001	9.243
1/20/2018	1:18:29 AM	26100.001	9.241
1/20/2018	1:23:29 AM	26400.001	9.241
1/20/2018	1:28:29 AM	26700.001	9.243
1/20/2018	1:33:29 AM	27000.001	9.245
1/20/2018	1:38:29 AM	27300.001	9.245
1/20/2018	1:43:29 AM	27600.001	9.25
1/20/2018	1:48:29 AM	27900.001	9.244
1/20/2018	1:53:29 AM	28200.001	9.247

17PZ01 Ambient.txt

1/20/2018	1:58:29 AM	28500.001	9.243
1/20/2018	2:03:29 AM	28800.001	9.246
1/20/2018	2:08:29 AM	29100.001	9.242
1/20/2018	2:13:29 AM	29400.001	9.247
1/20/2018	2:18:29 AM	29700.001	9.245
1/20/2018	2:23:29 AM	30000.001	9.247
1/20/2018	2:28:29 AM	30300.001	9.247
1/20/2018	2:33:29 AM	30600.001	9.241
1/20/2018	2:38:29 AM	30900.001	9.244
1/20/2018	2:43:29 AM	31200.001	9.25
1/20/2018	2:48:29 AM	31500.001	9.248
1/20/2018	2:53:29 AM	31800.001	9.246
1/20/2018	2:58:29 AM	32100.001	9.248
1/20/2018	3:03:29 AM	32400.001	9.248
1/20/2018	3:08:29 AM	32700.001	9.247
1/20/2018	3:13:29 AM	33000.001	9.246
1/20/2018	3:18:29 AM	33300.001	9.248
1/20/2018	3:23:29 AM	33600.001	9.251
1/20/2018	3:28:29 AM	33900.001	9.25
1/20/2018	3:33:29 AM	34200.001	9.25
1/20/2018	3:38:29 AM	34500.001	9.25
1/20/2018	3:43:29 AM	34800.001	9.247
1/20/2018	3:48:29 AM	35100.001	9.243
1/20/2018	3:53:29 AM	35400.001	9.249
1/20/2018	3:58:29 AM	35700.001	9.245
1/20/2018	4:03:29 AM	36000.001	9.248
1/20/2018	4:08:29 AM	36300.001	9.246
1/20/2018	4:13:29 AM	36600.001	9.246
1/20/2018	4:18:29 AM	36900.001	9.249
1/20/2018	4:23:29 AM	37200.001	9.246
1/20/2018	4:28:29 AM	37500.001	9.25
1/20/2018	4:33:29 AM	37800.001	9.251
1/20/2018	4:38:29 AM	38100.001	9.248
1/20/2018	4:43:29 AM	38400.001	9.255
1/20/2018	4:48:29 AM	38700.001	9.256
1/20/2018	4:53:29 AM	39000.001	9.248
1/20/2018	4:58:29 AM	39300.001	9.25
1/20/2018	5:03:29 AM	39600.001	9.247
1/20/2018	5:08:29 AM	39900.001	9.247
1/20/2018	5:13:29 AM	40200.001	9.249
1/20/2018	5:18:29 AM	40500.001	9.246
1/20/2018	5:23:29 AM	40800.001	9.248
1/20/2018	5:28:29 AM	41100.001	9.249
1/20/2018	5:33:29 AM	41400.001	9.25
1/20/2018	5:38:29 AM	41700.001	9.252
1/20/2018	5:43:29 AM	42000.001	9.246
1/20/2018	5:48:29 AM	42300.001	9.247
1/20/2018	5:53:29 AM	42600.001	9.245

17PZ01 Ambient.txt

1/20/2018	5:58:29 AM	42900.001	9.242
1/20/2018	6:03:29 AM	43200.001	9.245
1/20/2018	6:08:29 AM	43500.001	9.244
1/20/2018	6:13:29 AM	43800.001	9.243
1/20/2018	6:18:29 AM	44100.001	9.244
1/20/2018	6:23:29 AM	44400.001	9.244
1/20/2018	6:28:29 AM	44700.001	9.25
1/20/2018	6:33:29 AM	45000.001	9.246
1/20/2018	6:38:29 AM	45300.001	9.245
1/20/2018	6:43:29 AM	45600.001	9.241
1/20/2018	6:48:29 AM	45900.001	9.24
1/20/2018	6:53:29 AM	46200.001	9.245
1/20/2018	6:58:29 AM	46500.001	9.244
1/20/2018	7:03:29 AM	46800.001	9.244
1/20/2018	7:08:29 AM	47100.001	9.241
1/20/2018	7:13:29 AM	47400.001	9.246
1/20/2018	7:18:29 AM	47700.001	9.243
1/20/2018	7:23:29 AM	48000.001	9.247
1/20/2018	7:28:29 AM	48300.001	9.244
1/20/2018	7:33:29 AM	48600.001	9.242
1/20/2018	7:38:29 AM	48900.001	9.243
1/20/2018	7:43:29 AM	49200.001	9.242
1/20/2018	7:48:29 AM	49500.001	9.242
1/20/2018	7:53:29 AM	49800.001	9.246
1/20/2018	7:58:29 AM	50100.001	9.241
1/20/2018	8:03:29 AM	50400.001	9.241
1/20/2018	8:08:29 AM	50700.001	9.238
1/20/2018	8:13:29 AM	51000.001	9.236
1/20/2018	8:18:29 AM	51300.001	9.242
1/20/2018	8:23:29 AM	51600.001	9.237
1/20/2018	8:28:29 AM	51900.001	9.236
1/20/2018	8:33:29 AM	52200.001	9.241
1/20/2018	8:38:29 AM	52500.001	9.237
1/20/2018	8:43:29 AM	52800.001	9.238
1/20/2018	8:48:29 AM	53100.001	9.238
1/20/2018	8:53:29 AM	53400.001	9.238
1/20/2018	8:58:29 AM	53700.001	9.236
1/20/2018	9:03:29 AM	54000.001	9.234
1/20/2018	9:08:29 AM	54300.001	9.231
1/20/2018	9:13:29 AM	54600.001	9.233
1/20/2018	9:18:29 AM	54900.001	9.235
1/20/2018	9:23:29 AM	55200.001	9.232
1/20/2018	9:28:29 AM	55500.001	9.233
1/20/2018	9:33:29 AM	55800.001	9.237
1/20/2018	9:38:29 AM	56100.001	9.234
1/20/2018	9:43:29 AM	56400.001	9.235
1/20/2018	9:48:29 AM	56700.001	9.236
1/20/2018	9:53:29 AM	57000.001	9.235

17PZ01 Ambient.txt

1/20/2018	9:58:29 AM	57300.001	9.23
1/20/2018	10:03:29 AM	57600.001	9.231
1/20/2018	10:08:29 AM	57900.001	9.231
1/20/2018	10:13:29 AM	58200.001	9.23
1/20/2018	10:18:29 AM	58500.001	9.23
1/20/2018	10:23:29 AM	58800.001	9.232
1/20/2018	10:28:29 AM	59100.001	9.231
1/20/2018	10:33:29 AM	59400.001	9.229
1/20/2018	10:38:29 AM	59700.001	9.229
1/20/2018	10:43:29 AM	60000.001	9.232
1/20/2018	10:48:29 AM	60300.001	9.231
1/20/2018	10:53:29 AM	60600.001	9.234
1/20/2018	10:58:29 AM	60900.001	9.235
1/20/2018	11:03:29 AM	61200.001	9.235
1/20/2018	11:08:29 AM	61500.001	9.231
1/20/2018	11:13:29 AM	61800.001	9.232
1/20/2018	11:18:29 AM	62100.001	9.233
1/20/2018	11:23:29 AM	62400.001	9.239
1/20/2018	11:28:29 AM	62700.001	9.23
1/20/2018	11:33:29 AM	63000.001	9.235
1/20/2018	11:38:29 AM	63300.001	9.237
1/20/2018	11:43:29 AM	63600.001	9.24
1/20/2018	11:48:29 AM	63900.001	9.235
1/20/2018	11:53:29 AM	64200.001	9.239
1/20/2018	11:58:29 AM	64500.001	9.245
1/20/2018	12:03:29 PM	64800.001	9.247
1/20/2018	12:08:29 PM	65100.001	9.25
1/20/2018	12:13:29 PM	65400.001	9.25
1/20/2018	12:18:29 PM	65700.001	9.246
1/20/2018	12:23:29 PM	66000.001	9.252
1/20/2018	12:28:29 PM	66300.001	9.25
1/20/2018	12:33:29 PM	66600.001	9.252
1/20/2018	12:38:29 PM	66900.001	9.256
1/20/2018	12:43:29 PM	67200.001	9.254
1/20/2018	12:48:29 PM	67500.001	9.253
1/20/2018	12:53:29 PM	67800.001	9.252
1/20/2018	12:58:29 PM	68100.001	9.256
1/20/2018	1:03:29 PM	68400.001	9.256
1/20/2018	1:08:29 PM	68700.001	9.257
1/20/2018	1:13:29 PM	69000.001	9.258
1/20/2018	1:18:29 PM	69300.001	9.261
1/20/2018	1:23:29 PM	69600.001	9.26
1/20/2018	1:28:29 PM	69900.001	9.261
1/20/2018	1:33:29 PM	70200.001	9.258
1/20/2018	1:38:29 PM	70500.001	9.262
1/20/2018	1:43:29 PM	70800.001	9.26
1/20/2018	1:48:29 PM	71100.001	9.265
1/20/2018	1:53:29 PM	71400.001	9.264

17PZ01 Ambient.txt

1/20/2018	1:58:29 PM	71700.001	9.26
1/20/2018	2:03:29 PM	72000.001	9.266
1/20/2018	2:08:29 PM	72300.001	9.264
1/20/2018	2:13:29 PM	72600.001	9.266
1/20/2018	2:18:29 PM	72900.001	9.261
1/20/2018	2:23:29 PM	73200.001	9.265
1/20/2018	2:28:29 PM	73500.001	9.263
1/20/2018	2:33:29 PM	73800.001	9.267
1/20/2018	2:38:29 PM	74100.001	9.265
1/20/2018	2:43:29 PM	74400.001	9.267
1/20/2018	2:48:29 PM	74700.001	9.265
1/20/2018	2:53:29 PM	75000.001	9.265
1/20/2018	2:58:29 PM	75300.001	9.267
1/20/2018	3:03:29 PM	75600.001	9.262
1/20/2018	3:08:29 PM	75900.001	9.261
1/20/2018	3:13:29 PM	76200.001	9.261
1/20/2018	3:18:29 PM	76500.001	9.266
1/20/2018	3:23:29 PM	76800.001	9.269
1/20/2018	3:28:29 PM	77100.001	9.27
1/20/2018	3:33:29 PM	77400.001	9.264
1/20/2018	3:38:29 PM	77700.001	9.265
1/20/2018	3:43:29 PM	78000.001	9.264
1/20/2018	3:48:29 PM	78300.001	9.267
1/20/2018	3:53:29 PM	78600.001	9.264
1/20/2018	3:58:29 PM	78900.001	9.266
1/20/2018	4:03:29 PM	79200.001	9.266
1/20/2018	4:08:29 PM	79500.001	9.269
1/20/2018	4:13:29 PM	79800.001	9.264
1/20/2018	4:18:29 PM	80100.001	9.256
1/20/2018	4:23:29 PM	80400.001	9.265
1/20/2018	4:28:29 PM	80700.001	9.267
1/20/2018	4:33:29 PM	81000.001	9.267
1/20/2018	4:38:29 PM	81300.001	9.259
1/20/2018	4:43:29 PM	81600.001	9.267
1/20/2018	4:48:29 PM	81900.001	9.261
1/20/2018	4:53:29 PM	82200.001	9.258
1/20/2018	4:58:29 PM	82500.001	9.262
1/20/2018	5:03:29 PM	82800.001	9.263
1/20/2018	5:08:29 PM	83100.001	9.265
1/20/2018	5:13:29 PM	83400.001	9.265
1/20/2018	5:18:29 PM	83700.001	9.264
1/20/2018	5:23:29 PM	84000.001	9.263
1/20/2018	5:28:29 PM	84300.001	9.253
1/20/2018	5:33:29 PM	84600.001	9.254
1/20/2018	5:38:29 PM	84900.001	9.26
1/20/2018	5:43:29 PM	85200.001	9.26
1/20/2018	5:48:29 PM	85500.001	9.257
1/20/2018	5:53:29 PM	85800.001	9.259

17PZ01 Ambient.txt

1/20/2018	5:58:29 PM	86100.001	9.258
1/20/2018	6:03:29 PM	86400.001	9.258
1/20/2018	6:08:29 PM	86700.001	9.26
1/20/2018	6:13:29 PM	87000.001	9.263
1/20/2018	6:18:29 PM	87300.001	9.253
1/20/2018	6:23:29 PM	87600.001	9.25
1/20/2018	6:28:29 PM	87900.001	9.253
1/20/2018	6:33:29 PM	88200.001	9.254
1/20/2018	6:38:29 PM	88500.001	9.257
1/20/2018	6:43:29 PM	88800.001	9.254
1/20/2018	6:48:29 PM	89100.001	9.254
1/20/2018	6:53:29 PM	89400.001	9.249
1/20/2018	6:58:29 PM	89700.001	9.254
1/20/2018	7:03:29 PM	90000.001	9.254
1/20/2018	7:08:29 PM	90300.001	9.255
1/20/2018	7:13:29 PM	90600.001	9.256
1/20/2018	7:18:29 PM	90900.001	9.257
1/20/2018	7:23:29 PM	91200.001	9.254
1/20/2018	7:28:29 PM	91500.001	9.25
1/20/2018	7:33:29 PM	91800.001	9.251
1/20/2018	7:38:29 PM	92100.001	9.253
1/20/2018	7:43:29 PM	92400.001	9.253
1/20/2018	7:48:29 PM	92700.001	9.256
1/20/2018	7:53:29 PM	93000.001	9.254
1/20/2018	7:58:29 PM	93300.001	9.254
1/20/2018	8:03:29 PM	93600.001	9.251
1/20/2018	8:08:29 PM	93900.001	9.248
1/20/2018	8:13:29 PM	94200.001	9.248
1/20/2018	8:18:29 PM	94500.001	9.25
1/20/2018	8:23:29 PM	94800.001	9.25
1/20/2018	8:28:29 PM	95100.001	9.251
1/20/2018	8:33:29 PM	95400.001	9.247
1/20/2018	8:38:29 PM	95700.001	9.249
1/20/2018	8:43:29 PM	96000.001	9.251
1/20/2018	8:48:29 PM	96300.001	9.248
1/20/2018	8:53:29 PM	96600.001	9.253
1/20/2018	8:58:29 PM	96900.001	9.255
1/20/2018	9:03:29 PM	97200.001	9.25
1/20/2018	9:08:29 PM	97500.001	9.251
1/20/2018	9:13:29 PM	97800.001	9.251
1/20/2018	9:18:29 PM	98100.001	9.252
1/20/2018	9:23:29 PM	98400.001	9.253
1/20/2018	9:28:29 PM	98700.001	9.254
1/20/2018	9:33:29 PM	99000.001	9.256
1/20/2018	9:38:29 PM	99300.001	9.253
1/20/2018	9:43:29 PM	99600.001	9.253
1/20/2018	9:48:29 PM	99900.001	9.256
1/20/2018	9:53:29 PM	100200.001	9.255

17PZ01 Ambient.txt

1/20/2018	9:58:29 PM	100500.001	9.254
1/20/2018	10:03:29 PM	100800.001	9.255
1/20/2018	10:08:29 PM	101100.001	9.254
1/20/2018	10:13:29 PM	101400.001	9.251
1/20/2018	10:18:29 PM	101700.001	9.252
1/20/2018	10:23:29 PM	102000.001	9.255
1/20/2018	10:28:29 PM	102300.001	9.254
1/20/2018	10:33:29 PM	102600.001	9.254
1/20/2018	10:38:29 PM	102900.001	9.256
1/20/2018	10:43:29 PM	103200.001	9.252
1/20/2018	10:48:29 PM	103500.001	9.252
1/20/2018	10:53:29 PM	103800.001	9.252
1/20/2018	10:58:29 PM	104100.001	9.253
1/20/2018	11:03:29 PM	104400.001	9.252
1/20/2018	11:08:29 PM	104700.001	9.256
1/20/2018	11:13:29 PM	105000.001	9.254
1/20/2018	11:18:29 PM	105300.001	9.254
1/20/2018	11:23:29 PM	105600.001	9.253
1/20/2018	11:28:29 PM	105900.001	9.254
1/20/2018	11:33:29 PM	106200.001	9.256
1/20/2018	11:38:29 PM	106500.001	9.254
1/20/2018	11:43:29 PM	106800.001	9.255
1/20/2018	11:48:29 PM	107100.001	9.253
1/20/2018	11:53:29 PM	107400.001	9.251
1/20/2018	11:58:29 PM	107700.001	9.251
1/21/2018	12:03:29 AM	108000.001	9.252
1/21/2018	12:08:29 AM	108300.001	9.256
1/21/2018	12:13:29 AM	108600.001	9.255
1/21/2018	12:18:29 AM	108900.001	9.253
1/21/2018	12:23:29 AM	109200.001	9.255
1/21/2018	12:28:29 AM	109500.001	9.256
1/21/2018	12:33:29 AM	109800.001	9.25
1/21/2018	12:38:29 AM	110100.001	9.254
1/21/2018	12:43:29 AM	110400.001	9.255
1/21/2018	12:48:29 AM	110700.001	9.253
1/21/2018	12:53:29 AM	111000.001	9.251
1/21/2018	12:58:29 AM	111300.001	9.253
1/21/2018	1:03:29 AM	111600.001	9.25
1/21/2018	1:08:29 AM	111900.001	9.257
1/21/2018	1:13:29 AM	112200.001	9.252
1/21/2018	1:18:29 AM	112500.001	9.254
1/21/2018	1:23:29 AM	112800.001	9.255
1/21/2018	1:28:29 AM	113100.001	9.254
1/21/2018	1:33:29 AM	113400.001	9.255
1/21/2018	1:38:29 AM	113700.001	9.252
1/21/2018	1:43:29 AM	114000.001	9.253
1/21/2018	1:48:29 AM	114300.001	9.255
1/21/2018	1:53:29 AM	114600.001	9.254

17PZ01 Ambient.txt

1/21/2018	1:58:29 AM	114900.001	9.254
1/21/2018	2:03:29 AM	115200.001	9.252
1/21/2018	2:08:29 AM	115500.001	9.249
1/21/2018	2:13:29 AM	115800.001	9.255
1/21/2018	2:18:29 AM	116100.001	9.256
1/21/2018	2:23:29 AM	116400.001	9.253
1/21/2018	2:28:29 AM	116700.001	9.253
1/21/2018	2:33:29 AM	117000.001	9.255
1/21/2018	2:38:29 AM	117300.001	9.254
1/21/2018	2:43:29 AM	117600.001	9.259
1/21/2018	2:48:29 AM	117900.001	9.254
1/21/2018	2:53:29 AM	118200.001	9.252
1/21/2018	2:58:29 AM	118500.001	9.256
1/21/2018	3:03:29 AM	118800.001	9.261
1/21/2018	3:08:29 AM	119100.001	9.261
1/21/2018	3:13:29 AM	119400.001	9.262
1/21/2018	3:18:29 AM	119700.001	9.26
1/21/2018	3:23:29 AM	120000.001	9.264
1/21/2018	3:28:29 AM	120300.001	9.259
1/21/2018	3:33:29 AM	120600.001	9.257
1/21/2018	3:38:29 AM	120900.001	9.257
1/21/2018	3:43:29 AM	121200.001	9.257
1/21/2018	3:48:29 AM	121500.001	9.262
1/21/2018	3:53:29 AM	121800.001	9.258
1/21/2018	3:58:29 AM	122100.001	9.26
1/21/2018	4:03:29 AM	122400.001	9.26
1/21/2018	4:08:29 AM	122700.001	9.264
1/21/2018	4:13:29 AM	123000.001	9.262
1/21/2018	4:18:29 AM	123300.001	9.261
1/21/2018	4:23:29 AM	123600.001	9.263
1/21/2018	4:28:29 AM	123900.001	9.259
1/21/2018	4:33:29 AM	124200.001	9.261
1/21/2018	4:38:29 AM	124500.001	9.255
1/21/2018	4:43:29 AM	124800.001	9.258
1/21/2018	4:48:29 AM	125100.001	9.255
1/21/2018	4:53:29 AM	125400.001	9.26
1/21/2018	4:58:29 AM	125700.001	9.256
1/21/2018	5:03:29 AM	126000.001	9.259
1/21/2018	5:08:29 AM	126300.001	9.256
1/21/2018	5:13:29 AM	126600.001	9.257
1/21/2018	5:18:29 AM	126900.001	9.256
1/21/2018	5:23:29 AM	127200.001	9.253
1/21/2018	5:28:29 AM	127500.001	9.257
1/21/2018	5:33:29 AM	127800.001	9.257
1/21/2018	5:38:29 AM	128100.001	9.256
1/21/2018	5:43:29 AM	128400.001	9.256
1/21/2018	5:48:29 AM	128700.001	9.258
1/21/2018	5:53:29 AM	129000.001	9.258

17PZ01 Ambient.txt

1/21/2018	5:58:29 AM	129300.001	9.261
1/21/2018	6:03:29 AM	129600.001	9.259
1/21/2018	6:08:29 AM	129900.001	9.259
1/21/2018	6:13:29 AM	130200.001	9.259
1/21/2018	6:18:29 AM	130500.001	9.259
1/21/2018	6:23:29 AM	130800.001	9.26
1/21/2018	6:28:29 AM	131100.001	9.261
1/21/2018	6:33:29 AM	131400.001	9.258
1/21/2018	6:38:29 AM	131700.001	9.259
1/21/2018	6:43:29 AM	132000.001	9.254
1/21/2018	6:48:29 AM	132300.001	9.258
1/21/2018	6:53:29 AM	132600.001	9.259
1/21/2018	6:58:29 AM	132900.001	9.259
1/21/2018	7:03:29 AM	133200.001	9.254
1/21/2018	7:08:29 AM	133500.001	9.256
1/21/2018	7:13:29 AM	133800.001	9.257
1/21/2018	7:18:29 AM	134100.001	9.255
1/21/2018	7:23:29 AM	134400.001	9.254
1/21/2018	7:28:29 AM	134700.001	9.252
1/21/2018	7:33:29 AM	135000.001	9.257
1/21/2018	7:38:29 AM	135300.001	9.255
1/21/2018	7:43:29 AM	135600.001	9.253
1/21/2018	7:48:29 AM	135900.001	9.257
1/21/2018	7:53:29 AM	136200.001	9.257
1/21/2018	7:58:29 AM	136500.001	9.257
1/21/2018	8:03:29 AM	136800.001	9.255
1/21/2018	8:08:29 AM	137100.001	9.249
1/21/2018	8:13:29 AM	137400.001	9.253
1/21/2018	8:18:29 AM	137700.001	9.254
1/21/2018	8:23:29 AM	138000.001	9.256
1/21/2018	8:28:29 AM	138300.001	9.256
1/21/2018	8:33:29 AM	138600.001	9.256
1/21/2018	8:38:29 AM	138900.001	9.255
1/21/2018	8:43:29 AM	139200.001	9.255
1/21/2018	8:48:29 AM	139500.001	9.254
1/21/2018	8:53:29 AM	139800.001	9.25
1/21/2018	8:58:29 AM	140100.001	9.256
1/21/2018	9:03:29 AM	140400.001	9.254
1/21/2018	9:08:29 AM	140700.001	9.251
1/21/2018	9:13:29 AM	141000.001	9.245
1/21/2018	9:18:29 AM	141300.001	9.248
1/21/2018	9:23:29 AM	141600.001	9.246
1/21/2018	9:28:29 AM	141900.001	9.243
1/21/2018	9:33:29 AM	142200.001	9.246
1/21/2018	9:38:29 AM	142500.001	9.248
1/21/2018	9:43:29 AM	142800.001	9.241
1/21/2018	9:48:29 AM	143100.001	9.244
1/21/2018	9:53:29 AM	143400.001	9.245

17PZ01 Ambient.txt

1/21/2018	9:58:29 AM	143700.001	9.239
1/21/2018	10:03:29 AM	144000.001	9.24
1/21/2018	10:08:29 AM	144300.001	9.241
1/21/2018	10:13:29 AM	144600.001	9.24
1/21/2018	10:18:29 AM	144900.001	9.24
1/21/2018	10:23:29 AM	145200.001	9.245
1/21/2018	10:28:29 AM	145500.001	9.243
1/21/2018	10:33:29 AM	145800.001	9.238
1/21/2018	10:38:29 AM	146100.001	9.244
1/21/2018	10:43:29 AM	146400.001	9.244
1/21/2018	10:48:29 AM	146700.001	9.245
1/21/2018	10:53:29 AM	147000.001	9.247
1/21/2018	10:58:29 AM	147300.001	9.249
1/21/2018	11:03:29 AM	147600.001	9.246
1/21/2018	11:08:29 AM	147900.001	9.246
1/21/2018	11:13:29 AM	148200.001	9.25
1/21/2018	11:18:29 AM	148500.001	9.254
1/21/2018	11:23:29 AM	148800.001	9.25
1/21/2018	11:28:29 AM	149100.001	9.257
1/21/2018	11:33:29 AM	149400.001	9.257
1/21/2018	11:38:29 AM	149700.001	9.254
1/21/2018	11:43:29 AM	150000.001	9.255
1/21/2018	11:48:29 AM	150300.001	9.257
1/21/2018	11:53:29 AM	150600.001	9.259
1/21/2018	11:58:29 AM	150900.001	9.26
1/21/2018	12:03:29 PM	151200.001	9.262
1/21/2018	12:08:29 PM	151500.001	9.261
1/21/2018	12:13:29 PM	151800.001	9.265
1/21/2018	12:18:29 PM	152100.001	9.269
1/21/2018	12:23:29 PM	152400.001	9.267
1/21/2018	12:28:29 PM	152700.001	9.267
1/21/2018	12:33:29 PM	153000.001	9.269
1/21/2018	12:38:29 PM	153300.001	9.269
1/21/2018	12:43:29 PM	153600.001	9.269
1/21/2018	12:48:29 PM	153900.001	9.267
1/21/2018	12:53:29 PM	154200.001	9.275
1/21/2018	12:58:29 PM	154500.001	9.275
1/21/2018	1:03:29 PM	154800.001	9.274
1/21/2018	1:08:29 PM	155100.001	9.28
1/21/2018	1:13:29 PM	155400.001	9.281
1/21/2018	1:18:29 PM	155700.001	9.284
1/21/2018	1:23:29 PM	156000.001	9.283
1/21/2018	1:28:29 PM	156300.001	9.283
1/21/2018	1:33:29 PM	156600.001	9.281
1/21/2018	1:38:29 PM	156900.001	9.284
1/21/2018	1:43:29 PM	157200.001	9.28
1/21/2018	1:48:29 PM	157500.001	9.276
1/21/2018	1:53:29 PM	157800.001	9.282

17PZ01 Ambient.txt

1/21/2018	1:58:29 PM	158100.001	9.288
1/21/2018	2:03:29 PM	158400.001	9.286
1/21/2018	2:08:29 PM	158700.001	9.287
1/21/2018	2:13:29 PM	159000.001	9.291
1/21/2018	2:18:29 PM	159300.001	9.287
1/21/2018	2:23:29 PM	159600.001	9.29
1/21/2018	2:28:29 PM	159900.001	9.29
1/21/2018	2:33:29 PM	160200.001	9.289
1/21/2018	2:38:29 PM	160500.001	9.296
1/21/2018	2:43:29 PM	160800.001	9.291
1/21/2018	2:48:29 PM	161100.001	9.294
1/21/2018	2:53:29 PM	161400.001	9.296
1/21/2018	2:58:29 PM	161700.001	9.29
1/21/2018	3:03:29 PM	162000.001	9.289
1/21/2018	3:08:29 PM	162300.001	9.29
1/21/2018	3:13:29 PM	162600.001	9.294
1/21/2018	3:18:29 PM	162900.001	9.288
1/21/2018	3:23:29 PM	163200.001	9.284
1/21/2018	3:28:29 PM	163500.001	9.289
1/21/2018	3:33:29 PM	163800.001	9.288
1/21/2018	3:38:29 PM	164100.001	9.291
1/21/2018	3:43:29 PM	164400.001	9.293
1/21/2018	3:48:29 PM	164700.001	9.285
1/21/2018	3:53:29 PM	165000.001	9.286
1/21/2018	3:58:29 PM	165300.001	9.293
1/21/2018	4:03:29 PM	165600.001	9.292
1/21/2018	4:08:29 PM	165900.001	9.295
1/21/2018	4:13:29 PM	166200.001	9.294
1/21/2018	4:18:29 PM	166500.001	9.287
1/21/2018	4:23:29 PM	166800.001	9.294
1/21/2018	4:28:29 PM	167100.001	9.288
1/21/2018	4:33:29 PM	167400.001	9.295
1/21/2018	4:38:29 PM	167700.001	9.296
1/21/2018	4:43:29 PM	168000.001	9.292
1/21/2018	4:48:29 PM	168300.001	9.296
1/21/2018	4:53:29 PM	168600.001	9.294
1/21/2018	4:58:29 PM	168900.001	9.297
1/21/2018	5:03:29 PM	169200.001	9.293
1/21/2018	5:08:29 PM	169500.001	9.293
1/21/2018	5:13:29 PM	169800.001	9.293
1/21/2018	5:18:29 PM	170100.001	9.295
1/21/2018	5:23:29 PM	170400.001	9.289
1/21/2018	5:28:29 PM	170700.001	9.293
1/21/2018	5:33:29 PM	171000.001	9.292
1/21/2018	5:38:29 PM	171300.001	9.291
1/21/2018	5:43:29 PM	171600.001	9.289
1/21/2018	5:48:29 PM	171900.001	9.29
1/21/2018	5:53:29 PM	172200.001	9.292

17PZ01 Ambient.txt

1/21/2018	5:58:29 PM	172500.001	9.29
1/21/2018	6:03:29 PM	172800.001	9.293
1/21/2018	6:08:29 PM	173100.001	9.293
1/21/2018	6:13:29 PM	173400.001	9.293
1/21/2018	6:18:29 PM	173700.001	9.296
1/21/2018	6:23:29 PM	174000.001	9.291
1/21/2018	6:28:29 PM	174300.001	9.296
1/21/2018	6:33:29 PM	174600.001	9.297
1/21/2018	6:38:29 PM	174900.001	9.294
1/21/2018	6:43:29 PM	175200.001	9.299
1/21/2018	6:48:29 PM	175500.001	9.301
1/21/2018	6:53:29 PM	175800.001	9.293
1/21/2018	6:58:29 PM	176100.001	9.293
1/21/2018	7:03:29 PM	176400.001	9.295
1/21/2018	7:08:29 PM	176700.001	9.291
1/21/2018	7:13:29 PM	177000.001	9.289
1/21/2018	7:18:29 PM	177300.001	9.294
1/21/2018	7:23:29 PM	177600.001	9.294
1/21/2018	7:28:29 PM	177900.001	9.29
1/21/2018	7:33:29 PM	178200.001	9.292
1/21/2018	7:38:29 PM	178500.001	9.292
1/21/2018	7:43:29 PM	178800.001	9.298
1/21/2018	7:48:29 PM	179100.001	9.293
1/21/2018	7:53:29 PM	179400.001	9.298
1/21/2018	7:58:29 PM	179700.001	9.295
1/21/2018	8:03:29 PM	180000.001	9.298
1/21/2018	8:08:29 PM	180300.001	9.301
1/21/2018	8:13:29 PM	180600.001	9.307
1/21/2018	8:18:29 PM	180900.001	9.305
1/21/2018	8:23:29 PM	181200.001	9.303
1/21/2018	8:28:29 PM	181500.001	9.303
1/21/2018	8:33:29 PM	181800.001	9.305
1/21/2018	8:38:29 PM	182100.001	9.305
1/21/2018	8:43:29 PM	182400.001	9.306
1/21/2018	8:48:29 PM	182700.001	9.301
1/21/2018	8:53:29 PM	183000.001	9.299
1/21/2018	8:58:29 PM	183300.001	9.302
1/21/2018	9:03:29 PM	183600.001	9.306
1/21/2018	9:08:29 PM	183900.001	9.313
1/21/2018	9:13:29 PM	184200.001	9.311
1/21/2018	9:18:29 PM	184500.001	9.304
1/21/2018	9:23:29 PM	184800.001	9.31
1/21/2018	9:28:29 PM	185100.001	9.314
1/21/2018	9:33:29 PM	185400.001	9.308
1/21/2018	9:38:29 PM	185700.001	9.305
1/21/2018	9:43:29 PM	186000.001	9.304
1/21/2018	9:48:29 PM	186300.001	9.305
1/21/2018	9:53:29 PM	186600.001	9.303

17PZ01 Ambient.txt

1/21/2018	9:58:29 PM	186900.001	9.298
1/21/2018	10:03:29 PM	187200.001	9.302
1/21/2018	10:08:29 PM	187500.001	9.298
1/21/2018	10:13:29 PM	187800.001	9.302
1/21/2018	10:18:29 PM	188100.001	9.306
1/21/2018	10:23:29 PM	188400.001	9.303
1/21/2018	10:28:29 PM	188700.001	9.302
1/21/2018	10:33:29 PM	189000.001	9.3
1/21/2018	10:38:29 PM	189300.001	9.303
1/21/2018	10:43:29 PM	189600.001	9.304
1/21/2018	10:48:29 PM	189900.001	9.303
1/21/2018	10:53:29 PM	190200.001	9.305
1/21/2018	10:58:29 PM	190500.001	9.303
1/21/2018	11:03:29 PM	190800.001	9.307
1/21/2018	11:08:29 PM	191100.001	9.31
1/21/2018	11:13:29 PM	191400.001	9.306
1/21/2018	11:18:29 PM	191700.001	9.309
1/21/2018	11:23:29 PM	192000.001	9.307
1/21/2018	11:28:29 PM	192300.001	9.309
1/21/2018	11:33:29 PM	192600.001	9.311
1/21/2018	11:38:29 PM	192900.001	9.313
1/21/2018	11:43:29 PM	193200.001	9.318
1/21/2018	11:48:29 PM	193500.001	9.316
1/21/2018	11:53:29 PM	193800.001	9.311
1/21/2018	11:58:29 PM	194100.001	9.314
1/22/2018	12:03:29 AM	194400.001	9.308
1/22/2018	12:08:29 AM	194700.001	9.308
1/22/2018	12:13:29 AM	195000.001	9.306
1/22/2018	12:18:29 AM	195300.001	9.301
1/22/2018	12:23:29 AM	195600.001	9.304
1/22/2018	12:28:29 AM	195900.001	9.297
1/22/2018	12:33:29 AM	196200.001	9.304
1/22/2018	12:38:29 AM	196500.001	9.298
1/22/2018	12:43:29 AM	196800.001	9.295
1/22/2018	12:48:29 AM	197100.001	9.302
1/22/2018	12:53:29 AM	197400.001	9.306
1/22/2018	12:58:29 AM	197700.001	9.307
1/22/2018	1:03:29 AM	198000.001	9.308
1/22/2018	1:08:29 AM	198300.001	9.304
1/22/2018	1:13:29 AM	198600.001	9.305
1/22/2018	1:18:29 AM	198900.001	9.302
1/22/2018	1:23:29 AM	199200.001	9.304
1/22/2018	1:28:29 AM	199500.001	9.308
1/22/2018	1:33:29 AM	199800.001	9.3
1/22/2018	1:38:29 AM	200100.001	9.293
1/22/2018	1:43:29 AM	200400.001	9.295
1/22/2018	1:48:29 AM	200700.001	9.289
1/22/2018	1:53:29 AM	201000.001	9.293

17PZ01 Ambient.txt

1/22/2018	1:58:29 AM	201300.001	9.294
1/22/2018	2:03:29 AM	201600.001	9.297
1/22/2018	2:08:29 AM	201900.001	9.296
1/22/2018	2:13:29 AM	202200.001	9.295
1/22/2018	2:18:29 AM	202500.001	9.295
1/22/2018	2:23:29 AM	202800.001	9.298
1/22/2018	2:28:29 AM	203100.001	9.296
1/22/2018	2:33:29 AM	203400.001	9.3
1/22/2018	2:38:29 AM	203700.001	9.3
1/22/2018	2:43:29 AM	204000.001	9.298
1/22/2018	2:48:29 AM	204300.001	9.299
1/22/2018	2:53:29 AM	204600.001	9.294
1/22/2018	2:58:29 AM	204900.001	9.293
1/22/2018	3:03:29 AM	205200.001	9.295
1/22/2018	3:08:29 AM	205500.001	9.298
1/22/2018	3:13:29 AM	205800.001	9.3
1/22/2018	3:18:29 AM	206100.001	9.299
1/22/2018	3:23:29 AM	206400.001	9.296
1/22/2018	3:28:29 AM	206700.001	9.297
1/22/2018	3:33:29 AM	207000.001	9.298
1/22/2018	3:38:29 AM	207300.001	9.296
1/22/2018	3:43:29 AM	207600.001	9.294
1/22/2018	3:48:29 AM	207900.001	9.295
1/22/2018	3:53:29 AM	208200.001	9.289
1/22/2018	3:58:29 AM	208500.001	9.292
1/22/2018	4:03:29 AM	208800.001	9.293
1/22/2018	4:08:29 AM	209100.001	9.287
1/22/2018	4:13:29 AM	209400.001	9.289
1/22/2018	4:18:29 AM	209700.001	9.287
1/22/2018	4:23:29 AM	210000.001	9.285
1/22/2018	4:28:29 AM	210300.001	9.291
1/22/2018	4:33:29 AM	210600.001	9.287
1/22/2018	4:38:29 AM	210900.001	9.288
1/22/2018	4:43:29 AM	211200.001	9.29
1/22/2018	4:48:29 AM	211500.001	9.288
1/22/2018	4:53:29 AM	211800.001	9.282
1/22/2018	4:58:29 AM	212100.001	9.289
1/22/2018	5:03:29 AM	212400.001	9.288
1/22/2018	5:08:29 AM	212700.001	9.287
1/22/2018	5:13:29 AM	213000.001	9.281
1/22/2018	5:18:29 AM	213300.001	9.28
1/22/2018	5:23:29 AM	213600.001	9.286
1/22/2018	5:28:29 AM	213900.001	9.284
1/22/2018	5:33:29 AM	214200.001	9.276
1/22/2018	5:38:29 AM	214500.001	9.278
1/22/2018	5:43:29 AM	214800.001	9.274
1/22/2018	5:48:29 AM	215100.001	9.275
1/22/2018	5:53:29 AM	215400.001	9.274

17PZ01 Ambient.txt

1/22/2018	5:58:29 AM	215700.001	9.273
1/22/2018	6:03:29 AM	216000.001	9.27
1/22/2018	6:08:29 AM	216300.001	9.269
1/22/2018	6:13:29 AM	216600.001	9.265
1/22/2018	6:18:29 AM	216900.001	9.268
1/22/2018	6:23:29 AM	217200.001	9.27
1/22/2018	6:28:29 AM	217500.001	9.265
1/22/2018	6:33:29 AM	217800.001	9.27
1/22/2018	6:38:29 AM	218100.001	9.265
1/22/2018	6:43:29 AM	218400.001	9.267
1/22/2018	6:48:29 AM	218700.001	9.268
1/22/2018	6:53:29 AM	219000.001	9.266
1/22/2018	6:58:29 AM	219300.001	9.267
1/22/2018	7:03:29 AM	219600.001	9.265
1/22/2018	7:08:29 AM	219900.001	9.265
1/22/2018	7:13:29 AM	220200.001	9.263
1/22/2018	7:18:29 AM	220500.001	9.261
1/22/2018	7:23:29 AM	220800.001	9.261
1/22/2018	7:28:29 AM	221100.001	9.264
1/22/2018	7:33:29 AM	221400.001	9.256
1/22/2018	7:38:29 AM	221700.001	9.261
1/22/2018	7:43:29 AM	222000.001	9.258
1/22/2018	7:48:29 AM	222300.001	9.258
1/22/2018	7:53:29 AM	222600.001	9.255
1/22/2018	7:58:29 AM	222900.001	9.254
1/22/2018	8:03:29 AM	223200.001	9.252
1/22/2018	8:08:29 AM	223500.001	9.253
1/22/2018	8:13:29 AM	223800.001	9.249
1/22/2018	8:18:29 AM	224100.001	9.246
1/22/2018	8:23:29 AM	224400.001	9.249
1/22/2018	8:28:29 AM	224700.001	9.245
1/22/2018	8:33:29 AM	225000.001	9.247
1/22/2018	8:38:29 AM	225300.001	9.247
1/22/2018	8:43:29 AM	225600.001	9.242
1/22/2018	8:48:29 AM	225900.001	9.24
1/22/2018	8:53:29 AM	226200.001	9.242
1/22/2018	8:58:29 AM	226500.001	9.243
1/22/2018	9:03:29 AM	226800.001	9.242
1/22/2018	9:08:29 AM	227100.001	9.248
1/22/2018	9:13:29 AM	227400.001	9.238
1/22/2018	9:18:29 AM	227700.001	9.242
1/22/2018	9:23:29 AM	228000.001	9.237
1/22/2018	9:28:29 AM	228300.001	9.234
1/22/2018	9:33:29 AM	228600.001	9.236
1/22/2018	9:38:29 AM	228900.001	9.239
1/22/2018	9:43:29 AM	229200.001	9.244
1/22/2018	9:48:29 AM	229500.001	9.233
1/22/2018	9:53:29 AM	229800.001	9.233

17PZ01 Ambient.txt			
1/22/2018	9:58:29 AM	230100	9.235
1/22/2018	10:03:29 AM	230400	9.242
1/22/2018	10:08:29 AM	230700.001	9.234
1/22/2018	10:13:29 AM	231000.001	9.248
1/22/2018	10:18:29 AM	231300.001	9.233
1/22/2018	10:23:29 AM	231600.001	9.241
1/22/2018	10:28:29 AM	231900.001	9.238
1/22/2018	10:33:29 AM	232200.001	9.244
1/22/2018	10:38:29 AM	232500.001	9.234
1/22/2018	10:43:29 AM	232800.001	9.24

Date	Time	Seconds	17PZ02 Ambient.txt	
			Depth (ft)	
1/19/2018	6:08:56 PM	0	9.728	
1/19/2018	6:13:56 PM	300	9.728	
1/19/2018	6:18:56 PM	600	9.727	
1/19/2018	6:23:56 PM	900	9.723	
1/19/2018	6:28:56 PM	1200	9.724	
1/19/2018	6:33:56 PM	1500	9.724	
1/19/2018	6:38:56 PM	1800	9.719	
1/19/2018	6:43:56 PM	2100	9.713	
1/19/2018	6:48:56 PM	2400	9.713	
1/19/2018	6:53:56 PM	2700	9.712	
1/19/2018	6:58:56 PM	3000	9.712	
1/19/2018	7:03:56 PM	3300	9.709	
1/19/2018	7:08:56 PM	3600	9.712	
1/19/2018	7:13:56 PM	3900	9.716	
1/19/2018	7:18:56 PM	4200	9.708	
1/19/2018	7:23:56 PM	4500	9.715	
1/19/2018	7:28:56 PM	4800	9.716	
1/19/2018	7:33:56 PM	5100	9.714	
1/19/2018	7:38:56 PM	5400	9.713	
1/19/2018	7:43:56 PM	5700	9.713	
1/19/2018	7:48:56 PM	6000	9.713	
1/19/2018	7:53:56 PM	6300	9.715	
1/19/2018	7:58:56 PM	6600	9.71	
1/19/2018	8:03:56 PM	6900	9.707	
1/19/2018	8:08:56 PM	7200	9.71	
1/19/2018	8:13:56 PM	7500	9.708	
1/19/2018	8:18:56 PM	7800	9.708	
1/19/2018	8:23:56 PM	8100	9.709	
1/19/2018	8:28:56 PM	8400	9.712	
1/19/2018	8:33:56 PM	8700	9.71	
1/19/2018	8:38:56 PM	9000	9.713	
1/19/2018	8:43:56 PM	9300	9.709	
1/19/2018	8:48:56 PM	9600	9.711	
1/19/2018	8:53:56 PM	9900	9.709	
1/19/2018	8:58:56 PM	10200	9.706	
1/19/2018	9:03:56 PM	10500	9.706	
1/19/2018	9:08:56 PM	10800	9.705	
1/19/2018	9:13:56 PM	11100	9.71	
1/19/2018	9:18:56 PM	11400	9.71	
1/19/2018	9:23:56 PM	11700	9.71	
1/19/2018	9:28:56 PM	12000	9.708	
1/19/2018	9:33:56 PM	12300	9.708	
1/19/2018	9:38:56 PM	12600	9.707	
1/19/2018	9:43:56 PM	12900	9.709	
1/19/2018	9:48:56 PM	13200	9.71	
1/19/2018	9:53:56 PM	13500	9.706	
1/19/2018	9:58:56 PM	13800	9.703	

17PZ02 Ambient.txt

1/19/2018	10:03:56 PM	14100	9.708
1/19/2018	10:08:56 PM	14400	9.702
1/19/2018	10:13:56 PM	14700	9.702
1/19/2018	10:18:56 PM	15000	9.707
1/19/2018	10:23:56 PM	15300	9.706
1/19/2018	10:28:56 PM	15600	9.705
1/19/2018	10:33:56 PM	15900	9.705
1/19/2018	10:38:56 PM	16200	9.705
1/19/2018	10:43:56 PM	16500	9.702
1/19/2018	10:48:56 PM	16800	9.702
1/19/2018	10:53:56 PM	17100	9.706
1/19/2018	10:58:56 PM	17400	9.707
1/19/2018	11:03:56 PM	17700	9.706
1/19/2018	11:08:56 PM	18000	9.704
1/19/2018	11:13:56 PM	18300	9.702
1/19/2018	11:18:56 PM	18600	9.708
1/19/2018	11:23:56 PM	18900	9.705
1/19/2018	11:28:56 PM	19200	9.703
1/19/2018	11:33:56 PM	19500	9.706
1/19/2018	11:38:56 PM	19800	9.706
1/19/2018	11:43:56 PM	20100	9.707
1/19/2018	11:48:56 PM	20400	9.705
1/19/2018	11:53:56 PM	20700	9.704
1/19/2018	11:58:56 PM	21000	9.706
1/20/2018	12:03:56 AM	21300	9.703
1/20/2018	12:08:56 AM	21600	9.707
1/20/2018	12:13:56 AM	21900	9.708
1/20/2018	12:18:56 AM	22200	9.709
1/20/2018	12:23:56 AM	22500	9.709
1/20/2018	12:28:56 AM	22800	9.709
1/20/2018	12:33:56 AM	23100	9.708
1/20/2018	12:38:56 AM	23400	9.715
1/20/2018	12:43:56 AM	23700	9.708
1/20/2018	12:48:56 AM	24000	9.706
1/20/2018	12:53:56 AM	24300	9.71
1/20/2018	12:58:56 AM	24600	9.706
1/20/2018	1:03:56 AM	24900	9.709
1/20/2018	1:08:56 AM	25200	9.71
1/20/2018	1:13:56 AM	25500	9.714
1/20/2018	1:18:56 AM	25800	9.711
1/20/2018	1:23:56 AM	26100	9.716
1/20/2018	1:28:56 AM	26400	9.711
1/20/2018	1:33:56 AM	26700	9.713
1/20/2018	1:38:56 AM	27000	9.711
1/20/2018	1:43:56 AM	27300	9.715
1/20/2018	1:48:56 AM	27600	9.716
1/20/2018	1:53:56 AM	27900	9.712
1/20/2018	1:58:56 AM	28200	9.716

17PZ02 Ambient.txt

1/20/2018	2:03:56 AM	28500	9.717
1/20/2018	2:08:56 AM	28800	9.716
1/20/2018	2:13:56 AM	29100	9.717
1/20/2018	2:18:56 AM	29400	9.714
1/20/2018	2:23:56 AM	29700	9.716
1/20/2018	2:28:56 AM	30000	9.717
1/20/2018	2:33:56 AM	30300	9.712
1/20/2018	2:38:56 AM	30600	9.718
1/20/2018	2:43:56 AM	30900	9.717
1/20/2018	2:48:56 AM	31200	9.716
1/20/2018	2:53:56 AM	31500	9.723
1/20/2018	2:58:56 AM	31800	9.717
1/20/2018	3:03:56 AM	32100	9.716
1/20/2018	3:08:56 AM	32400	9.721
1/20/2018	3:13:56 AM	32700	9.718
1/20/2018	3:18:56 AM	33000	9.718
1/20/2018	3:23:56 AM	33300	9.721
1/20/2018	3:28:56 AM	33600	9.718
1/20/2018	3:33:56 AM	33900	9.719
1/20/2018	3:38:56 AM	34200	9.718
1/20/2018	3:43:56 AM	34500	9.719
1/20/2018	3:48:56 AM	34800	9.716
1/20/2018	3:53:56 AM	35100	9.716
1/20/2018	3:58:56 AM	35400	9.721
1/20/2018	4:03:56 AM	35700	9.721
1/20/2018	4:08:56 AM	36000	9.719
1/20/2018	4:13:56 AM	36300	9.716
1/20/2018	4:18:56 AM	36600	9.719
1/20/2018	4:23:56 AM	36900	9.72
1/20/2018	4:28:56 AM	37200	9.719
1/20/2018	4:33:56 AM	37500	9.719
1/20/2018	4:38:56 AM	37800	9.721
1/20/2018	4:43:56 AM	38100	9.717
1/20/2018	4:48:56 AM	38400	9.723
1/20/2018	4:53:56 AM	38700	9.723
1/20/2018	4:58:56 AM	39000	9.72
1/20/2018	5:03:56 AM	39300	9.719
1/20/2018	5:08:56 AM	39600	9.717
1/20/2018	5:13:56 AM	39900	9.72
1/20/2018	5:18:56 AM	40200	9.719
1/20/2018	5:23:56 AM	40500	9.72
1/20/2018	5:28:56 AM	40800	9.719
1/20/2018	5:33:56 AM	41100	9.719
1/20/2018	5:38:56 AM	41400	9.72
1/20/2018	5:43:56 AM	41700	9.716
1/20/2018	5:48:56 AM	42000	9.719
1/20/2018	5:53:56 AM	42300	9.718
1/20/2018	5:58:56 AM	42600	9.717

17PZ02 Ambient.txt

1/20/2018	6:03:56 AM	42900	9.715
1/20/2018	6:08:56 AM	43200	9.717
1/20/2018	6:13:56 AM	43500	9.713
1/20/2018	6:18:56 AM	43800	9.716
1/20/2018	6:23:56 AM	44100	9.71
1/20/2018	6:28:56 AM	44400	9.716
1/20/2018	6:33:56 AM	44700	9.713
1/20/2018	6:38:56 AM	45000	9.713
1/20/2018	6:43:56 AM	45300	9.71
1/20/2018	6:48:56 AM	45600	9.715
1/20/2018	6:53:56 AM	45900	9.715
1/20/2018	6:58:56 AM	46200	9.712
1/20/2018	7:03:56 AM	46500	9.712
1/20/2018	7:08:56 AM	46800	9.712
1/20/2018	7:13:56 AM	47100	9.71
1/20/2018	7:18:56 AM	47400	9.716
1/20/2018	7:23:56 AM	47700	9.712
1/20/2018	7:28:56 AM	48000	9.713
1/20/2018	7:33:56 AM	48300	9.711
1/20/2018	7:38:56 AM	48600	9.71
1/20/2018	7:43:56 AM	48900	9.709
1/20/2018	7:48:56 AM	49200	9.713
1/20/2018	7:53:56 AM	49500	9.709
1/20/2018	7:58:56 AM	49800	9.711
1/20/2018	8:03:56 AM	50100	9.702
1/20/2018	8:08:56 AM	50400	9.706
1/20/2018	8:13:56 AM	50700	9.71
1/20/2018	8:18:56 AM	51000	9.709
1/20/2018	8:23:56 AM	51300	9.71
1/20/2018	8:28:56 AM	51600	9.705
1/20/2018	8:33:56 AM	51900	9.703
1/20/2018	8:38:56 AM	52200	9.704
1/20/2018	8:43:56 AM	52500	9.703
1/20/2018	8:48:56 AM	52800	9.706
1/20/2018	8:53:56 AM	53100	9.706
1/20/2018	8:58:56 AM	53400	9.706
1/20/2018	9:03:56 AM	53700	9.701
1/20/2018	9:08:56 AM	54000	9.703
1/20/2018	9:13:56 AM	54300	9.706
1/20/2018	9:18:56 AM	54600	9.701
1/20/2018	9:23:56 AM	54900	9.699
1/20/2018	9:28:56 AM	55200	9.701
1/20/2018	9:33:56 AM	55500	9.703
1/20/2018	9:38:56 AM	55800	9.702
1/20/2018	9:43:56 AM	56100	9.699
1/20/2018	9:48:56 AM	56400	9.703
1/20/2018	9:53:56 AM	56700	9.702
1/20/2018	9:58:56 AM	57000	9.698

17PZ02 Ambient.txt

1/20/2018	10:03:56 AM	57300	9.7
1/20/2018	10:08:56 AM	57600	9.699
1/20/2018	10:13:56 AM	57900	9.7
1/20/2018	10:18:56 AM	58200	9.698
1/20/2018	10:23:56 AM	58500	9.698
1/20/2018	10:28:56 AM	58800	9.697
1/20/2018	10:33:56 AM	59100	9.698
1/20/2018	10:38:56 AM	59400	9.689
1/20/2018	10:43:56 AM	59700	9.701
1/20/2018	10:48:56 AM	60000	9.703
1/20/2018	10:53:56 AM	60300	9.701
1/20/2018	10:58:56 AM	60600	9.702
1/20/2018	11:03:56 AM	60900	9.698
1/20/2018	11:08:56 AM	61200	9.703
1/20/2018	11:13:56 AM	61500	9.701
1/20/2018	11:18:56 AM	61800	9.708
1/20/2018	11:23:56 AM	62100	9.701
1/20/2018	11:28:56 AM	62400	9.699
1/20/2018	11:33:56 AM	62700	9.694
1/20/2018	11:38:56 AM	63000	9.702
1/20/2018	11:43:56 AM	63300	9.706
1/20/2018	11:48:56 AM	63600	9.706
1/20/2018	11:53:56 AM	63900	9.711
1/20/2018	11:58:56 AM	64200	9.709
1/20/2018	12:03:56 PM	64500	9.716
1/20/2018	12:08:56 PM	64800	9.712
1/20/2018	12:13:56 PM	65100	9.715
1/20/2018	12:18:56 PM	65400	9.717
1/20/2018	12:23:56 PM	65700	9.715
1/20/2018	12:28:56 PM	66000	9.723
1/20/2018	12:33:56 PM	66300	9.716
1/20/2018	12:38:56 PM	66600	9.723
1/20/2018	12:43:56 PM	66900	9.724
1/20/2018	12:48:56 PM	67200	9.725
1/20/2018	12:53:56 PM	67500	9.725
1/20/2018	12:58:56 PM	67800	9.725
1/20/2018	1:03:56 PM	68100	9.725
1/20/2018	1:08:56 PM	68400	9.723
1/20/2018	1:13:56 PM	68700	9.726
1/20/2018	1:18:56 PM	69000	9.727
1/20/2018	1:23:56 PM	69300	9.729
1/20/2018	1:28:56 PM	69600	9.731
1/20/2018	1:33:56 PM	69900	9.731
1/20/2018	1:38:56 PM	70200	9.731
1/20/2018	1:43:56 PM	70500	9.734
1/20/2018	1:48:56 PM	70800	9.732
1/20/2018	1:53:56 PM	71100	9.735
1/20/2018	1:58:56 PM	71400	9.727

17PZ02 Ambient.txt

1/20/2018	2:03:56 PM	71700	9.732
1/20/2018	2:08:56 PM	72000	9.739
1/20/2018	2:13:56 PM	72300	9.736
1/20/2018	2:18:56 PM	72600	9.734
1/20/2018	2:23:56 PM	72900	9.738
1/20/2018	2:28:56 PM	73200	9.738
1/20/2018	2:33:56 PM	73500	9.736
1/20/2018	2:38:56 PM	73800	9.737
1/20/2018	2:43:56 PM	74100	9.736
1/20/2018	2:48:56 PM	74400	9.735
1/20/2018	2:53:56 PM	74700	9.735
1/20/2018	2:58:56 PM	75000	9.737
1/20/2018	3:03:56 PM	75300	9.736
1/20/2018	3:08:56 PM	75600	9.734
1/20/2018	3:13:56 PM	75900	9.733
1/20/2018	3:18:56 PM	76200	9.741
1/20/2018	3:23:56 PM	76500	9.74
1/20/2018	3:28:56 PM	76800	9.737
1/20/2018	3:33:56 PM	77100	9.738
1/20/2018	3:38:56 PM	77400	9.741
1/20/2018	3:43:56 PM	77700	9.734
1/20/2018	3:48:56 PM	78000	9.739
1/20/2018	3:53:56 PM	78300	9.736
1/20/2018	3:58:56 PM	78600	9.733
1/20/2018	4:03:56 PM	78900	9.735
1/20/2018	4:08:56 PM	79200	9.738
1/20/2018	4:13:56 PM	79500	9.736
1/20/2018	4:18:56 PM	79800	9.724
1/20/2018	4:23:56 PM	80100	9.737
1/20/2018	4:28:56 PM	80400	9.745
1/20/2018	4:33:56 PM	80700	9.737
1/20/2018	4:38:56 PM	81000	9.733
1/20/2018	4:43:56 PM	81300	9.738
1/20/2018	4:48:56 PM	81600	9.735
1/20/2018	4:53:56 PM	81900	9.733
1/20/2018	4:58:56 PM	82200	9.734
1/20/2018	5:03:56 PM	82500	9.738
1/20/2018	5:08:56 PM	82800	9.735
1/20/2018	5:13:56 PM	83100	9.741
1/20/2018	5:18:56 PM	83400	9.739
1/20/2018	5:23:56 PM	83700	9.729
1/20/2018	5:28:56 PM	84000	9.729
1/20/2018	5:33:56 PM	84300	9.731
1/20/2018	5:38:56 PM	84600	9.732
1/20/2018	5:43:56 PM	84900	9.731
1/20/2018	5:48:56 PM	85200	9.727
1/20/2018	5:53:56 PM	85500	9.729
1/20/2018	5:58:56 PM	85800	9.733

17PZ02 Ambient.txt

1/20/2018	6:03:56 PM	86100	9.725
1/20/2018	6:08:56 PM	86400	9.732
1/20/2018	6:13:56 PM	86700	9.728
1/20/2018	6:18:56 PM	87000	9.721
1/20/2018	6:23:56 PM	87300	9.724
1/20/2018	6:28:56 PM	87600	9.726
1/20/2018	6:33:56 PM	87900	9.724
1/20/2018	6:38:56 PM	88200	9.72
1/20/2018	6:43:56 PM	88500	9.724
1/20/2018	6:48:56 PM	88800	9.719
1/20/2018	6:53:56 PM	89100	9.721
1/20/2018	6:58:56 PM	89400	9.72
1/20/2018	7:03:56 PM	89700	9.717
1/20/2018	7:08:56 PM	90000	9.722
1/20/2018	7:13:56 PM	90300	9.722
1/20/2018	7:18:56 PM	90600	9.72
1/20/2018	7:23:56 PM	90900	9.719
1/20/2018	7:28:56 PM	91200	9.721
1/20/2018	7:33:56 PM	91500	9.718
1/20/2018	7:38:56 PM	91800	9.714
1/20/2018	7:43:56 PM	92100	9.719
1/20/2018	7:48:56 PM	92400	9.72
1/20/2018	7:53:56 PM	92700	9.719
1/20/2018	7:58:56 PM	93000	9.72
1/20/2018	8:03:56 PM	93300	9.72
1/20/2018	8:08:56 PM	93600	9.72
1/20/2018	8:13:56 PM	93900	9.71
1/20/2018	8:18:56 PM	94200	9.717
1/20/2018	8:23:56 PM	94500	9.715
1/20/2018	8:28:56 PM	94800	9.716
1/20/2018	8:33:56 PM	95100	9.712
1/20/2018	8:38:56 PM	95400	9.718
1/20/2018	8:43:56 PM	95700	9.715
1/20/2018	8:48:56 PM	96000	9.714
1/20/2018	8:53:56 PM	96300	9.716
1/20/2018	8:58:56 PM	96600	9.713
1/20/2018	9:03:56 PM	96900	9.719
1/20/2018	9:08:56 PM	97200	9.718
1/20/2018	9:13:56 PM	97500	9.72
1/20/2018	9:18:56 PM	97800	9.719
1/20/2018	9:23:56 PM	98100	9.718
1/20/2018	9:28:56 PM	98400	9.718
1/20/2018	9:33:56 PM	98700	9.72
1/20/2018	9:38:56 PM	99000	9.72
1/20/2018	9:43:56 PM	99300	9.722
1/20/2018	9:48:56 PM	99600	9.721
1/20/2018	9:53:56 PM	99900	9.717
1/20/2018	9:58:56 PM	100200	9.724

17PZ02 Ambient.txt

1/20/2018	10:03:56 PM	100500	9.72
1/20/2018	10:08:56 PM	100800	9.72
1/20/2018	10:13:56 PM	101100	9.719
1/20/2018	10:18:56 PM	101400	9.722
1/20/2018	10:23:56 PM	101700	9.721
1/20/2018	10:28:56 PM	102000	9.717
1/20/2018	10:33:56 PM	102300	9.72
1/20/2018	10:38:56 PM	102600	9.719
1/20/2018	10:43:56 PM	102900	9.72
1/20/2018	10:48:56 PM	103200	9.722
1/20/2018	10:53:56 PM	103500	9.72
1/20/2018	10:58:56 PM	103800	9.718
1/20/2018	11:03:56 PM	104100	9.721
1/20/2018	11:08:56 PM	104400	9.717
1/20/2018	11:13:56 PM	104700	9.719
1/20/2018	11:18:56 PM	105000	9.722
1/20/2018	11:23:56 PM	105300	9.722
1/20/2018	11:28:56 PM	105600	9.721
1/20/2018	11:33:56 PM	105900	9.723
1/20/2018	11:38:56 PM	106200	9.725
1/20/2018	11:43:56 PM	106500	9.724
1/20/2018	11:48:56 PM	106800	9.719
1/20/2018	11:53:56 PM	107100	9.722
1/20/2018	11:58:56 PM	107400	9.722
1/21/2018	12:03:56 AM	107700	9.721
1/21/2018	12:08:56 AM	108000	9.72
1/21/2018	12:13:56 AM	108300	9.719
1/21/2018	12:18:56 AM	108600	9.716
1/21/2018	12:23:56 AM	108900	9.719
1/21/2018	12:28:56 AM	109200	9.722
1/21/2018	12:33:56 AM	109500	9.72
1/21/2018	12:38:56 AM	109800	9.721
1/21/2018	12:43:56 AM	110100	9.719
1/21/2018	12:48:56 AM	110400	9.716
1/21/2018	12:53:56 AM	110700	9.723
1/21/2018	12:58:56 AM	111000	9.718
1/21/2018	1:03:56 AM	111300	9.717
1/21/2018	1:08:56 AM	111600	9.717
1/21/2018	1:13:56 AM	111900	9.718
1/21/2018	1:18:56 AM	112200	9.718
1/21/2018	1:23:56 AM	112500	9.721
1/21/2018	1:28:56 AM	112800	9.719
1/21/2018	1:33:56 AM	113100	9.719
1/21/2018	1:38:56 AM	113400	9.719
1/21/2018	1:43:56 AM	113700	9.72
1/21/2018	1:48:56 AM	114000	9.716
1/21/2018	1:53:56 AM	114300	9.717
1/21/2018	1:58:56 AM	114600	9.722

17PZ02 Ambient.txt

1/21/2018	2:03:56 AM	114900	9.716
1/21/2018	2:08:56 AM	115200	9.72
1/21/2018	2:13:56 AM	115500	9.717
1/21/2018	2:18:56 AM	115800	9.721
1/21/2018	2:23:56 AM	116100	9.718
1/21/2018	2:28:56 AM	116400	9.72
1/21/2018	2:33:56 AM	116700	9.718
1/21/2018	2:38:56 AM	117000	9.721
1/21/2018	2:43:56 AM	117300	9.719
1/21/2018	2:48:56 AM	117600	9.723
1/21/2018	2:53:56 AM	117900	9.72
1/21/2018	2:58:56 AM	118200	9.727
1/21/2018	3:03:56 AM	118500	9.724
1/21/2018	3:08:56 AM	118800	9.727
1/21/2018	3:13:56 AM	119100	9.724
1/21/2018	3:18:56 AM	119400	9.726
1/21/2018	3:23:56 AM	119700	9.723
1/21/2018	3:28:56 AM	120000	9.724
1/21/2018	3:33:56 AM	120300	9.727
1/21/2018	3:38:56 AM	120600	9.727
1/21/2018	3:43:56 AM	120900	9.729
1/21/2018	3:48:56 AM	121200	9.727
1/21/2018	3:53:56 AM	121500	9.729
1/21/2018	3:58:56 AM	121800	9.727
1/21/2018	4:03:56 AM	122100	9.727
1/21/2018	4:08:56 AM	122400	9.728
1/21/2018	4:13:56 AM	122700	9.729
1/21/2018	4:18:56 AM	123000	9.73
1/21/2018	4:23:56 AM	123300	9.728
1/21/2018	4:28:56 AM	123600	9.726
1/21/2018	4:33:56 AM	123900	9.729
1/21/2018	4:38:56 AM	124200	9.73
1/21/2018	4:43:56 AM	124500	9.723
1/21/2018	4:48:56 AM	124800	9.721
1/21/2018	4:53:56 AM	125100	9.724
1/21/2018	4:58:56 AM	125400	9.721
1/21/2018	5:03:56 AM	125700	9.722
1/21/2018	5:08:56 AM	126000	9.727
1/21/2018	5:13:56 AM	126300	9.724
1/21/2018	5:18:56 AM	126600	9.722
1/21/2018	5:23:56 AM	126900	9.72
1/21/2018	5:28:56 AM	127200	9.725
1/21/2018	5:33:56 AM	127500	9.723
1/21/2018	5:38:56 AM	127800	9.721
1/21/2018	5:43:56 AM	128100	9.726
1/21/2018	5:48:56 AM	128400	9.723
1/21/2018	5:53:56 AM	128700	9.724
1/21/2018	5:58:56 AM	129000	9.723

17PZ02 Ambient.txt

1/21/2018	6:03:56 AM	129300	9.726
1/21/2018	6:08:56 AM	129600	9.726
1/21/2018	6:13:56 AM	129900	9.728
1/21/2018	6:18:56 AM	130200	9.725
1/21/2018	6:23:56 AM	130500	9.725
1/21/2018	6:28:56 AM	130800	9.723
1/21/2018	6:33:56 AM	131100	9.724
1/21/2018	6:38:56 AM	131400	9.725
1/21/2018	6:43:56 AM	131700	9.724
1/21/2018	6:48:56 AM	132000	9.724
1/21/2018	6:53:56 AM	132300	9.72
1/21/2018	6:58:56 AM	132600	9.723
1/21/2018	7:03:56 AM	132900	9.721
1/21/2018	7:08:56 AM	133200	9.718
1/21/2018	7:13:56 AM	133500	9.719
1/21/2018	7:18:56 AM	133800	9.719
1/21/2018	7:23:56 AM	134100	9.72
1/21/2018	7:28:56 AM	134400	9.72
1/21/2018	7:33:56 AM	134700	9.721
1/21/2018	7:38:56 AM	135000	9.722
1/21/2018	7:43:56 AM	135300	9.72
1/21/2018	7:48:56 AM	135600	9.721
1/21/2018	7:53:56 AM	135900	9.717
1/21/2018	7:58:56 AM	136200	9.716
1/21/2018	8:03:56 AM	136500	9.713
1/21/2018	8:08:56 AM	136800	9.72
1/21/2018	8:13:56 AM	137100	9.717
1/21/2018	8:18:56 AM	137400	9.72
1/21/2018	8:23:56 AM	137700	9.717
1/21/2018	8:28:56 AM	138000	9.717
1/21/2018	8:33:56 AM	138300	9.716
1/21/2018	8:38:56 AM	138600	9.714
1/21/2018	8:43:56 AM	138900	9.722
1/21/2018	8:48:56 AM	139200	9.712
1/21/2018	8:53:56 AM	139500	9.718
1/21/2018	8:58:56 AM	139800	9.718
1/21/2018	9:03:56 AM	140100	9.716
1/21/2018	9:08:56 AM	140400	9.717
1/21/2018	9:13:56 AM	140700	9.713
1/21/2018	9:18:56 AM	141000	9.709
1/21/2018	9:23:56 AM	141300	9.708
1/21/2018	9:28:56 AM	141600	9.709
1/21/2018	9:33:56 AM	141900	9.708
1/21/2018	9:38:56 AM	142200	9.702
1/21/2018	9:43:56 AM	142500	9.705
1/21/2018	9:48:56 AM	142800	9.704
1/21/2018	9:53:56 AM	143100	9.706
1/21/2018	9:58:56 AM	143400	9.702

17PZ02 Ambient.txt

1/21/2018	10:03:56 AM	143700	9.701
1/21/2018	10:08:56 AM	144000	9.7
1/21/2018	10:13:56 AM	144300	9.7
1/21/2018	10:18:56 AM	144600	9.702
1/21/2018	10:23:56 AM	144900	9.701
1/21/2018	10:28:56 AM	145200	9.7
1/21/2018	10:33:56 AM	145500	9.701
1/21/2018	10:38:56 AM	145800	9.703
1/21/2018	10:43:56 AM	146100	9.704
1/21/2018	10:48:56 AM	146400	9.708
1/21/2018	10:53:56 AM	146700	9.705
1/21/2018	10:58:56 AM	147000	9.711
1/21/2018	11:03:56 AM	147300	9.706
1/21/2018	11:08:56 AM	147600	9.704
1/21/2018	11:13:56 AM	147900	9.715
1/21/2018	11:18:56 AM	148200	9.713
1/21/2018	11:23:56 AM	148500	9.706
1/21/2018	11:28:56 AM	148800	9.714
1/21/2018	11:33:56 AM	149100	9.718
1/21/2018	11:38:56 AM	149400	9.718
1/21/2018	11:43:56 AM	149700	9.711
1/21/2018	11:48:56 AM	150000	9.721
1/21/2018	11:53:56 AM	150300	9.722
1/21/2018	11:58:56 AM	150600	9.72
1/21/2018	12:03:56 PM	150900	9.726
1/21/2018	12:08:56 PM	151200	9.727
1/21/2018	12:13:56 PM	151500	9.734
1/21/2018	12:18:56 PM	151800	9.732
1/21/2018	12:23:56 PM	152100	9.725
1/21/2018	12:28:56 PM	152400	9.735
1/21/2018	12:33:56 PM	152700	9.73
1/21/2018	12:38:56 PM	153000	9.731
1/21/2018	12:43:56 PM	153300	9.732
1/21/2018	12:48:56 PM	153600	9.732
1/21/2018	12:53:56 PM	153900	9.739
1/21/2018	12:58:56 PM	154200	9.737
1/21/2018	1:03:56 PM	154500	9.741
1/21/2018	1:08:56 PM	154800	9.737
1/21/2018	1:13:56 PM	155100	9.744
1/21/2018	1:18:56 PM	155400	9.739
1/21/2018	1:23:56 PM	155700	9.746
1/21/2018	1:28:56 PM	156000	9.753
1/21/2018	1:33:56 PM	156300	9.752
1/21/2018	1:38:56 PM	156600	9.75
1/21/2018	1:43:56 PM	156900	9.735
1/21/2018	1:48:56 PM	157200	9.745
1/21/2018	1:53:56 PM	157500	9.754
1/21/2018	1:58:56 PM	157800	9.755

17PZ02 Ambient.txt

1/21/2018	2:03:56 PM	158100	9.755
1/21/2018	2:08:56 PM	158400	9.75
1/21/2018	2:13:56 PM	158700	9.759
1/21/2018	2:18:56 PM	159000	9.76
1/21/2018	2:23:56 PM	159300	9.759
1/21/2018	2:28:56 PM	159600	9.757
1/21/2018	2:33:56 PM	159900	9.75
1/21/2018	2:38:56 PM	160200	9.766
1/21/2018	2:43:56 PM	160500	9.756
1/21/2018	2:48:56 PM	160800	9.762
1/21/2018	2:53:56 PM	161100	9.75
1/21/2018	2:58:56 PM	161400	9.758
1/21/2018	3:03:56 PM	161700	9.757
1/21/2018	3:08:56 PM	162000	9.761
1/21/2018	3:13:56 PM	162300	9.762
1/21/2018	3:18:56 PM	162600	9.753
1/21/2018	3:23:56 PM	162900	9.755
1/21/2018	3:28:56 PM	163200	9.766
1/21/2018	3:33:56 PM	163500	9.751
1/21/2018	3:38:56 PM	163800	9.768
1/21/2018	3:43:56 PM	164100	9.761
1/21/2018	3:48:56 PM	164400	9.764
1/21/2018	3:53:56 PM	164700	9.758
1/21/2018	3:58:56 PM	165000	9.768
1/21/2018	4:03:56 PM	165300	9.767
1/21/2018	4:08:56 PM	165600	9.771
1/21/2018	4:13:56 PM	165900	9.767
1/21/2018	4:18:56 PM	166200	9.762
1/21/2018	4:23:56 PM	166500	9.762
1/21/2018	4:28:56 PM	166800	9.764
1/21/2018	4:33:56 PM	167100	9.767
1/21/2018	4:38:56 PM	167400	9.766
1/21/2018	4:43:56 PM	167700	9.766
1/21/2018	4:48:56 PM	168000	9.764
1/21/2018	4:53:56 PM	168300	9.763
1/21/2018	4:58:56 PM	168600	9.764
1/21/2018	5:03:56 PM	168900	9.765
1/21/2018	5:08:56 PM	169200	9.763
1/21/2018	5:13:56 PM	169500	9.764
1/21/2018	5:18:56 PM	169800	9.761
1/21/2018	5:23:56 PM	170100	9.761
1/21/2018	5:28:56 PM	170400	9.76
1/21/2018	5:33:56 PM	170700	9.762
1/21/2018	5:38:56 PM	171000	9.763
1/21/2018	5:43:56 PM	171300	9.761
1/21/2018	5:48:56 PM	171600	9.76
1/21/2018	5:53:56 PM	171900	9.762
1/21/2018	5:58:56 PM	172200	9.763

17PZ02 Ambient.txt

1/21/2018	6:03:56 PM	172500	9.759
1/21/2018	6:08:56 PM	172800	9.757
1/21/2018	6:13:56 PM	173100	9.768
1/21/2018	6:18:56 PM	173400	9.763
1/21/2018	6:23:56 PM	173700	9.762
1/21/2018	6:28:56 PM	174000	9.764
1/21/2018	6:33:56 PM	174300	9.767
1/21/2018	6:38:56 PM	174600	9.768
1/21/2018	6:43:56 PM	174900	9.766
1/21/2018	6:48:56 PM	175200	9.768
1/21/2018	6:53:56 PM	175500	9.762
1/21/2018	6:58:56 PM	175800	9.763
1/21/2018	7:03:56 PM	176100	9.764
1/21/2018	7:08:56 PM	176400	9.769
1/21/2018	7:13:56 PM	176700	9.765
1/21/2018	7:18:56 PM	177000	9.766
1/21/2018	7:23:56 PM	177300	9.768
1/21/2018	7:28:56 PM	177600	9.759
1/21/2018	7:33:56 PM	177900	9.763
1/21/2018	7:38:56 PM	178200	9.768
1/21/2018	7:43:56 PM	178500	9.763
1/21/2018	7:48:56 PM	178800	9.762
1/21/2018	7:53:56 PM	179100	9.766
1/21/2018	7:58:56 PM	179400	9.769
1/21/2018	8:03:56 PM	179700	9.768
1/21/2018	8:08:56 PM	180000	9.769
1/21/2018	8:13:56 PM	180300	9.775
1/21/2018	8:18:56 PM	180600	9.771
1/21/2018	8:23:56 PM	180900	9.776
1/21/2018	8:28:56 PM	181200	9.775
1/21/2018	8:33:56 PM	181500	9.773
1/21/2018	8:38:56 PM	181800	9.771
1/21/2018	8:43:56 PM	182100	9.773
1/21/2018	8:48:56 PM	182400	9.767
1/21/2018	8:53:56 PM	182700	9.772
1/21/2018	8:58:56 PM	183000	9.774
1/21/2018	9:03:56 PM	183300	9.779
1/21/2018	9:08:56 PM	183600	9.78
1/21/2018	9:13:56 PM	183900	9.783
1/21/2018	9:18:56 PM	184200	9.779
1/21/2018	9:23:56 PM	184500	9.78
1/21/2018	9:28:56 PM	184800	9.787
1/21/2018	9:33:56 PM	185100	9.776
1/21/2018	9:38:56 PM	185400	9.78
1/21/2018	9:43:56 PM	185700	9.776
1/21/2018	9:48:56 PM	186000	9.775
1/21/2018	9:53:56 PM	186300	9.775
1/21/2018	9:58:56 PM	186600	9.77

17PZ02 Ambient.txt

1/21/2018	10:03:56 PM	186900	9.767
1/21/2018	10:08:56 PM	187200	9.767
1/21/2018	10:13:56 PM	187500	9.768
1/21/2018	10:18:56 PM	187800	9.771
1/21/2018	10:23:56 PM	188100	9.774
1/21/2018	10:28:56 PM	188400	9.773
1/21/2018	10:33:56 PM	188700	9.769
1/21/2018	10:38:56 PM	189000	9.772
1/21/2018	10:43:56 PM	189300	9.776
1/21/2018	10:48:56 PM	189600	9.77
1/21/2018	10:53:56 PM	189900	9.773
1/21/2018	10:58:56 PM	190200	9.772
1/21/2018	11:03:56 PM	190500	9.769
1/21/2018	11:08:56 PM	190800	9.777
1/21/2018	11:13:56 PM	191100	9.781
1/21/2018	11:18:56 PM	191400	9.776
1/21/2018	11:23:56 PM	191700	9.775
1/21/2018	11:28:56 PM	192000	9.782
1/21/2018	11:33:56 PM	192300	9.783
1/21/2018	11:38:56 PM	192600	9.782
1/21/2018	11:43:56 PM	192900	9.783
1/21/2018	11:48:56 PM	193200	9.782
1/21/2018	11:53:56 PM	193500	9.785
1/21/2018	11:58:56 PM	193800	9.785
1/22/2018	12:03:56 AM	194100	9.778
1/22/2018	12:08:56 AM	194400	9.78
1/22/2018	12:13:56 AM	194700	9.779
1/22/2018	12:18:56 AM	195000	9.779
1/22/2018	12:23:56 AM	195300	9.78
1/22/2018	12:28:56 AM	195600	9.772
1/22/2018	12:33:56 AM	195900	9.772
1/22/2018	12:38:56 AM	196200	9.768
1/22/2018	12:43:56 AM	196500	9.768
1/22/2018	12:48:56 AM	196800	9.772
1/22/2018	12:53:56 AM	197100	9.773
1/22/2018	12:58:56 AM	197400	9.779
1/22/2018	1:03:56 AM	197700	9.775
1/22/2018	1:08:56 AM	198000	9.774
1/22/2018	1:13:56 AM	198300	9.773
1/22/2018	1:18:56 AM	198600	9.772
1/22/2018	1:23:56 AM	198900	9.772
1/22/2018	1:28:56 AM	199200	9.775
1/22/2018	1:33:56 AM	199500	9.767
1/22/2018	1:38:56 AM	199800	9.761
1/22/2018	1:43:56 AM	200100	9.766
1/22/2018	1:48:56 AM	200400	9.767
1/22/2018	1:53:56 AM	200700	9.768
1/22/2018	1:58:56 AM	201000	9.76

17PZ02 Ambient.txt

1/22/2018	2:03:56 AM	201300	9.766
1/22/2018	2:08:56 AM	201600	9.765
1/22/2018	2:13:56 AM	201900	9.763
1/22/2018	2:18:56 AM	202200	9.765
1/22/2018	2:23:56 AM	202500	9.767
1/22/2018	2:28:56 AM	202800	9.765
1/22/2018	2:33:56 AM	203100	9.767
1/22/2018	2:38:56 AM	203400	9.771
1/22/2018	2:43:56 AM	203700	9.766
1/22/2018	2:48:56 AM	204000	9.763
1/22/2018	2:53:56 AM	204300	9.761
1/22/2018	2:58:56 AM	204600	9.757
1/22/2018	3:03:56 AM	204900	9.76
1/22/2018	3:08:56 AM	205200	9.763
1/22/2018	3:13:56 AM	205500	9.76
1/22/2018	3:18:56 AM	205800	9.769
1/22/2018	3:23:56 AM	206100	9.766
1/22/2018	3:28:56 AM	206400	9.763
1/22/2018	3:33:56 AM	206700	9.765
1/22/2018	3:38:56 AM	207000	9.762
1/22/2018	3:43:56 AM	207300	9.764
1/22/2018	3:48:56 AM	207600	9.76
1/22/2018	3:53:56 AM	207900	9.757
1/22/2018	3:58:56 AM	208200	9.762
1/22/2018	4:03:56 AM	208500	9.755
1/22/2018	4:08:56 AM	208800	9.752
1/22/2018	4:13:56 AM	209100	9.755
1/22/2018	4:18:56 AM	209400	9.757
1/22/2018	4:23:56 AM	209700	9.757
1/22/2018	4:28:56 AM	210000	9.76
1/22/2018	4:33:56 AM	210300	9.755
1/22/2018	4:38:56 AM	210600	9.756
1/22/2018	4:43:56 AM	210900	9.756
1/22/2018	4:48:56 AM	211200	9.754
1/22/2018	4:53:56 AM	211500	9.754
1/22/2018	4:58:56 AM	211800	9.755
1/22/2018	5:03:56 AM	212100	9.751
1/22/2018	5:08:56 AM	212400	9.748
1/22/2018	5:13:56 AM	212700	9.747
1/22/2018	5:18:56 AM	213000	9.746
1/22/2018	5:23:56 AM	213300	9.748
1/22/2018	5:28:56 AM	213600	9.745
1/22/2018	5:33:56 AM	213900	9.743
1/22/2018	5:38:56 AM	214200	9.744
1/22/2018	5:43:56 AM	214500	9.739
1/22/2018	5:48:56 AM	214800	9.742
1/22/2018	5:53:56 AM	215100	9.734
1/22/2018	5:58:56 AM	215400	9.732

17PZ02 Ambient.txt

1/22/2018	6:03:56 AM	215700	9.737
1/22/2018	6:08:56 AM	216000	9.73
1/22/2018	6:13:56 AM	216300	9.727
1/22/2018	6:18:56 AM	216600	9.735
1/22/2018	6:23:56 AM	216900	9.731
1/22/2018	6:28:56 AM	217200	9.733
1/22/2018	6:33:56 AM	217500	9.731
1/22/2018	6:38:56 AM	217800	9.73
1/22/2018	6:43:56 AM	218100	9.731
1/22/2018	6:48:56 AM	218400	9.733
1/22/2018	6:53:56 AM	218700	9.731
1/22/2018	6:58:56 AM	219000	9.728
1/22/2018	7:03:56 AM	219300	9.725
1/22/2018	7:08:56 AM	219600	9.726
1/22/2018	7:13:56 AM	219900	9.725
1/22/2018	7:18:56 AM	220200	9.725
1/22/2018	7:23:56 AM	220500	9.726
1/22/2018	7:28:56 AM	220800	9.723
1/22/2018	7:33:56 AM	221100	9.719
1/22/2018	7:38:56 AM	221400	9.72
1/22/2018	7:43:56 AM	221700	9.721
1/22/2018	7:48:56 AM	222000	9.717
1/22/2018	7:53:56 AM	222300	9.713
1/22/2018	7:58:56 AM	222600	9.716
1/22/2018	8:03:56 AM	222900	9.715
1/22/2018	8:08:56 AM	223200	9.714
1/22/2018	8:13:56 AM	223500	9.702
1/22/2018	8:18:56 AM	223800	9.707
1/22/2018	8:23:56 AM	224100	9.704
1/22/2018	8:28:56 AM	224400	9.702
1/22/2018	8:33:56 AM	224700	9.709
1/22/2018	8:38:56 AM	225000	9.701
1/22/2018	8:43:56 AM	225300	9.701
1/22/2018	8:48:56 AM	225600	9.704
1/22/2018	8:53:56 AM	225900	9.707
1/22/2018	8:58:56 AM	226200	9.688
1/22/2018	9:03:56 AM	226500	9.705
1/22/2018	9:08:56 AM	226800	9.699
1/22/2018	9:13:56 AM	227100	9.707
1/22/2018	9:18:56 AM	227400	9.697
1/22/2018	9:23:56 AM	227700	9.694
1/22/2018	9:28:56 AM	228000	9.691
1/22/2018	9:33:56 AM	228300	9.693
1/22/2018	9:38:56 AM	228600	9.69
1/22/2018	9:43:56 AM	228900	9.7
1/22/2018	9:48:56 AM	229200	9.694
1/22/2018	9:53:56 AM	229500	9.681
1/22/2018	9:58:56 AM	229800	9.688

		17PZ02 Ambient.txt	
1/22/2018	10:03:56 AM	230100	9.688
1/22/2018	10:08:56 AM	230400	9.685
1/22/2018	10:13:56 AM	230700.002	9.689
1/22/2018	10:18:56 AM	231000	9.691
1/22/2018	10:23:56 AM	231300	9.689
1/22/2018	10:28:56 AM	231600	9.699
1/22/2018	10:33:56 AM	231900	9.698
1/22/2018	10:38:56 AM	232200	9.69
1/22/2018	10:43:56 AM	232500	9.7

17PZ03 Ambient.txt

Date	Time	Seconds	Depth (ft)
1/19/2018	5:49:48 PM	0	9.794
1/19/2018	5:54:48 PM	300.001	9.794
1/19/2018	5:59:48 PM	600.001	9.791
1/19/2018	6:04:48 PM	900.001	9.8
1/19/2018	6:09:48 PM	1200.001	9.796
1/19/2018	6:14:48 PM	1500.001	9.794
1/19/2018	6:19:48 PM	1800.001	9.797
1/19/2018	6:24:48 PM	2100.001	9.79
1/19/2018	6:29:48 PM	2400.001	9.791
1/19/2018	6:34:48 PM	2700.001	9.787
1/19/2018	6:39:48 PM	3000.001	9.786
1/19/2018	6:44:48 PM	3300.001	9.778
1/19/2018	6:49:48 PM	3600.001	9.786
1/19/2018	6:54:48 PM	3900.001	9.782
1/19/2018	6:59:48 PM	4200.001	9.779
1/19/2018	7:04:48 PM	4500.001	9.78
1/19/2018	7:09:48 PM	4800.001	9.784
1/19/2018	7:14:48 PM	5100.001	9.785
1/19/2018	7:19:48 PM	5400.001	9.784
1/19/2018	7:24:48 PM	5700.001	9.782
1/19/2018	7:29:48 PM	6000.001	9.78
1/19/2018	7:34:48 PM	6300.001	9.782
1/19/2018	7:39:48 PM	6600.001	9.781
1/19/2018	7:44:48 PM	6900.001	9.781
1/19/2018	7:49:48 PM	7200.001	9.783
1/19/2018	7:54:48 PM	7500.001	9.778
1/19/2018	7:59:48 PM	7800.001	9.783
1/19/2018	8:04:48 PM	8100.001	9.78
1/19/2018	8:09:48 PM	8400.001	9.777
1/19/2018	8:14:48 PM	8700.001	9.785
1/19/2018	8:19:48 PM	9000.001	9.78
1/19/2018	8:24:48 PM	9300.001	9.785
1/19/2018	8:29:48 PM	9600.001	9.781
1/19/2018	8:34:48 PM	9900.001	9.784
1/19/2018	8:39:48 PM	10200.001	9.782
1/19/2018	8:44:48 PM	10500.001	9.778
1/19/2018	8:49:48 PM	10800.001	9.78
1/19/2018	8:54:48 PM	11100.001	9.779
1/19/2018	8:59:48 PM	11400.001	9.78
1/19/2018	9:04:48 PM	11700.001	9.782
1/19/2018	9:09:48 PM	12000.001	9.78
1/19/2018	9:14:48 PM	12300.001	9.785
1/19/2018	9:19:48 PM	12600.001	9.781
1/19/2018	9:24:48 PM	12900.001	9.784
1/19/2018	9:29:48 PM	13200.001	9.78
1/19/2018	9:34:48 PM	13500.001	9.779
1/19/2018	9:39:48 PM	13800.001	9.781

17PZ03 Ambient.txt

1/19/2018	9:44:48 PM	14100.001	9.781
1/19/2018	9:49:48 PM	14400.001	9.782
1/19/2018	9:54:48 PM	14700.001	9.78
1/19/2018	9:59:48 PM	15000.001	9.777
1/19/2018	10:04:48 PM	15300.001	9.776
1/19/2018	10:09:48 PM	15600.001	9.778
1/19/2018	10:14:48 PM	15900.001	9.781
1/19/2018	10:19:48 PM	16200.001	9.776
1/19/2018	10:24:48 PM	16500.001	9.782
1/19/2018	10:29:48 PM	16800.001	9.774
1/19/2018	10:34:48 PM	17100.001	9.778
1/19/2018	10:39:48 PM	17400.001	9.774
1/19/2018	10:44:48 PM	17700.001	9.779
1/19/2018	10:49:48 PM	18000.001	9.78
1/19/2018	10:54:48 PM	18300.001	9.779
1/19/2018	10:59:48 PM	18600.001	9.781
1/19/2018	11:04:48 PM	18900.001	9.779
1/19/2018	11:09:48 PM	19200.001	9.783
1/19/2018	11:14:48 PM	19500.001	9.782
1/19/2018	11:19:48 PM	19800.001	9.778
1/19/2018	11:24:48 PM	20100.001	9.78
1/19/2018	11:29:48 PM	20400.001	9.781
1/19/2018	11:34:48 PM	20700.001	9.779
1/19/2018	11:39:48 PM	21000.001	9.778
1/19/2018	11:44:48 PM	21300.001	9.775
1/19/2018	11:49:48 PM	21600.001	9.779
1/19/2018	11:54:48 PM	21900.001	9.784
1/19/2018	11:59:48 PM	22200.001	9.783
1/20/2018	12:04:48 AM	22500.001	9.786
1/20/2018	12:09:48 AM	22800.001	9.781
1/20/2018	12:14:48 AM	23100.001	9.78
1/20/2018	12:19:48 AM	23400.001	9.785
1/20/2018	12:24:48 AM	23700.001	9.784
1/20/2018	12:29:48 AM	24000.001	9.782
1/20/2018	12:34:48 AM	24300.001	9.784
1/20/2018	12:39:48 AM	24600.001	9.785
1/20/2018	12:44:48 AM	24900.001	9.782
1/20/2018	12:49:48 AM	25200.001	9.782
1/20/2018	12:54:48 AM	25500.001	9.783
1/20/2018	12:59:48 AM	25800.001	9.785
1/20/2018	1:04:48 AM	26100.001	9.783
1/20/2018	1:09:48 AM	26400.001	9.783
1/20/2018	1:14:48 AM	26700.001	9.784
1/20/2018	1:19:48 AM	27000.001	9.788
1/20/2018	1:24:48 AM	27300.001	9.786
1/20/2018	1:29:48 AM	27600.001	9.786
1/20/2018	1:34:48 AM	27900.001	9.785
1/20/2018	1:39:48 AM	28200.001	9.791

17PZ03 Ambient.txt

1/20/2018	1:44:48 AM	28500.001	9.788
1/20/2018	1:49:48 AM	28800.001	9.792
1/20/2018	1:54:48 AM	29100.001	9.786
1/20/2018	1:59:48 AM	29400.001	9.791
1/20/2018	2:04:48 AM	29700.001	9.785
1/20/2018	2:09:48 AM	30000.001	9.788
1/20/2018	2:14:48 AM	30300.001	9.789
1/20/2018	2:19:48 AM	30600.001	9.788
1/20/2018	2:24:48 AM	30900.001	9.79
1/20/2018	2:29:48 AM	31200.001	9.791
1/20/2018	2:34:48 AM	31500.001	9.791
1/20/2018	2:39:48 AM	31800.001	9.789
1/20/2018	2:44:48 AM	32100.001	9.789
1/20/2018	2:49:48 AM	32400.001	9.794
1/20/2018	2:54:48 AM	32700.001	9.793
1/20/2018	2:59:48 AM	33000.001	9.797
1/20/2018	3:04:48 AM	33300.001	9.789
1/20/2018	3:09:48 AM	33600.001	9.788
1/20/2018	3:14:48 AM	33900.001	9.792
1/20/2018	3:19:48 AM	34200.001	9.792
1/20/2018	3:24:48 AM	34500.001	9.79
1/20/2018	3:29:48 AM	34800.001	9.794
1/20/2018	3:34:48 AM	35100.001	9.793
1/20/2018	3:39:48 AM	35400.001	9.789
1/20/2018	3:44:48 AM	35700.001	9.79
1/20/2018	3:49:48 AM	36000.001	9.785
1/20/2018	3:54:48 AM	36300.001	9.79
1/20/2018	3:59:48 AM	36600.001	9.795
1/20/2018	4:04:48 AM	36900.001	9.791
1/20/2018	4:09:48 AM	37200.001	9.792
1/20/2018	4:14:48 AM	37500.001	9.792
1/20/2018	4:19:48 AM	37800.001	9.791
1/20/2018	4:24:48 AM	38100.001	9.794
1/20/2018	4:29:48 AM	38400.001	9.794
1/20/2018	4:34:48 AM	38700.001	9.796
1/20/2018	4:39:48 AM	39000.001	9.795
1/20/2018	4:44:48 AM	39300.001	9.8
1/20/2018	4:49:48 AM	39600.001	9.793
1/20/2018	4:54:48 AM	39900.001	9.792
1/20/2018	4:59:48 AM	40200.001	9.789
1/20/2018	5:04:48 AM	40500.001	9.789
1/20/2018	5:09:48 AM	40800.001	9.791
1/20/2018	5:14:48 AM	41100.001	9.79
1/20/2018	5:19:48 AM	41400.001	9.789
1/20/2018	5:24:48 AM	41700.001	9.792
1/20/2018	5:29:48 AM	42000.001	9.793
1/20/2018	5:34:48 AM	42300.001	9.794
1/20/2018	5:39:48 AM	42600.001	9.796

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1/20/2018	5:44:48 AM	42900.001	9.79
1/20/2018	5:49:48 AM	43200.001	9.789
1/20/2018	5:54:48 AM	43500.001	9.791
1/20/2018	5:59:48 AM	43800.001	9.792
1/20/2018	6:04:48 AM	44100.001	9.791
1/20/2018	6:09:48 AM	44400.001	9.786
1/20/2018	6:14:48 AM	44700.001	9.787
1/20/2018	6:19:48 AM	45000.001	9.789
1/20/2018	6:24:48 AM	45300.001	9.786
1/20/2018	6:29:48 AM	45600.001	9.787
1/20/2018	6:34:48 AM	45900.001	9.783
1/20/2018	6:39:48 AM	46200.001	9.786
1/20/2018	6:44:48 AM	46500.001	9.782
1/20/2018	6:49:48 AM	46800.001	9.79
1/20/2018	6:54:48 AM	47100.001	9.791
1/20/2018	6:59:48 AM	47400.001	9.791
1/20/2018	7:04:48 AM	47700.001	9.788
1/20/2018	7:09:48 AM	48000.001	9.789
1/20/2018	7:14:48 AM	48300.001	9.785
1/20/2018	7:19:48 AM	48600.001	9.788
1/20/2018	7:24:48 AM	48900.001	9.785
1/20/2018	7:29:48 AM	49200.001	9.785
1/20/2018	7:34:48 AM	49500.001	9.785
1/20/2018	7:39:48 AM	49800.001	9.785
1/20/2018	7:44:48 AM	50100.001	9.791
1/20/2018	7:49:48 AM	50400.001	9.786
1/20/2018	7:54:48 AM	50700.001	9.789
1/20/2018	7:59:48 AM	51000.001	9.787
1/20/2018	8:04:48 AM	51300.001	9.784
1/20/2018	8:09:48 AM	51600.001	9.787
1/20/2018	8:14:48 AM	51900.001	9.785
1/20/2018	8:19:48 AM	52200.001	9.78
1/20/2018	8:24:48 AM	52500.001	9.784
1/20/2018	8:29:48 AM	52800.001	9.783
1/20/2018	8:34:48 AM	53100.001	9.783
1/20/2018	8:39:48 AM	53400.001	9.785
1/20/2018	8:44:48 AM	53700.001	9.779
1/20/2018	8:49:48 AM	54000.001	9.785
1/20/2018	8:54:48 AM	54300.001	9.78
1/20/2018	8:59:48 AM	54600.001	9.784
1/20/2018	9:04:48 AM	54900.001	9.78
1/20/2018	9:09:48 AM	55200.001	9.785
1/20/2018	9:14:48 AM	55500.001	9.78
1/20/2018	9:19:48 AM	55800.001	9.782
1/20/2018	9:24:48 AM	56100.001	9.78
1/20/2018	9:29:48 AM	56400.001	9.779
1/20/2018	9:34:48 AM	56700.001	9.781
1/20/2018	9:39:48 AM	57000.001	9.777

17PZ03 Ambient.txt

1/20/2018	9:44:48 AM	57300.001	9.778
1/20/2018	9:49:48 AM	57600.001	9.776
1/20/2018	9:54:48 AM	57900.001	9.774
1/20/2018	9:59:48 AM	58200.001	9.779
1/20/2018	10:04:48 AM	58500.001	9.778
1/20/2018	10:09:48 AM	58800.001	9.776
1/20/2018	10:14:48 AM	59100.001	9.78
1/20/2018	10:19:48 AM	59400.001	9.778
1/20/2018	10:24:48 AM	59700.001	9.777
1/20/2018	10:29:48 AM	60000.001	9.778
1/20/2018	10:34:48 AM	60300.001	9.776
1/20/2018	10:39:48 AM	60600.001	9.779
1/20/2018	10:44:48 AM	60900.001	9.776
1/20/2018	10:49:48 AM	61200.001	9.779
1/20/2018	10:54:48 AM	61500.001	9.778
1/20/2018	10:59:48 AM	61800.001	9.777
1/20/2018	11:04:48 AM	62100.001	9.774
1/20/2018	11:09:48 AM	62400.001	9.779
1/20/2018	11:14:48 AM	62700.001	9.779
1/20/2018	11:19:48 AM	63000.001	9.784
1/20/2018	11:24:48 AM	63300.001	9.781
1/20/2018	11:29:48 AM	63600.001	9.786
1/20/2018	11:34:48 AM	63900.001	9.779
1/20/2018	11:39:48 AM	64200.001	9.787
1/20/2018	11:44:48 AM	64500.001	9.785
1/20/2018	11:49:48 AM	64800.001	9.788
1/20/2018	11:54:48 AM	65100.001	9.789
1/20/2018	11:59:48 AM	65400.001	9.791
1/20/2018	12:04:48 PM	65700.001	9.791
1/20/2018	12:09:48 PM	66000.001	9.793
1/20/2018	12:14:48 PM	66300.001	9.796
1/20/2018	12:19:48 PM	66600.001	9.797
1/20/2018	12:24:48 PM	66900.001	9.796
1/20/2018	12:29:48 PM	67200.001	9.797
1/20/2018	12:34:48 PM	67500.001	9.794
1/20/2018	12:39:48 PM	67800.001	9.796
1/20/2018	12:44:48 PM	68100.001	9.798
1/20/2018	12:49:48 PM	68400.001	9.797
1/20/2018	12:54:48 PM	68700.001	9.804
1/20/2018	12:59:48 PM	69000.001	9.802
1/20/2018	1:04:48 PM	69300.001	9.803
1/20/2018	1:09:48 PM	69600.001	9.8
1/20/2018	1:14:48 PM	69900.001	9.805
1/20/2018	1:19:48 PM	70200.001	9.798
1/20/2018	1:24:48 PM	70500.001	9.804
1/20/2018	1:29:48 PM	70800.001	9.805
1/20/2018	1:34:48 PM	71100.001	9.802
1/20/2018	1:39:48 PM	71400.001	9.808

17PZ03 Ambient.txt

1/20/2018	1:44:48 PM	71700.001	9.808
1/20/2018	1:49:48 PM	72000.001	9.806
1/20/2018	1:54:48 PM	72300.001	9.807
1/20/2018	1:59:48 PM	72600.001	9.805
1/20/2018	2:04:48 PM	72900.001	9.802
1/20/2018	2:09:48 PM	73200.001	9.808
1/20/2018	2:14:48 PM	73500.001	9.808
1/20/2018	2:19:48 PM	73800.001	9.813
1/20/2018	2:24:48 PM	74100.001	9.809
1/20/2018	2:29:48 PM	74400.001	9.808
1/20/2018	2:34:48 PM	74700.001	9.806
1/20/2018	2:39:48 PM	75000.001	9.809
1/20/2018	2:44:48 PM	75300.001	9.808
1/20/2018	2:49:48 PM	75600.001	9.807
1/20/2018	2:54:48 PM	75900.001	9.806
1/20/2018	2:59:48 PM	76200.001	9.803
1/20/2018	3:04:48 PM	76500.001	9.811
1/20/2018	3:09:48 PM	76800.001	9.803
1/20/2018	3:14:48 PM	77100.001	9.81
1/20/2018	3:19:48 PM	77400.001	9.808
1/20/2018	3:24:48 PM	77700.001	9.808
1/20/2018	3:29:48 PM	78000.001	9.806
1/20/2018	3:34:48 PM	78300.001	9.807
1/20/2018	3:39:48 PM	78600.001	9.806
1/20/2018	3:44:48 PM	78900.001	9.805
1/20/2018	3:49:48 PM	79200.001	9.807
1/20/2018	3:54:48 PM	79500.001	9.804
1/20/2018	3:59:48 PM	79800.001	9.808
1/20/2018	4:04:48 PM	80100.001	9.809
1/20/2018	4:09:48 PM	80400.001	9.807
1/20/2018	4:14:48 PM	80700.001	9.805
1/20/2018	4:19:48 PM	81000.001	9.804
1/20/2018	4:24:48 PM	81300.001	9.811
1/20/2018	4:29:48 PM	81600.001	9.81
1/20/2018	4:34:48 PM	81900.001	9.804
1/20/2018	4:39:48 PM	82200.001	9.813
1/20/2018	4:44:48 PM	82500.001	9.808
1/20/2018	4:49:48 PM	82800.001	9.804
1/20/2018	4:54:48 PM	83100.001	9.807
1/20/2018	4:59:48 PM	83400.001	9.801
1/20/2018	5:04:48 PM	83700.001	9.806
1/20/2018	5:09:48 PM	84000.001	9.808
1/20/2018	5:14:48 PM	84300.001	9.804
1/20/2018	5:19:48 PM	84600.001	9.81
1/20/2018	5:24:48 PM	84900.001	9.801
1/20/2018	5:29:48 PM	85200.001	9.801
1/20/2018	5:34:48 PM	85500.001	9.796
1/20/2018	5:39:48 PM	85800.001	9.809

17PZ03 Ambient.txt

1/20/2018	5:44:48 PM	86100.001	9.799
1/20/2018	5:49:48 PM	86400.001	9.799
1/20/2018	5:54:48 PM	86700.001	9.801
1/20/2018	5:59:48 PM	87000.001	9.799
1/20/2018	6:04:48 PM	87300.001	9.8
1/20/2018	6:09:48 PM	87600.001	9.803
1/20/2018	6:14:48 PM	87900.001	9.8
1/20/2018	6:19:48 PM	88200.001	9.8
1/20/2018	6:24:48 PM	88500.001	9.797
1/20/2018	6:29:48 PM	88800.001	9.797
1/20/2018	6:34:48 PM	89100.001	9.796
1/20/2018	6:39:48 PM	89400.001	9.799
1/20/2018	6:44:48 PM	89700.001	9.801
1/20/2018	6:49:48 PM	90000.001	9.8
1/20/2018	6:54:48 PM	90300.001	9.797
1/20/2018	6:59:48 PM	90600.001	9.799
1/20/2018	7:04:48 PM	90900.001	9.795
1/20/2018	7:09:48 PM	91200.001	9.792
1/20/2018	7:14:48 PM	91500.001	9.799
1/20/2018	7:19:48 PM	91800.001	9.799
1/20/2018	7:24:48 PM	92100.001	9.797
1/20/2018	7:29:48 PM	92400.001	9.799
1/20/2018	7:34:48 PM	92700.001	9.797
1/20/2018	7:39:48 PM	93000.001	9.795
1/20/2018	7:44:48 PM	93300.001	9.796
1/20/2018	7:49:48 PM	93600.001	9.8
1/20/2018	7:54:48 PM	93900.001	9.796
1/20/2018	7:59:48 PM	94200.001	9.796
1/20/2018	8:04:48 PM	94500.001	9.799
1/20/2018	8:09:48 PM	94800.001	9.795
1/20/2018	8:14:48 PM	95100.001	9.794
1/20/2018	8:19:48 PM	95400.001	9.787
1/20/2018	8:24:48 PM	95700.001	9.793
1/20/2018	8:29:48 PM	96000.001	9.8
1/20/2018	8:34:48 PM	96300.001	9.794
1/20/2018	8:39:48 PM	96600.001	9.798
1/20/2018	8:44:48 PM	96900.001	9.796
1/20/2018	8:49:48 PM	97200.001	9.79
1/20/2018	8:54:48 PM	97500.001	9.795
1/20/2018	8:59:48 PM	97800.001	9.795
1/20/2018	9:04:48 PM	98100.001	9.796
1/20/2018	9:09:48 PM	98400.001	9.799
1/20/2018	9:14:48 PM	98700.001	9.798
1/20/2018	9:19:48 PM	99000.001	9.801
1/20/2018	9:24:48 PM	99300.001	9.799
1/20/2018	9:29:48 PM	99600.001	9.797
1/20/2018	9:34:48 PM	99900.001	9.799
1/20/2018	9:39:48 PM	100200.001	9.803

17PZ03 Ambient.txt

1/20/2018	9:44:48 PM	100500.001	9.796
1/20/2018	9:49:48 PM	100800.001	9.799
1/20/2018	9:54:48 PM	101100.001	9.798
1/20/2018	9:59:48 PM	101400.001	9.799
1/20/2018	10:04:48 PM	101700.001	9.802
1/20/2018	10:09:48 PM	102000.001	9.798
1/20/2018	10:14:48 PM	102300.001	9.797
1/20/2018	10:19:48 PM	102600.001	9.8
1/20/2018	10:24:48 PM	102900.001	9.797
1/20/2018	10:29:48 PM	103200.001	9.802
1/20/2018	10:34:48 PM	103500.001	9.8
1/20/2018	10:39:48 PM	103800.001	9.797
1/20/2018	10:44:48 PM	104100.001	9.794
1/20/2018	10:49:48 PM	104400.001	9.799
1/20/2018	10:54:48 PM	104700.001	9.792
1/20/2018	10:59:48 PM	105000.001	9.798
1/20/2018	11:04:48 PM	105300.001	9.797
1/20/2018	11:09:48 PM	105600.001	9.797
1/20/2018	11:14:48 PM	105900.001	9.798
1/20/2018	11:19:48 PM	106200.001	9.802
1/20/2018	11:24:48 PM	106500.001	9.798
1/20/2018	11:29:48 PM	106800.001	9.795
1/20/2018	11:34:48 PM	107100.001	9.799
1/20/2018	11:39:48 PM	107400.001	9.796
1/20/2018	11:44:48 PM	107700.001	9.797
1/20/2018	11:49:48 PM	108000.001	9.796
1/20/2018	11:54:48 PM	108300.001	9.797
1/20/2018	11:59:48 PM	108600.001	9.802
1/21/2018	12:04:48 AM	108900.001	9.803
1/21/2018	12:09:48 AM	109200.001	9.799
1/21/2018	12:14:48 AM	109500.001	9.797
1/21/2018	12:19:48 AM	109800.001	9.798
1/21/2018	12:24:48 AM	110100.001	9.797
1/21/2018	12:29:48 AM	110400.001	9.8
1/21/2018	12:34:48 AM	110700.001	9.797
1/21/2018	12:39:48 AM	111000.001	9.797
1/21/2018	12:44:48 AM	111300.001	9.798
1/21/2018	12:49:48 AM	111600.001	9.804
1/21/2018	12:54:48 AM	111900.001	9.795
1/21/2018	12:59:48 AM	112200.001	9.798
1/21/2018	1:04:48 AM	112500.001	9.801
1/21/2018	1:09:48 AM	112800.001	9.795
1/21/2018	1:14:48 AM	113100.001	9.799
1/21/2018	1:19:48 AM	113400.001	9.801
1/21/2018	1:24:48 AM	113700.001	9.8
1/21/2018	1:29:48 AM	114000.001	9.801
1/21/2018	1:34:48 AM	114300.001	9.799
1/21/2018	1:39:48 AM	114600.001	9.801

17PZ03 Ambient.txt

1/21/2018	1:44:48 AM	114900.001	9.796
1/21/2018	1:49:48 AM	115200.001	9.8
1/21/2018	1:54:48 AM	115500.001	9.801
1/21/2018	1:59:48 AM	115800.001	9.798
1/21/2018	2:04:48 AM	116100.001	9.801
1/21/2018	2:09:48 AM	116400.001	9.795
1/21/2018	2:14:48 AM	116700.001	9.796
1/21/2018	2:19:48 AM	117000.001	9.799
1/21/2018	2:24:48 AM	117300.001	9.798
1/21/2018	2:29:48 AM	117600.001	9.798
1/21/2018	2:34:48 AM	117900.001	9.799
1/21/2018	2:39:48 AM	118200.001	9.797
1/21/2018	2:44:48 AM	118500.001	9.798
1/21/2018	2:49:48 AM	118800.001	9.803
1/21/2018	2:54:48 AM	119100.001	9.8
1/21/2018	2:59:48 AM	119400.001	9.803
1/21/2018	3:04:48 AM	119700.001	9.805
1/21/2018	3:09:48 AM	120000.001	9.806
1/21/2018	3:14:48 AM	120300.001	9.801
1/21/2018	3:19:48 AM	120600.001	9.8
1/21/2018	3:24:48 AM	120900.001	9.799
1/21/2018	3:29:48 AM	121200.001	9.8
1/21/2018	3:34:48 AM	121500.001	9.797
1/21/2018	3:39:48 AM	121800.001	9.805
1/21/2018	3:44:48 AM	122100.001	9.8
1/21/2018	3:49:48 AM	122400.001	9.799
1/21/2018	3:54:48 AM	122700.001	9.806
1/21/2018	3:59:48 AM	123000.001	9.806
1/21/2018	4:04:48 AM	123300.001	9.804
1/21/2018	4:09:48 AM	123600.001	9.81
1/21/2018	4:14:48 AM	123900.001	9.806
1/21/2018	4:19:48 AM	124200.001	9.808
1/21/2018	4:24:48 AM	124500.001	9.809
1/21/2018	4:29:48 AM	124800.001	9.805
1/21/2018	4:34:48 AM	125100.001	9.802
1/21/2018	4:39:48 AM	125400.001	9.801
1/21/2018	4:44:48 AM	125700.001	9.798
1/21/2018	4:49:48 AM	126000.001	9.799
1/21/2018	4:54:48 AM	126300.001	9.801
1/21/2018	4:59:48 AM	126600.001	9.803
1/21/2018	5:04:48 AM	126900.001	9.799
1/21/2018	5:09:48 AM	127200.001	9.802
1/21/2018	5:14:48 AM	127500.001	9.795
1/21/2018	5:19:48 AM	127800.001	9.799
1/21/2018	5:24:48 AM	128100.001	9.795
1/21/2018	5:29:48 AM	128400.001	9.801
1/21/2018	5:34:48 AM	128700.001	9.8
1/21/2018	5:39:48 AM	129000.001	9.804

17PZ03 Ambient.txt

1/21/2018	5:44:48 AM	129300.001	9.798
1/21/2018	5:49:48 AM	129600.001	9.804
1/21/2018	5:54:48 AM	129900.001	9.802
1/21/2018	5:59:48 AM	130200.001	9.8
1/21/2018	6:04:48 AM	130500.001	9.804
1/21/2018	6:09:48 AM	130800.001	9.804
1/21/2018	6:14:48 AM	131100.001	9.805
1/21/2018	6:19:48 AM	131400.001	9.801
1/21/2018	6:24:48 AM	131700.001	9.803
1/21/2018	6:29:48 AM	132000.001	9.805
1/21/2018	6:34:48 AM	132300.001	9.801
1/21/2018	6:39:48 AM	132600.001	9.801
1/21/2018	6:44:48 AM	132900.001	9.801
1/21/2018	6:49:48 AM	133200.001	9.807
1/21/2018	6:54:48 AM	133500.001	9.801
1/21/2018	6:59:48 AM	133800.001	9.801
1/21/2018	7:04:48 AM	134100.001	9.798
1/21/2018	7:09:48 AM	134400.001	9.803
1/21/2018	7:14:48 AM	134700.001	9.795
1/21/2018	7:19:48 AM	135000.001	9.804
1/21/2018	7:24:48 AM	135300.001	9.797
1/21/2018	7:29:48 AM	135600.001	9.794
1/21/2018	7:34:48 AM	135900.001	9.796
1/21/2018	7:39:48 AM	136200.001	9.799
1/21/2018	7:44:48 AM	136500.001	9.796
1/21/2018	7:49:48 AM	136800.001	9.798
1/21/2018	7:54:48 AM	137100.001	9.797
1/21/2018	7:59:48 AM	137400.001	9.796
1/21/2018	8:04:48 AM	137700.001	9.797
1/21/2018	8:09:48 AM	138000.001	9.799
1/21/2018	8:14:48 AM	138300.001	9.798
1/21/2018	8:19:48 AM	138600.001	9.795
1/21/2018	8:24:48 AM	138900.001	9.796
1/21/2018	8:29:48 AM	139200.001	9.799
1/21/2018	8:34:48 AM	139500.001	9.797
1/21/2018	8:39:48 AM	139800.001	9.799
1/21/2018	8:44:48 AM	140100.001	9.796
1/21/2018	8:49:48 AM	140400.001	9.794
1/21/2018	8:54:48 AM	140700.001	9.796
1/21/2018	8:59:48 AM	141000.001	9.797
1/21/2018	9:04:48 AM	141300.001	9.795
1/21/2018	9:09:48 AM	141600.001	9.793
1/21/2018	9:14:48 AM	141900.001	9.791
1/21/2018	9:19:48 AM	142200.001	9.788
1/21/2018	9:24:48 AM	142500.001	9.784
1/21/2018	9:29:48 AM	142800.001	9.789
1/21/2018	9:34:48 AM	143100.001	9.79
1/21/2018	9:39:48 AM	143400.001	9.787

17PZ03 Ambient.txt

1/21/2018	9:44:48 AM	143700.001	9.787
1/21/2018	9:49:48 AM	144000.001	9.781
1/21/2018	9:54:48 AM	144300.001	9.782
1/21/2018	9:59:48 AM	144600.001	9.777
1/21/2018	10:04:48 AM	144900.001	9.784
1/21/2018	10:09:48 AM	145200.001	9.78
1/21/2018	10:14:48 AM	145500.001	9.781
1/21/2018	10:19:48 AM	145800.001	9.784
1/21/2018	10:24:48 AM	146100.001	9.785
1/21/2018	10:29:48 AM	146400.001	9.785
1/21/2018	10:34:48 AM	146700.001	9.783
1/21/2018	10:39:48 AM	147000.001	9.786
1/21/2018	10:44:48 AM	147300.001	9.789
1/21/2018	10:49:48 AM	147600.001	9.793
1/21/2018	10:54:48 AM	147900.001	9.79
1/21/2018	10:59:48 AM	148200.001	9.796
1/21/2018	11:04:48 AM	148500.001	9.79
1/21/2018	11:09:48 AM	148800.001	9.795
1/21/2018	11:14:48 AM	149100.001	9.793
1/21/2018	11:19:48 AM	149400.001	9.796
1/21/2018	11:24:48 AM	149700.001	9.797
1/21/2018	11:29:48 AM	150000.001	9.799
1/21/2018	11:34:48 AM	150300.001	9.796
1/21/2018	11:39:48 AM	150600.001	9.797
1/21/2018	11:44:48 AM	150900.001	9.805
1/21/2018	11:49:48 AM	151200.001	9.808
1/21/2018	11:54:48 AM	151500.001	9.804
1/21/2018	11:59:48 AM	151800.001	9.802
1/21/2018	12:04:48 PM	152100.001	9.807
1/21/2018	12:09:48 PM	152400.001	9.806
1/21/2018	12:14:48 PM	152700.001	9.812
1/21/2018	12:19:48 PM	153000.001	9.812
1/21/2018	12:24:48 PM	153300.001	9.806
1/21/2018	12:29:48 PM	153600.001	9.807
1/21/2018	12:34:48 PM	153900.001	9.818
1/21/2018	12:39:48 PM	154200.001	9.816
1/21/2018	12:44:48 PM	154500.001	9.819
1/21/2018	12:49:48 PM	154800.001	9.817
1/21/2018	12:54:48 PM	155100.001	9.816
1/21/2018	12:59:48 PM	155400.001	9.818
1/21/2018	1:04:48 PM	155700.001	9.826
1/21/2018	1:09:48 PM	156000.001	9.82
1/21/2018	1:14:48 PM	156300.001	9.82
1/21/2018	1:19:48 PM	156600.001	9.821
1/21/2018	1:24:48 PM	156900.001	9.821
1/21/2018	1:29:48 PM	157200.001	9.822
1/21/2018	1:34:48 PM	157500.001	9.825
1/21/2018	1:39:48 PM	157800.001	9.824

17PZ03 Ambient.txt

1/21/2018	1:44:48 PM	158100.001	9.828
1/21/2018	1:49:48 PM	158400.001	9.824
1/21/2018	1:54:48 PM	158700.001	9.828
1/21/2018	1:59:48 PM	159000.001	9.831
1/21/2018	2:04:48 PM	159300.001	9.831
1/21/2018	2:09:48 PM	159600.001	9.835
1/21/2018	2:14:48 PM	159900.001	9.832
1/21/2018	2:19:48 PM	160200.001	9.834
1/21/2018	2:24:48 PM	160500.001	9.831
1/21/2018	2:29:48 PM	160800.001	9.829
1/21/2018	2:34:48 PM	161100.001	9.835
1/21/2018	2:39:48 PM	161400.001	9.831
1/21/2018	2:44:48 PM	161700.001	9.835
1/21/2018	2:49:48 PM	162000.001	9.835
1/21/2018	2:54:48 PM	162300.001	9.834
1/21/2018	2:59:48 PM	162600.001	9.84
1/21/2018	3:04:48 PM	162900.001	9.837
1/21/2018	3:09:48 PM	163200.001	9.833
1/21/2018	3:14:48 PM	163500.001	9.838
1/21/2018	3:19:48 PM	163800.001	9.832
1/21/2018	3:24:48 PM	164100.001	9.835
1/21/2018	3:29:48 PM	164400.001	9.833
1/21/2018	3:34:48 PM	164700.001	9.831
1/21/2018	3:39:48 PM	165000.001	9.828
1/21/2018	3:44:48 PM	165300.001	9.831
1/21/2018	3:49:48 PM	165600.001	9.833
1/21/2018	3:54:48 PM	165900.001	9.832
1/21/2018	3:59:48 PM	166200.001	9.835
1/21/2018	4:04:48 PM	166500.001	9.836
1/21/2018	4:09:48 PM	166800.001	9.837
1/21/2018	4:14:48 PM	167100.001	9.834
1/21/2018	4:19:48 PM	167400.001	9.834
1/21/2018	4:24:48 PM	167700.001	9.84
1/21/2018	4:29:48 PM	168000.001	9.837
1/21/2018	4:34:48 PM	168300.001	9.837
1/21/2018	4:39:48 PM	168600.001	9.84
1/21/2018	4:44:48 PM	168900.001	9.834
1/21/2018	4:49:48 PM	169200.001	9.836
1/21/2018	4:54:48 PM	169500.001	9.831
1/21/2018	4:59:48 PM	169800.001	9.836
1/21/2018	5:04:48 PM	170100.001	9.835
1/21/2018	5:09:48 PM	170400.001	9.834
1/21/2018	5:14:48 PM	170700.001	9.837
1/21/2018	5:19:48 PM	171000.001	9.835
1/21/2018	5:24:48 PM	171300.001	9.832
1/21/2018	5:29:48 PM	171600.001	9.829
1/21/2018	5:34:48 PM	171900.001	9.832
1/21/2018	5:39:48 PM	172200.001	9.832

17PZ03 Ambient.txt

1/21/2018	5:44:48 PM	172500.001	9.835
1/21/2018	5:49:48 PM	172800.001	9.834
1/21/2018	5:54:48 PM	173100.001	9.83
1/21/2018	5:59:48 PM	173400.001	9.831
1/21/2018	6:04:48 PM	173700.001	9.831
1/21/2018	6:09:48 PM	174000.001	9.834
1/21/2018	6:14:48 PM	174300.001	9.836
1/21/2018	6:19:48 PM	174600.001	9.831
1/21/2018	6:24:48 PM	174900.001	9.838
1/21/2018	6:29:48 PM	175200.001	9.834
1/21/2018	6:34:48 PM	175500.001	9.839
1/21/2018	6:39:48 PM	175800.001	9.842
1/21/2018	6:44:48 PM	176100.001	9.838
1/21/2018	6:49:48 PM	176400.001	9.838
1/21/2018	6:54:48 PM	176700.001	9.839
1/21/2018	6:59:48 PM	177000.001	9.83
1/21/2018	7:04:48 PM	177300.001	9.831
1/21/2018	7:09:48 PM	177600.001	9.834
1/21/2018	7:14:48 PM	177900.001	9.833
1/21/2018	7:19:48 PM	178200.001	9.839
1/21/2018	7:24:48 PM	178500.001	9.833
1/21/2018	7:29:48 PM	178800.001	9.831
1/21/2018	7:34:48 PM	179100.001	9.837
1/21/2018	7:39:48 PM	179400.001	9.835
1/21/2018	7:44:48 PM	179700.001	9.839
1/21/2018	7:49:48 PM	180000.001	9.836
1/21/2018	7:54:48 PM	180300.001	9.844
1/21/2018	7:59:48 PM	180600.001	9.843
1/21/2018	8:04:48 PM	180900.001	9.841
1/21/2018	8:09:48 PM	181200.001	9.848
1/21/2018	8:14:48 PM	181500.001	9.847
1/21/2018	8:19:48 PM	181800.001	9.846
1/21/2018	8:24:48 PM	182100.001	9.845
1/21/2018	8:29:48 PM	182400.001	9.848
1/21/2018	8:34:48 PM	182700.001	9.845
1/21/2018	8:39:48 PM	183000.001	9.849
1/21/2018	8:44:48 PM	183300.001	9.844
1/21/2018	8:49:48 PM	183600.001	9.838
1/21/2018	8:54:48 PM	183900.001	9.844
1/21/2018	8:59:48 PM	184200.001	9.849
1/21/2018	9:04:48 PM	184500.001	9.846
1/21/2018	9:09:48 PM	184800.001	9.85
1/21/2018	9:14:48 PM	185100.001	9.847
1/21/2018	9:19:48 PM	185400.001	9.852
1/21/2018	9:24:48 PM	185700.001	9.855
1/21/2018	9:29:48 PM	186000.001	9.852
1/21/2018	9:34:48 PM	186300.001	9.85
1/21/2018	9:39:48 PM	186600.001	9.845

17PZ03 Ambient.txt

1/21/2018	9:44:48 PM	186900.001	9.846
1/21/2018	9:49:48 PM	187200.001	9.84
1/21/2018	9:54:48 PM	187500.001	9.842
1/21/2018	9:59:48 PM	187800.001	9.841
1/21/2018	10:04:48 PM	188100.001	9.838
1/21/2018	10:09:48 PM	188400.001	9.843
1/21/2018	10:14:48 PM	188700.001	9.842
1/21/2018	10:19:48 PM	189000.001	9.838
1/21/2018	10:24:48 PM	189300.001	9.844
1/21/2018	10:29:48 PM	189600.001	9.842
1/21/2018	10:34:48 PM	189900.001	9.848
1/21/2018	10:39:48 PM	190200.001	9.847
1/21/2018	10:44:48 PM	190500.001	9.852
1/21/2018	10:49:48 PM	190800.001	9.845
1/21/2018	10:54:48 PM	191100.001	9.847
1/21/2018	10:59:48 PM	191400.001	9.85
1/21/2018	11:04:48 PM	191700.001	9.848
1/21/2018	11:09:48 PM	192000.001	9.852
1/21/2018	11:14:48 PM	192300.001	9.85
1/21/2018	11:19:48 PM	192600.001	9.848
1/21/2018	11:24:48 PM	192900.001	9.851
1/21/2018	11:29:48 PM	193200.001	9.853
1/21/2018	11:34:48 PM	193500.001	9.857
1/21/2018	11:39:48 PM	193800.001	9.859
1/21/2018	11:44:48 PM	194100.001	9.861
1/21/2018	11:49:48 PM	194400.001	9.856
1/21/2018	11:54:48 PM	194700.001	9.855
1/21/2018	11:59:48 PM	195000.001	9.849
1/22/2018	12:04:48 AM	195300.001	9.856
1/22/2018	12:09:48 AM	195600.001	9.849
1/22/2018	12:14:48 AM	195900.001	9.845
1/22/2018	12:19:48 AM	196200.001	9.845
1/22/2018	12:24:48 AM	196500.001	9.837
1/22/2018	12:29:48 AM	196800.001	9.838
1/22/2018	12:34:48 AM	197100.001	9.84
1/22/2018	12:39:48 AM	197400.001	9.844
1/22/2018	12:44:48 AM	197700.001	9.839
1/22/2018	12:49:48 AM	198000.001	9.842
1/22/2018	12:54:48 AM	198300.001	9.844
1/22/2018	12:59:48 AM	198600.001	9.848
1/22/2018	1:04:48 AM	198900.001	9.845
1/22/2018	1:09:48 AM	199200.001	9.845
1/22/2018	1:14:48 AM	199500.001	9.847
1/22/2018	1:19:48 AM	199800.001	9.848
1/22/2018	1:24:48 AM	200100.001	9.847
1/22/2018	1:29:48 AM	200400.001	9.853
1/22/2018	1:34:48 AM	200700.001	9.842
1/22/2018	1:39:48 AM	201000.001	9.834

17PZ03 Ambient.txt

1/22/2018	1:44:48 AM	201300.001	9.833
1/22/2018	1:49:48 AM	201600.001	9.832
1/22/2018	1:54:48 AM	201900.001	9.837
1/22/2018	1:59:48 AM	202200.001	9.842
1/22/2018	2:04:48 AM	202500.001	9.841
1/22/2018	2:09:48 AM	202800.001	9.838
1/22/2018	2:14:48 AM	203100.001	9.838
1/22/2018	2:19:48 AM	203400.001	9.835
1/22/2018	2:24:48 AM	203700.001	9.843
1/22/2018	2:29:48 AM	204000.001	9.836
1/22/2018	2:34:48 AM	204300.001	9.839
1/22/2018	2:39:48 AM	204600.001	9.84
1/22/2018	2:44:48 AM	204900.001	9.837
1/22/2018	2:49:48 AM	205200.001	9.839
1/22/2018	2:54:48 AM	205500.001	9.835
1/22/2018	2:59:48 AM	205800.001	9.835
1/22/2018	3:04:48 AM	206100.001	9.834
1/22/2018	3:09:48 AM	206400.001	9.837
1/22/2018	3:14:48 AM	206700.001	9.837
1/22/2018	3:19:48 AM	207000.001	9.839
1/22/2018	3:24:48 AM	207300.001	9.841
1/22/2018	3:29:48 AM	207600.001	9.843
1/22/2018	3:34:48 AM	207900.001	9.836
1/22/2018	3:39:48 AM	208200.001	9.842
1/22/2018	3:44:48 AM	208500.001	9.837
1/22/2018	3:49:48 AM	208800.001	9.835
1/22/2018	3:54:48 AM	209100.001	9.833
1/22/2018	3:59:48 AM	209400.001	9.831
1/22/2018	4:04:48 AM	209700.001	9.836
1/22/2018	4:09:48 AM	210000.001	9.831
1/22/2018	4:14:48 AM	210300.001	9.831
1/22/2018	4:19:48 AM	210600.001	9.83
1/22/2018	4:24:48 AM	210900.001	9.829
1/22/2018	4:29:48 AM	211200.001	9.833
1/22/2018	4:34:48 AM	211500.001	9.83
1/22/2018	4:39:48 AM	211800.001	9.827
1/22/2018	4:44:48 AM	212100.001	9.832
1/22/2018	4:49:48 AM	212400.001	9.829
1/22/2018	4:54:48 AM	212700.001	9.83
1/22/2018	4:59:48 AM	213000.001	9.832
1/22/2018	5:04:48 AM	213300.001	9.828
1/22/2018	5:09:48 AM	213600.001	9.822
1/22/2018	5:14:48 AM	213900.001	9.825
1/22/2018	5:19:48 AM	214200.001	9.825
1/22/2018	5:24:48 AM	214500.001	9.819
1/22/2018	5:29:48 AM	214800.001	9.822
1/22/2018	5:34:48 AM	215100.001	9.824
1/22/2018	5:39:48 AM	215400.001	9.814

17PZ03 Ambient.txt

1/22/2018	5:44:48 AM	215700.001	9.815
1/22/2018	5:49:48 AM	216000.001	9.814
1/22/2018	5:54:48 AM	216300.001	9.815
1/22/2018	5:59:48 AM	216600.001	9.81
1/22/2018	6:04:48 AM	216900.001	9.809
1/22/2018	6:09:48 AM	217200.001	9.811
1/22/2018	6:14:48 AM	217500.001	9.806
1/22/2018	6:19:48 AM	217800.001	9.811
1/22/2018	6:24:48 AM	218100.001	9.809
1/22/2018	6:29:48 AM	218400.001	9.81
1/22/2018	6:34:48 AM	218700.001	9.813
1/22/2018	6:39:48 AM	219000.001	9.81
1/22/2018	6:44:48 AM	219300.001	9.809
1/22/2018	6:49:48 AM	219600.001	9.806
1/22/2018	6:54:48 AM	219900.001	9.807
1/22/2018	6:59:48 AM	220200.001	9.811
1/22/2018	7:04:48 AM	220500.001	9.807
1/22/2018	7:09:48 AM	220800.001	9.802
1/22/2018	7:14:48 AM	221100.001	9.805
1/22/2018	7:19:48 AM	221400.001	9.806
1/22/2018	7:24:48 AM	221700.001	9.807
1/22/2018	7:29:48 AM	222000.001	9.8
1/22/2018	7:34:48 AM	222300.001	9.805
1/22/2018	7:39:48 AM	222600.001	9.803
1/22/2018	7:44:48 AM	222900.001	9.8
1/22/2018	7:49:48 AM	223200.001	9.802
1/22/2018	7:54:48 AM	223500.001	9.801
1/22/2018	7:59:48 AM	223800.001	9.796
1/22/2018	8:04:48 AM	224100.001	9.798
1/22/2018	8:09:48 AM	224400.001	9.794
1/22/2018	8:14:48 AM	224700.001	9.792
1/22/2018	8:19:48 AM	225000.001	9.789
1/22/2018	8:24:48 AM	225300.001	9.795
1/22/2018	8:29:48 AM	225600.001	9.789
1/22/2018	8:34:48 AM	225900.001	9.788
1/22/2018	8:39:48 AM	226200.001	9.785
1/22/2018	8:44:48 AM	226500.001	9.784
1/22/2018	8:49:48 AM	226800.001	9.783
1/22/2018	8:54:48 AM	227100.001	9.786
1/22/2018	8:59:48 AM	227400.001	9.786
1/22/2018	9:04:48 AM	227700.001	9.784
1/22/2018	9:09:48 AM	228000.001	9.789
1/22/2018	9:14:48 AM	228300.001	9.783
1/22/2018	9:19:48 AM	228600.001	9.785
1/22/2018	9:24:48 AM	228900.001	9.782
1/22/2018	9:29:48 AM	229200.001	9.778
1/22/2018	9:34:48 AM	229500.001	9.78
1/22/2018	9:39:48 AM	229800.001	9.777

17PZ03 Ambient.txt			
1/22/2018	9:44:48 AM	230100.001	9.778
1/22/2018	9:49:48 AM	230400.001	9.781
1/22/2018	9:54:48 AM	230700.001	9.781
1/22/2018	9:59:48 AM	231000.001	9.781
1/22/2018	10:04:48 AM	231300.001	9.776
1/22/2018	10:09:48 AM	231600.001	9.778
1/22/2018	10:14:48 AM	231900.001	9.777
1/22/2018	10:19:48 AM	232200.001	9.779
1/22/2018	10:24:48 AM	232500.001	9.781
1/22/2018	10:29:48 AM	232800.001	9.785
1/22/2018	10:34:48 AM	233100.001	9.792
1/22/2018	10:39:48 AM	233400.001	9.79

Date	Time	Seconds	17WW01 Ambient.txt	Depth (ft)
1/19/2018	6:16:56 PM		0	10.767
1/19/2018	6:21:56 PM		300.001	10.761
1/19/2018	6:26:56 PM		600.001	10.751
1/19/2018	6:31:56 PM		900.001	10.756
1/19/2018	6:36:56 PM		1200.001	10.753
1/19/2018	6:41:56 PM		1500.001	10.747
1/19/2018	6:46:56 PM		1800.001	10.748
1/19/2018	6:51:56 PM		2100.001	10.745
1/19/2018	6:56:56 PM		2400.001	10.74
1/19/2018	7:01:56 PM		2700.001	10.74
1/19/2018	7:06:56 PM		3000.001	10.744
1/19/2018	7:11:56 PM		3300.001	10.743
1/19/2018	7:16:56 PM		3600.001	10.739
1/19/2018	7:21:56 PM		3900.001	10.741
1/19/2018	7:26:56 PM		4200.001	10.739
1/19/2018	7:31:56 PM		4500.001	10.743
1/19/2018	7:36:56 PM		4800.001	10.748
1/19/2018	7:41:56 PM		5100.001	10.735
1/19/2018	7:46:56 PM		5400.001	10.742
1/19/2018	7:51:56 PM		5700.001	10.741
1/19/2018	7:56:56 PM		6000.001	10.742
1/19/2018	8:01:56 PM		6300.001	10.739
1/19/2018	8:06:56 PM		6600.001	10.74
1/19/2018	8:11:56 PM		6900.001	10.747
1/19/2018	8:16:56 PM		7200.001	10.737
1/19/2018	8:21:56 PM		7500.001	10.74
1/19/2018	8:26:56 PM		7800.001	10.742
1/19/2018	8:31:56 PM		8100.001	10.741
1/19/2018	8:36:56 PM		8400.001	10.742
1/19/2018	8:41:56 PM		8700.001	10.74
1/19/2018	8:46:56 PM		9000.001	10.743
1/19/2018	8:51:56 PM		9300.001	10.739
1/19/2018	8:56:56 PM		9600.001	10.744
1/19/2018	9:01:56 PM		9900.001	10.741
1/19/2018	9:06:56 PM		10200.001	10.741
1/19/2018	9:11:56 PM		10500.001	10.736
1/19/2018	9:16:56 PM		10800.001	10.74
1/19/2018	9:21:56 PM		11100.001	10.74
1/19/2018	9:26:56 PM		11400.001	10.74
1/19/2018	9:31:56 PM		11700.001	10.741
1/19/2018	9:36:56 PM		12000.001	10.738
1/19/2018	9:41:56 PM		12300.001	10.738
1/19/2018	9:46:56 PM		12600.001	10.735
1/19/2018	9:51:56 PM		12900.001	10.737
1/19/2018	9:56:56 PM		13200.001	10.736
1/19/2018	10:01:56 PM		13500.001	10.742
1/19/2018	10:06:56 PM		13800.001	10.735

17WW01 Ambient.txt

1/19/2018	10:11:56 PM	14100.001	10.736
1/19/2018	10:16:56 PM	14400.001	10.735
1/19/2018	10:21:56 PM	14700.001	10.738
1/19/2018	10:26:56 PM	15000.001	10.736
1/19/2018	10:31:56 PM	15300.001	10.739
1/19/2018	10:36:56 PM	15600.001	10.737
1/19/2018	10:41:56 PM	15900.001	10.739
1/19/2018	10:46:56 PM	16200.001	10.739
1/19/2018	10:51:56 PM	16500.001	10.734
1/19/2018	10:56:56 PM	16800.001	10.741
1/19/2018	11:01:56 PM	17100.001	10.738
1/19/2018	11:06:56 PM	17400.001	10.736
1/19/2018	11:11:56 PM	17700.001	10.739
1/19/2018	11:16:56 PM	18000.001	10.738
1/19/2018	11:21:56 PM	18300.001	10.735
1/19/2018	11:26:56 PM	18600.001	10.737
1/19/2018	11:31:56 PM	18900.001	10.737
1/19/2018	11:36:56 PM	19200.001	10.741
1/19/2018	11:41:56 PM	19500.001	10.734
1/19/2018	11:46:56 PM	19800.001	10.739
1/19/2018	11:51:56 PM	20100.001	10.741
1/19/2018	11:56:56 PM	20400.001	10.737
1/20/2018	12:01:56 AM	20700.001	10.745
1/20/2018	12:06:56 AM	21000.001	10.746
1/20/2018	12:11:56 AM	21300.001	10.742
1/20/2018	12:16:56 AM	21600.001	10.74
1/20/2018	12:21:56 AM	21900.001	10.743
1/20/2018	12:26:56 AM	22200.001	10.743
1/20/2018	12:31:56 AM	22500.001	10.742
1/20/2018	12:36:56 AM	22800.001	10.741
1/20/2018	12:41:56 AM	23100.001	10.745
1/20/2018	12:46:56 AM	23400.001	10.744
1/20/2018	12:51:56 AM	23700.001	10.741
1/20/2018	12:56:56 AM	24000.001	10.743
1/20/2018	1:01:56 AM	24300.001	10.742
1/20/2018	1:06:56 AM	24600.001	10.754
1/20/2018	1:11:56 AM	24900.001	10.751
1/20/2018	1:16:56 AM	25200.001	10.754
1/20/2018	1:21:56 AM	25500.001	10.749
1/20/2018	1:26:56 AM	25800.001	10.755
1/20/2018	1:31:56 AM	26100.001	10.758
1/20/2018	1:36:56 AM	26400.001	10.761
1/20/2018	1:41:56 AM	26700.001	10.757
1/20/2018	1:46:56 AM	27000.001	10.758
1/20/2018	1:51:56 AM	27300.001	10.758
1/20/2018	1:56:56 AM	27600.001	10.758
1/20/2018	2:01:56 AM	27900.001	10.756
1/20/2018	2:06:56 AM	28200.001	10.758

17WW01 Ambient.txt

1/20/2018	2:11:56 AM	28500.001	10.755
1/20/2018	2:16:56 AM	28800.001	10.756
1/20/2018	2:21:56 AM	29100.001	10.76
1/20/2018	2:26:56 AM	29400.001	10.76
1/20/2018	2:31:56 AM	29700.001	10.763
1/20/2018	2:36:56 AM	30000.001	10.762
1/20/2018	2:41:56 AM	30300.001	10.763
1/20/2018	2:46:56 AM	30600.001	10.765
1/20/2018	2:51:56 AM	30900.001	10.759
1/20/2018	2:56:56 AM	31200.001	10.765
1/20/2018	3:01:56 AM	31500.001	10.761
1/20/2018	3:06:56 AM	31800.001	10.761
1/20/2018	3:11:56 AM	32100.001	10.762
1/20/2018	3:16:56 AM	32400.001	10.763
1/20/2018	3:21:56 AM	32700.001	10.758
1/20/2018	3:26:56 AM	33000.001	10.761
1/20/2018	3:31:56 AM	33300.001	10.761
1/20/2018	3:36:56 AM	33600.001	10.761
1/20/2018	3:41:56 AM	33900.001	10.763
1/20/2018	3:46:56 AM	34200.001	10.762
1/20/2018	3:51:56 AM	34500.001	10.756
1/20/2018	3:56:56 AM	34800.001	10.763
1/20/2018	4:01:56 AM	35100.001	10.764
1/20/2018	4:06:56 AM	35400.001	10.764
1/20/2018	4:11:56 AM	35700.001	10.756
1/20/2018	4:16:56 AM	36000.001	10.763
1/20/2018	4:21:56 AM	36300.001	10.764
1/20/2018	4:26:56 AM	36600.001	10.767
1/20/2018	4:31:56 AM	36900.001	10.764
1/20/2018	4:36:56 AM	37200.001	10.764
1/20/2018	4:41:56 AM	37500.001	10.767
1/20/2018	4:46:56 AM	37800.001	10.764
1/20/2018	4:51:56 AM	38100.001	10.766
1/20/2018	4:56:56 AM	38400.001	10.767
1/20/2018	5:01:56 AM	38700.001	10.763
1/20/2018	5:06:56 AM	39000.001	10.761
1/20/2018	5:11:56 AM	39300.001	10.766
1/20/2018	5:16:56 AM	39600.001	10.763
1/20/2018	5:21:56 AM	39900.001	10.764
1/20/2018	5:26:56 AM	40200.001	10.763
1/20/2018	5:31:56 AM	40500.001	10.76
1/20/2018	5:36:56 AM	40800.001	10.764
1/20/2018	5:41:56 AM	41100.001	10.767
1/20/2018	5:46:56 AM	41400.001	10.767
1/20/2018	5:51:56 AM	41700.001	10.765
1/20/2018	5:56:56 AM	42000.001	10.759
1/20/2018	6:01:56 AM	42300.001	10.762
1/20/2018	6:06:56 AM	42600.001	10.757

17WW01 Ambient.txt

1/20/2018	6:11:56 AM	42900.001	10.761
1/20/2018	6:16:56 AM	43200.001	10.755
1/20/2018	6:21:56 AM	43500.001	10.755
1/20/2018	6:26:56 AM	43800.001	10.756
1/20/2018	6:31:56 AM	44100.001	10.759
1/20/2018	6:36:56 AM	44400.001	10.761
1/20/2018	6:41:56 AM	44700.001	10.757
1/20/2018	6:46:56 AM	45000.001	10.759
1/20/2018	6:51:56 AM	45300.001	10.755
1/20/2018	6:56:56 AM	45600.001	10.758
1/20/2018	7:01:56 AM	45900.001	10.759
1/20/2018	7:06:56 AM	46200.001	10.756
1/20/2018	7:11:56 AM	46500.001	10.759
1/20/2018	7:16:56 AM	46800.001	10.757
1/20/2018	7:21:56 AM	47100.001	10.759
1/20/2018	7:26:56 AM	47400.001	10.756
1/20/2018	7:31:56 AM	47700.001	10.757
1/20/2018	7:36:56 AM	48000.001	10.753
1/20/2018	7:41:56 AM	48300.001	10.756
1/20/2018	7:46:56 AM	48600.001	10.755
1/20/2018	7:51:56 AM	48900.001	10.757
1/20/2018	7:56:56 AM	49200.001	10.754
1/20/2018	8:01:56 AM	49500.001	10.752
1/20/2018	8:06:56 AM	49800.001	10.752
1/20/2018	8:11:56 AM	50100.001	10.755
1/20/2018	8:16:56 AM	50400.001	10.756
1/20/2018	8:21:56 AM	50700.001	10.753
1/20/2018	8:26:56 AM	51000.001	10.753
1/20/2018	8:31:56 AM	51300.001	10.746
1/20/2018	8:36:56 AM	51600.001	10.747
1/20/2018	8:41:56 AM	51900.001	10.752
1/20/2018	8:46:56 AM	52200.001	10.751
1/20/2018	8:51:56 AM	52500.001	10.754
1/20/2018	8:56:56 AM	52800.001	10.749
1/20/2018	9:01:56 AM	53100.001	10.75
1/20/2018	9:06:56 AM	53400.001	10.747
1/20/2018	9:11:56 AM	53700.001	10.749
1/20/2018	9:16:56 AM	54000.001	10.749
1/20/2018	9:21:56 AM	54300.001	10.749
1/20/2018	9:26:56 AM	54600.001	10.746
1/20/2018	9:31:56 AM	54900.001	10.751
1/20/2018	9:36:56 AM	55200.001	10.765
1/20/2018	9:41:56 AM	55500.001	10.762
1/20/2018	9:46:56 AM	55800.001	10.768
1/20/2018	9:51:56 AM	56100.001	10.76
1/20/2018	9:56:56 AM	56400.001	10.759
1/20/2018	10:01:56 AM	56700.001	10.765
1/20/2018	10:06:56 AM	57000.001	10.762

17WW01 Ambient.txt

1/20/2018	10:11:56 AM	57300.001	10.755
1/20/2018	10:16:56 AM	57600.001	10.756
1/20/2018	10:21:56 AM	57900.001	10.76
1/20/2018	10:26:56 AM	58200.001	10.76
1/20/2018	10:31:56 AM	58500.001	10.755
1/20/2018	10:36:56 AM	58800.001	10.759
1/20/2018	10:41:56 AM	59100.001	10.759
1/20/2018	10:46:56 AM	59400.001	10.762
1/20/2018	10:51:56 AM	59700.001	10.763
1/20/2018	10:56:56 AM	60000.001	10.759
1/20/2018	11:01:56 AM	60300.001	10.764
1/20/2018	11:06:56 AM	60600.001	10.763
1/20/2018	11:11:56 AM	60900.001	10.765
1/20/2018	11:16:56 AM	61200.001	10.765
1/20/2018	11:21:56 AM	61500.001	10.764
1/20/2018	11:26:56 AM	61800.001	10.764
1/20/2018	11:31:56 AM	62100.001	10.767
1/20/2018	11:36:56 AM	62400.001	10.77
1/20/2018	11:41:56 AM	62700.001	10.769
1/20/2018	11:46:56 AM	63000.001	10.766
1/20/2018	11:51:56 AM	63300.001	10.771
1/20/2018	11:56:56 AM	63600.001	10.77
1/20/2018	12:01:56 PM	63900.001	10.778
1/20/2018	12:06:56 PM	64200.001	10.779
1/20/2018	12:11:56 PM	64500.001	10.783
1/20/2018	12:16:56 PM	64800.001	10.776
1/20/2018	12:21:56 PM	65100.001	10.78
1/20/2018	12:26:56 PM	65400.001	10.787
1/20/2018	12:31:56 PM	65700.001	10.782
1/20/2018	12:36:56 PM	66000.001	10.787
1/20/2018	12:41:56 PM	66300.001	10.79
1/20/2018	12:46:56 PM	66600.001	10.783
1/20/2018	12:51:56 PM	66900.001	10.782
1/20/2018	12:56:56 PM	67200.001	10.786
1/20/2018	1:01:56 PM	67500.001	10.785
1/20/2018	1:06:56 PM	67800.001	10.788
1/20/2018	1:11:56 PM	68100.001	10.79
1/20/2018	1:16:56 PM	68400.001	10.793
1/20/2018	1:21:56 PM	68700.001	10.791
1/20/2018	1:26:56 PM	69000.001	10.791
1/20/2018	1:31:56 PM	69300.001	10.789
1/20/2018	1:36:56 PM	69600.001	10.79
1/20/2018	1:41:56 PM	69900.001	10.793
1/20/2018	1:46:56 PM	70200.001	10.795
1/20/2018	1:51:56 PM	70500.001	10.798
1/20/2018	1:56:56 PM	70800.001	10.795
1/20/2018	2:01:56 PM	71100.001	10.798
1/20/2018	2:06:56 PM	71400.001	10.801

17WW01 Ambient.txt

1/20/2018	2:11:56 PM	71700.001	10.795
1/20/2018	2:16:56 PM	72000.001	10.797
1/20/2018	2:21:56 PM	72300.001	10.799
1/20/2018	2:26:56 PM	72600.001	10.796
1/20/2018	2:31:56 PM	72900.001	10.795
1/20/2018	2:36:56 PM	73200.001	10.801
1/20/2018	2:41:56 PM	73500.001	10.802
1/20/2018	2:46:56 PM	73800.001	10.799
1/20/2018	2:51:56 PM	74100.001	10.8
1/20/2018	2:56:56 PM	74400.001	10.797
1/20/2018	3:01:56 PM	74700.001	10.8
1/20/2018	3:06:56 PM	75000.001	10.797
1/20/2018	3:11:56 PM	75300.001	10.802
1/20/2018	3:16:56 PM	75600.001	10.791
1/20/2018	3:21:56 PM	75900.001	10.804
1/20/2018	3:26:56 PM	76200.001	10.8
1/20/2018	3:31:56 PM	76500.001	10.796
1/20/2018	3:36:56 PM	76800.001	10.802
1/20/2018	3:41:56 PM	77100.001	10.798
1/20/2018	3:46:56 PM	77400.001	10.802
1/20/2018	3:51:56 PM	77700.001	10.797
1/20/2018	3:56:56 PM	78000.001	10.8
1/20/2018	4:01:56 PM	78300.001	10.796
1/20/2018	4:06:56 PM	78600.001	10.803
1/20/2018	4:11:56 PM	78900.001	10.798
1/20/2018	4:16:56 PM	79200.001	10.796
1/20/2018	4:21:56 PM	79500.001	10.8
1/20/2018	4:26:56 PM	79800.001	10.805
1/20/2018	4:31:56 PM	80100.001	10.797
1/20/2018	4:36:56 PM	80400.001	10.788
1/20/2018	4:41:56 PM	80700.001	10.801
1/20/2018	4:46:56 PM	81000.001	10.797
1/20/2018	4:51:56 PM	81300.001	10.792
1/20/2018	4:56:56 PM	81600.001	10.794
1/20/2018	5:01:56 PM	81900.001	10.796
1/20/2018	5:06:56 PM	82200.001	10.794
1/20/2018	5:11:56 PM	82500.001	10.798
1/20/2018	5:16:56 PM	82800.001	10.794
1/20/2018	5:21:56 PM	83100.001	10.794
1/20/2018	5:26:56 PM	83400.001	10.789
1/20/2018	5:31:56 PM	83700.001	10.791
1/20/2018	5:36:56 PM	84000.001	10.789
1/20/2018	5:41:56 PM	84300.001	10.789
1/20/2018	5:46:56 PM	84600.001	10.788
1/20/2018	5:51:56 PM	84900.001	10.787
1/20/2018	5:56:56 PM	85200.001	10.787
1/20/2018	6:01:56 PM	85500.001	10.79
1/20/2018	6:06:56 PM	85800.001	10.787

17WW01 Ambient.txt

1/20/2018	6:11:56 PM	86100.001	10.785
1/20/2018	6:16:56 PM	86400.001	10.791
1/20/2018	6:21:56 PM	86700.001	10.783
1/20/2018	6:26:56 PM	87000.001	10.782
1/20/2018	6:31:56 PM	87300.001	10.784
1/20/2018	6:36:56 PM	87600.001	10.785
1/20/2018	6:41:56 PM	87900.001	10.786
1/20/2018	6:46:56 PM	88200.001	10.781
1/20/2018	6:51:56 PM	88500.001	10.784
1/20/2018	6:56:56 PM	88800.001	10.785
1/20/2018	7:01:56 PM	89100.001	10.779
1/20/2018	7:06:56 PM	89400.001	10.782
1/20/2018	7:11:56 PM	89700.001	10.783
1/20/2018	7:16:56 PM	90000.001	10.784
1/20/2018	7:21:56 PM	90300.001	10.78
1/20/2018	7:26:56 PM	90600.001	10.783
1/20/2018	7:31:56 PM	90900.001	10.783
1/20/2018	7:36:56 PM	91200.001	10.781
1/20/2018	7:41:56 PM	91500.001	10.782
1/20/2018	7:46:56 PM	91800.001	10.785
1/20/2018	7:51:56 PM	92100.001	10.783
1/20/2018	7:56:56 PM	92400.001	10.781
1/20/2018	8:01:56 PM	92700.001	10.782
1/20/2018	8:06:56 PM	93000.001	10.781
1/20/2018	8:11:56 PM	93300.001	10.781
1/20/2018	8:16:56 PM	93600.001	10.778
1/20/2018	8:21:56 PM	93900.001	10.778
1/20/2018	8:26:56 PM	94200.001	10.781
1/20/2018	8:31:56 PM	94500.001	10.778
1/20/2018	8:36:56 PM	94800.001	10.785
1/20/2018	8:41:56 PM	95100.001	10.777
1/20/2018	8:46:56 PM	95400.001	10.78
1/20/2018	8:51:56 PM	95700.001	10.773
1/20/2018	8:56:56 PM	96000.001	10.779
1/20/2018	9:01:56 PM	96300.001	10.779
1/20/2018	9:06:56 PM	96600.001	10.783
1/20/2018	9:11:56 PM	96900.001	10.781
1/20/2018	9:16:56 PM	97200.001	10.782
1/20/2018	9:21:56 PM	97500.001	10.785
1/20/2018	9:26:56 PM	97800.001	10.783
1/20/2018	9:31:56 PM	98100.001	10.785
1/20/2018	9:36:56 PM	98400.001	10.781
1/20/2018	9:41:56 PM	98700.001	10.782
1/20/2018	9:46:56 PM	99000.001	10.785
1/20/2018	9:51:56 PM	99300.001	10.785
1/20/2018	9:56:56 PM	99600.001	10.787
1/20/2018	10:01:56 PM	99900.001	10.783
1/20/2018	10:06:56 PM	100200.001	10.786

17WW01 Ambient.txt

1/20/2018	10:11:56 PM	100500.001	10.784
1/20/2018	10:16:56 PM	100800.001	10.788
1/20/2018	10:21:56 PM	101100.001	10.784
1/20/2018	10:26:56 PM	101400.001	10.787
1/20/2018	10:31:56 PM	101700.001	10.784
1/20/2018	10:36:56 PM	102000.001	10.785
1/20/2018	10:41:56 PM	102300.001	10.786
1/20/2018	10:46:56 PM	102600.001	10.783
1/20/2018	10:51:56 PM	102900.001	10.784
1/20/2018	10:56:56 PM	103200.001	10.785
1/20/2018	11:01:56 PM	103500.001	10.786
1/20/2018	11:06:56 PM	103800.001	10.777
1/20/2018	11:11:56 PM	104100.001	10.783
1/20/2018	11:16:56 PM	104400.001	10.784
1/20/2018	11:21:56 PM	104700.001	10.784
1/20/2018	11:26:56 PM	105000.001	10.786
1/20/2018	11:31:56 PM	105300.001	10.787
1/20/2018	11:36:56 PM	105600.001	10.786
1/20/2018	11:41:56 PM	105900.001	10.789
1/20/2018	11:46:56 PM	106200.001	10.784
1/20/2018	11:51:56 PM	106500.001	10.788
1/20/2018	11:56:56 PM	106800.001	10.788
1/21/2018	12:01:56 AM	107100.001	10.788
1/21/2018	12:06:56 AM	107400.001	10.785
1/21/2018	12:11:56 AM	107700.001	10.784
1/21/2018	12:16:56 AM	108000.001	10.788
1/21/2018	12:21:56 AM	108300.001	10.781
1/21/2018	12:26:56 AM	108600.001	10.783
1/21/2018	12:31:56 AM	108900.001	10.785
1/21/2018	12:36:56 AM	109200.001	10.786
1/21/2018	12:41:56 AM	109500.001	10.786
1/21/2018	12:46:56 AM	109800.001	10.786
1/21/2018	12:51:56 AM	110100.001	10.785
1/21/2018	12:56:56 AM	110400.001	10.78
1/21/2018	1:01:56 AM	110700.001	10.781
1/21/2018	1:06:56 AM	111000.001	10.783
1/21/2018	1:11:56 AM	111300.001	10.783
1/21/2018	1:16:56 AM	111600.001	10.786
1/21/2018	1:21:56 AM	111900.001	10.784
1/21/2018	1:26:56 AM	112200.001	10.785
1/21/2018	1:31:56 AM	112500.001	10.781
1/21/2018	1:36:56 AM	112800.001	10.783
1/21/2018	1:41:56 AM	113100.001	10.784
1/21/2018	1:46:56 AM	113400.001	10.785
1/21/2018	1:51:56 AM	113700.001	10.783
1/21/2018	1:56:56 AM	114000.001	10.784
1/21/2018	2:01:56 AM	114300.001	10.786
1/21/2018	2:06:56 AM	114600.001	10.784

17WW01 Ambient.txt

1/21/2018	2:11:56 AM	114900.001	10.782
1/21/2018	2:16:56 AM	115200.001	10.782
1/21/2018	2:21:56 AM	115500.001	10.783
1/21/2018	2:26:56 AM	115800.001	10.786
1/21/2018	2:31:56 AM	116100.001	10.787
1/21/2018	2:36:56 AM	116400.001	10.791
1/21/2018	2:41:56 AM	116700.001	10.786
1/21/2018	2:46:56 AM	117000.001	10.788
1/21/2018	2:51:56 AM	117300.001	10.784
1/21/2018	2:56:56 AM	117600.001	10.789
1/21/2018	3:01:56 AM	117900.001	10.788
1/21/2018	3:06:56 AM	118200.001	10.792
1/21/2018	3:11:56 AM	118500.001	10.794
1/21/2018	3:16:56 AM	118800.001	10.789
1/21/2018	3:21:56 AM	119100.001	10.789
1/21/2018	3:26:56 AM	119400.001	10.791
1/21/2018	3:31:56 AM	119700.001	10.791
1/21/2018	3:36:56 AM	120000.001	10.786
1/21/2018	3:41:56 AM	120300.001	10.792
1/21/2018	3:46:56 AM	120600.001	10.791
1/21/2018	3:51:56 AM	120900.001	10.792
1/21/2018	3:56:56 AM	121200.001	10.792
1/21/2018	4:01:56 AM	121500.001	10.791
1/21/2018	4:06:56 AM	121800.001	10.796
1/21/2018	4:11:56 AM	122100.001	10.796
1/21/2018	4:16:56 AM	122400.001	10.795
1/21/2018	4:21:56 AM	122700.001	10.797
1/21/2018	4:26:56 AM	123000.001	10.794
1/21/2018	4:31:56 AM	123300.001	10.796
1/21/2018	4:36:56 AM	123600.001	10.795
1/21/2018	4:41:56 AM	123900.001	10.788
1/21/2018	4:46:56 AM	124200.001	10.793
1/21/2018	4:51:56 AM	124500.001	10.79
1/21/2018	4:56:56 AM	124800.001	10.79
1/21/2018	5:01:56 AM	125100.001	10.786
1/21/2018	5:06:56 AM	125400.001	10.788
1/21/2018	5:11:56 AM	125700.001	10.793
1/21/2018	5:16:56 AM	126000.001	10.785
1/21/2018	5:21:56 AM	126300.001	10.788
1/21/2018	5:26:56 AM	126600.001	10.786
1/21/2018	5:31:56 AM	126900.001	10.792
1/21/2018	5:36:56 AM	127200.001	10.788
1/21/2018	5:41:56 AM	127500.001	10.788
1/21/2018	5:46:56 AM	127800.001	10.787
1/21/2018	5:51:56 AM	128100.001	10.789
1/21/2018	5:56:56 AM	128400.001	10.791
1/21/2018	6:01:56 AM	128700.001	10.791
1/21/2018	6:06:56 AM	129000.001	10.793

17WW01 Ambient.txt

1/21/2018	6:11:56 AM	129300.001	10.795
1/21/2018	6:16:56 AM	129600.001	10.789
1/21/2018	6:21:56 AM	129900.001	10.792
1/21/2018	6:26:56 AM	130200.001	10.789
1/21/2018	6:31:56 AM	130500.001	10.792
1/21/2018	6:36:56 AM	130800.001	10.794
1/21/2018	6:41:56 AM	131100.001	10.791
1/21/2018	6:46:56 AM	131400.001	10.793
1/21/2018	6:51:56 AM	131700.001	10.81
1/21/2018	6:56:56 AM	132000.001	10.81
1/21/2018	7:01:56 AM	132300.001	10.81
1/21/2018	7:06:56 AM	132600.001	10.808
1/21/2018	7:11:56 AM	132900.001	10.807
1/21/2018	7:16:56 AM	133200.001	10.807
1/21/2018	7:21:56 AM	133500.001	10.804
1/21/2018	7:26:56 AM	133800.001	10.805
1/21/2018	7:31:56 AM	134100.001	10.805
1/21/2018	7:36:56 AM	134400.001	10.804
1/21/2018	7:41:56 AM	134700.001	10.805
1/21/2018	7:46:56 AM	135000.001	10.805
1/21/2018	7:51:56 AM	135300.001	10.804
1/21/2018	7:56:56 AM	135600.001	10.802
1/21/2018	8:01:56 AM	135900.001	10.802
1/21/2018	8:06:56 AM	136200.001	10.804
1/21/2018	8:11:56 AM	136500.001	10.804
1/21/2018	8:16:56 AM	136800.001	10.804
1/21/2018	8:21:56 AM	137100.001	10.803
1/21/2018	8:26:56 AM	137400.001	10.804
1/21/2018	8:31:56 AM	137700.001	10.807
1/21/2018	8:36:56 AM	138000.001	10.8
1/21/2018	8:41:56 AM	138300.001	10.802
1/21/2018	8:46:56 AM	138600.001	10.801
1/21/2018	8:51:56 AM	138900.001	10.802
1/21/2018	8:56:56 AM	139200.001	10.799
1/21/2018	9:01:56 AM	139500.001	10.8
1/21/2018	9:06:56 AM	139800.001	10.804
1/21/2018	9:11:56 AM	140100.001	10.802
1/21/2018	9:16:56 AM	140400.001	10.798
1/21/2018	9:21:56 AM	140700.001	10.792
1/21/2018	9:26:56 AM	141000.001	10.797
1/21/2018	9:31:56 AM	141300.001	10.796
1/21/2018	9:36:56 AM	141600.001	10.79
1/21/2018	9:41:56 AM	141900.001	10.795
1/21/2018	9:46:56 AM	142200.001	10.789
1/21/2018	9:51:56 AM	142500.001	10.793
1/21/2018	9:56:56 AM	142800.001	10.791
1/21/2018	10:01:56 AM	143100.001	10.785
1/21/2018	10:06:56 AM	143400.001	10.788

17WW01 Ambient.txt

1/21/2018	10:11:56 AM	143700.001	10.782
1/21/2018	10:16:56 AM	144000.001	10.784
1/21/2018	10:21:56 AM	144300.001	10.785
1/21/2018	10:26:56 AM	144600.001	10.788
1/21/2018	10:31:56 AM	144900.001	10.788
1/21/2018	10:36:56 AM	145200.001	10.792
1/21/2018	10:41:56 AM	145500.001	10.785
1/21/2018	10:46:56 AM	145800.001	10.792
1/21/2018	10:51:56 AM	146100.001	10.789
1/21/2018	10:56:56 AM	146400.001	10.793
1/21/2018	11:01:56 AM	146700.001	10.794
1/21/2018	11:06:56 AM	147000.001	10.793
1/21/2018	11:11:56 AM	147300.001	10.799
1/21/2018	11:16:56 AM	147600.001	10.802
1/21/2018	11:21:56 AM	147900.001	10.798
1/21/2018	11:26:56 AM	148200.001	10.808
1/21/2018	11:31:56 AM	148500.001	10.804
1/21/2018	11:36:56 AM	148800.001	10.803
1/21/2018	11:41:56 AM	149100.001	10.805
1/21/2018	11:46:56 AM	149400.001	10.809
1/21/2018	11:51:56 AM	149700.001	10.808
1/21/2018	11:56:56 AM	150000.001	10.816
1/21/2018	12:01:56 PM	150300.001	10.814
1/21/2018	12:06:56 PM	150600.001	10.814
1/21/2018	12:11:56 PM	150900.001	10.817
1/21/2018	12:16:56 PM	151200.001	10.821
1/21/2018	12:21:56 PM	151500.001	10.812
1/21/2018	12:26:56 PM	151800.001	10.816
1/21/2018	12:31:56 PM	152100.001	10.813
1/21/2018	12:36:56 PM	152400.001	10.82
1/21/2018	12:41:56 PM	152700.001	10.819
1/21/2018	12:46:56 PM	153000.001	10.815
1/21/2018	12:51:56 PM	153300.001	10.825
1/21/2018	12:56:56 PM	153600.001	10.83
1/21/2018	1:01:56 PM	153900.001	10.828
1/21/2018	1:06:56 PM	154200.001	10.835
1/21/2018	1:11:56 PM	154500.001	10.84
1/21/2018	1:16:56 PM	154800.001	10.838
1/21/2018	1:21:56 PM	155100.001	10.832
1/21/2018	1:26:56 PM	155400.001	10.838
1/21/2018	1:31:56 PM	155700.001	10.834
1/21/2018	1:36:56 PM	156000.001	10.836
1/21/2018	1:41:56 PM	156300.001	10.836
1/21/2018	1:46:56 PM	156600.001	10.832
1/21/2018	1:51:56 PM	156900.001	10.845
1/21/2018	1:56:56 PM	157200.001	10.835
1/21/2018	2:01:56 PM	157500.001	10.839
1/21/2018	2:06:56 PM	157800.001	10.843

17WW01 Ambient.txt

1/21/2018	2:11:56 PM	158100.001	10.838
1/21/2018	2:16:56 PM	158400.001	10.844
1/21/2018	2:21:56 PM	158700.001	10.844
1/21/2018	2:26:56 PM	159000.001	10.847
1/21/2018	2:31:56 PM	159300.001	10.846
1/21/2018	2:36:56 PM	159600.001	10.852
1/21/2018	2:41:56 PM	159900.001	10.841
1/21/2018	2:46:56 PM	160200.001	10.848
1/21/2018	2:51:56 PM	160500.001	10.849
1/21/2018	2:56:56 PM	160800.001	10.857
1/21/2018	3:01:56 PM	161100.001	10.844
1/21/2018	3:06:56 PM	161400.001	10.855
1/21/2018	3:11:56 PM	161700.001	10.855
1/21/2018	3:16:56 PM	162000.001	10.836
1/21/2018	3:21:56 PM	162300.001	10.84
1/21/2018	3:26:56 PM	162600.001	10.831
1/21/2018	3:31:56 PM	162900.001	10.849
1/21/2018	3:36:56 PM	163200.001	10.852
1/21/2018	3:41:56 PM	163500.001	10.845
1/21/2018	3:46:56 PM	163800.001	10.829
1/21/2018	3:51:56 PM	164100.001	10.836
1/21/2018	3:56:56 PM	164400.001	10.846
1/21/2018	4:01:56 PM	164700.001	10.851
1/21/2018	4:06:56 PM	165000.001	10.848
1/21/2018	4:11:56 PM	165300.001	10.851
1/21/2018	4:16:56 PM	165600.001	10.845
1/21/2018	4:21:56 PM	165900.001	10.846
1/21/2018	4:26:56 PM	166200.001	10.844
1/21/2018	4:31:56 PM	166500.001	10.847
1/21/2018	4:36:56 PM	166800.001	10.849
1/21/2018	4:41:56 PM	167100.001	10.847
1/21/2018	4:46:56 PM	167400.001	10.848
1/21/2018	4:51:56 PM	167700.001	10.848
1/21/2018	4:56:56 PM	168000.001	10.851
1/21/2018	5:01:56 PM	168300.001	10.851
1/21/2018	5:06:56 PM	168600.001	10.846
1/21/2018	5:11:56 PM	168900.001	10.846
1/21/2018	5:16:56 PM	169200.001	10.844
1/21/2018	5:21:56 PM	169500.001	10.838
1/21/2018	5:26:56 PM	169800.001	10.849
1/21/2018	5:31:56 PM	170100.001	10.845
1/21/2018	5:36:56 PM	170400.001	10.841
1/21/2018	5:41:56 PM	170700.001	10.84
1/21/2018	5:46:56 PM	171000.001	10.84
1/21/2018	5:51:56 PM	171300.001	10.844
1/21/2018	5:56:56 PM	171600.001	10.838
1/21/2018	6:01:56 PM	171900.001	10.84
1/21/2018	6:06:56 PM	172200.001	10.844

17WW01 Ambient.txt

1/21/2018	6:11:56 PM	172500.001	10.844
1/21/2018	6:16:56 PM	172800.001	10.847
1/21/2018	6:21:56 PM	173100.001	10.842
1/21/2018	6:26:56 PM	173400.001	10.847
1/21/2018	6:31:56 PM	173700.001	10.846
1/21/2018	6:36:56 PM	174000.001	10.84
1/21/2018	6:41:56 PM	174300.001	10.847
1/21/2018	6:46:56 PM	174600.001	10.848
1/21/2018	6:51:56 PM	174900.001	10.843
1/21/2018	6:56:56 PM	175200.001	10.846
1/21/2018	7:01:56 PM	175500.001	10.843
1/21/2018	7:06:56 PM	175800.001	10.843
1/21/2018	7:11:56 PM	176100.001	10.838
1/21/2018	7:16:56 PM	176400.001	10.844
1/21/2018	7:21:56 PM	176700.001	10.845
1/21/2018	7:26:56 PM	177000.001	10.841
1/21/2018	7:31:56 PM	177300.001	10.849
1/21/2018	7:36:56 PM	177600.001	10.846
1/21/2018	7:41:56 PM	177900.001	10.846
1/21/2018	7:46:56 PM	178200.001	10.845
1/21/2018	7:51:56 PM	178500.001	10.852
1/21/2018	7:56:56 PM	178800.001	10.847
1/21/2018	8:01:56 PM	179100.001	10.846
1/21/2018	8:06:56 PM	179400.001	10.85
1/21/2018	8:11:56 PM	179700.001	10.854
1/21/2018	8:16:56 PM	180000.001	10.851
1/21/2018	8:21:56 PM	180300.001	10.858
1/21/2018	8:26:56 PM	180600.001	10.852
1/21/2018	8:31:56 PM	180900.001	10.852
1/21/2018	8:36:56 PM	181200.001	10.852
1/21/2018	8:41:56 PM	181500.001	10.857
1/21/2018	8:46:56 PM	181800.001	10.858
1/21/2018	8:51:56 PM	182100.001	10.855
1/21/2018	8:56:56 PM	182400.001	10.853
1/21/2018	9:01:56 PM	182700.001	10.855
1/21/2018	9:06:56 PM	183000.001	10.854
1/21/2018	9:11:56 PM	183300.001	10.858
1/21/2018	9:16:56 PM	183600.001	10.857
1/21/2018	9:21:56 PM	183900.001	10.859
1/21/2018	9:26:56 PM	184200.001	10.86
1/21/2018	9:31:56 PM	184500.001	10.861
1/21/2018	9:36:56 PM	184800.001	10.854
1/21/2018	9:41:56 PM	185100.001	10.859
1/21/2018	9:46:56 PM	185400.001	10.858
1/21/2018	9:51:56 PM	185700.001	10.853
1/21/2018	9:56:56 PM	186000.001	10.85
1/21/2018	10:01:56 PM	186300.001	10.852
1/21/2018	10:06:56 PM	186600.001	10.847

17WW01 Ambient.txt

1/21/2018	10:11:56 PM	186900.001	10.851
1/21/2018	10:16:56 PM	187200.001	10.843
1/21/2018	10:21:56 PM	187500.001	10.85
1/21/2018	10:26:56 PM	187800.001	10.851
1/21/2018	10:31:56 PM	188100.001	10.852
1/21/2018	10:36:56 PM	188400.001	10.845
1/21/2018	10:41:56 PM	188700.001	10.857
1/21/2018	10:46:56 PM	189000.001	10.856
1/21/2018	10:51:56 PM	189300.001	10.853
1/21/2018	10:56:56 PM	189600.001	10.856
1/21/2018	11:01:56 PM	189900.001	10.854
1/21/2018	11:06:56 PM	190200.001	10.857
1/21/2018	11:11:56 PM	190500.001	10.856
1/21/2018	11:16:56 PM	190800.001	10.863
1/21/2018	11:21:56 PM	191100.001	10.858
1/21/2018	11:26:56 PM	191400.001	10.853
1/21/2018	11:31:56 PM	191700.001	10.858
1/21/2018	11:36:56 PM	192000.001	10.865
1/21/2018	11:41:56 PM	192300.001	10.865
1/21/2018	11:46:56 PM	192600.001	10.866
1/21/2018	11:51:56 PM	192900.001	10.861
1/21/2018	11:56:56 PM	193200.001	10.857
1/22/2018	12:01:56 AM	193500.001	10.859
1/22/2018	12:06:56 AM	193800.001	10.857
1/22/2018	12:11:56 AM	194100.001	10.861
1/22/2018	12:16:56 AM	194400.001	10.857
1/22/2018	12:21:56 AM	194700.001	10.85
1/22/2018	12:26:56 AM	195000.001	10.856
1/22/2018	12:31:56 AM	195300.001	10.853
1/22/2018	12:36:56 AM	195600.001	10.853
1/22/2018	12:41:56 AM	195900.001	10.847
1/22/2018	12:46:56 AM	196200.001	10.848
1/22/2018	12:51:56 AM	196500.001	10.849
1/22/2018	12:56:56 AM	196800.001	10.853
1/22/2018	1:01:56 AM	197100.001	10.857
1/22/2018	1:06:56 AM	197400.001	10.855
1/22/2018	1:11:56 AM	197700.001	10.855
1/22/2018	1:16:56 AM	198000.001	10.853
1/22/2018	1:21:56 AM	198300.001	10.851
1/22/2018	1:26:56 AM	198600.001	10.856
1/22/2018	1:31:56 AM	198900.001	10.851
1/22/2018	1:36:56 AM	199200.001	10.842
1/22/2018	1:41:56 AM	199500.001	10.845
1/22/2018	1:46:56 AM	199800.001	10.846
1/22/2018	1:51:56 AM	200100.001	10.845
1/22/2018	1:56:56 AM	200400.001	10.842
1/22/2018	2:01:56 AM	200700.001	10.846
1/22/2018	2:06:56 AM	201000.001	10.846

17WW01 Ambient.txt

1/22/2018	2:11:56 AM	201300.001	10.845
1/22/2018	2:16:56 AM	201600.001	10.847
1/22/2018	2:21:56 AM	201900.001	10.841
1/22/2018	2:26:56 AM	202200.001	10.843
1/22/2018	2:31:56 AM	202500.001	10.842
1/22/2018	2:36:56 AM	202800.001	10.839
1/22/2018	2:41:56 AM	203100.001	10.846
1/22/2018	2:46:56 AM	203400.001	10.843
1/22/2018	2:51:56 AM	203700.001	10.836
1/22/2018	2:56:56 AM	204000.001	10.842
1/22/2018	3:01:56 AM	204300.001	10.839
1/22/2018	3:06:56 AM	204600.001	10.844
1/22/2018	3:11:56 AM	204900.001	10.843
1/22/2018	3:16:56 AM	205200.001	10.84
1/22/2018	3:21:56 AM	205500.001	10.841
1/22/2018	3:26:56 AM	205800.001	10.843
1/22/2018	3:31:56 AM	206100.001	10.843
1/22/2018	3:36:56 AM	206400.001	10.842
1/22/2018	3:41:56 AM	206700.001	10.841
1/22/2018	3:46:56 AM	207000.001	10.836
1/22/2018	3:51:56 AM	207300.001	10.837
1/22/2018	3:56:56 AM	207600.001	10.839
1/22/2018	4:01:56 AM	207900.001	10.833
1/22/2018	4:06:56 AM	208200.001	10.833
1/22/2018	4:11:56 AM	208500.001	10.833
1/22/2018	4:16:56 AM	208800.001	10.836
1/22/2018	4:21:56 AM	209100.001	10.833
1/22/2018	4:26:56 AM	209400.001	10.838
1/22/2018	4:31:56 AM	209700.001	10.834
1/22/2018	4:36:56 AM	210000.001	10.83
1/22/2018	4:41:56 AM	210300.001	10.834
1/22/2018	4:46:56 AM	210600.001	10.832
1/22/2018	4:51:56 AM	210900.001	10.828
1/22/2018	4:56:56 AM	211200.001	10.832
1/22/2018	5:01:56 AM	211500.001	10.828
1/22/2018	5:06:56 AM	211800.001	10.829
1/22/2018	5:11:56 AM	212100.001	10.828
1/22/2018	5:16:56 AM	212400.001	10.825
1/22/2018	5:21:56 AM	212700.001	10.825
1/22/2018	5:26:56 AM	213000.001	10.829
1/22/2018	5:31:56 AM	213300.001	10.822
1/22/2018	5:36:56 AM	213600.001	10.82
1/22/2018	5:41:56 AM	213900.001	10.823
1/22/2018	5:46:56 AM	214200.001	10.815
1/22/2018	5:51:56 AM	214500.001	10.816
1/22/2018	5:56:56 AM	214800.001	10.813
1/22/2018	6:01:56 AM	215100.001	10.812
1/22/2018	6:06:56 AM	215400.001	10.827

17WW01 Ambient.txt

1/22/2018	6:11:56 AM	215700.001	10.824
1/22/2018	6:16:56 AM	216000.001	10.825
1/22/2018	6:21:56 AM	216300.001	10.829
1/22/2018	6:26:56 AM	216600.001	10.824
1/22/2018	6:31:56 AM	216900.001	10.824
1/22/2018	6:36:56 AM	217200.001	10.824
1/22/2018	6:41:56 AM	217500.001	10.828
1/22/2018	6:46:56 AM	217800.001	10.822
1/22/2018	6:51:56 AM	218100.001	10.822
1/22/2018	6:56:56 AM	218400.001	10.819
1/22/2018	7:01:56 AM	218700.001	10.82
1/22/2018	7:06:56 AM	219000.001	10.821
1/22/2018	7:11:56 AM	219300.001	10.821
1/22/2018	7:16:56 AM	219600.001	10.819
1/22/2018	7:21:56 AM	219900.001	10.818
1/22/2018	7:26:56 AM	220200.001	10.822
1/22/2018	7:31:56 AM	220500.001	10.813
1/22/2018	7:36:56 AM	220800.001	10.82
1/22/2018	7:41:56 AM	221100.001	10.815
1/22/2018	7:46:56 AM	221400.001	10.813
1/22/2018	7:51:56 AM	221700.001	10.814
1/22/2018	7:56:56 AM	222000.001	10.817
1/22/2018	8:01:56 AM	222300.001	10.814
1/22/2018	8:06:56 AM	222600.001	10.81
1/22/2018	8:11:56 AM	222900.001	10.808
1/22/2018	8:16:56 AM	223200.001	10.806
1/22/2018	8:21:56 AM	223500.001	10.806
1/22/2018	8:26:56 AM	223800.001	10.809
1/22/2018	8:31:56 AM	224100.001	10.809
1/22/2018	8:36:56 AM	224400.001	10.802
1/22/2018	8:41:56 AM	224700.001	10.8
1/22/2018	8:46:56 AM	225000.001	10.806
1/22/2018	8:51:56 AM	225300.001	10.805
1/22/2018	8:56:56 AM	225600.001	10.801
1/22/2018	9:01:56 AM	225900.001	10.8
1/22/2018	9:06:56 AM	226200.001	10.799
1/22/2018	9:11:56 AM	226500.001	10.795
1/22/2018	9:16:56 AM	226800.001	10.795
1/22/2018	9:21:56 AM	227100.001	10.798
1/22/2018	9:26:56 AM	227400.001	10.798
1/22/2018	9:31:56 AM	227700.001	10.797
1/22/2018	9:36:56 AM	228000.001	10.798
1/22/2018	9:41:56 AM	228300.001	10.794
1/22/2018	9:46:56 AM	228600.001	10.794
1/22/2018	9:51:56 AM	228900.001	10.792
1/22/2018	9:56:56 AM	229200.001	10.791
1/22/2018	10:01:56 AM	229500	10.795
1/22/2018	10:06:56 AM	229800.001	10.789

		17WW01 Ambient.txt	
1/22/2018	10:11:56 AM	230100	10.79
1/22/2018	10:16:56 AM	230400.001	10.794
1/22/2018	10:21:56 AM	230700.001	10.796
1/22/2018	10:26:56 AM	231000.001	10.803
1/22/2018	10:31:56 AM	231300.001	10.795
1/22/2018	10:36:56 AM	231600.001	10.868
1/22/2018	10:41:56 AM	231900.001	10.87

17WW02 Ambient.txt

Date	Time	Elapsed Time	Depth (ft)
1/19/2018	5:54:00 PM	0	9.036
1/19/2018	5:59:00 PM	300.001	9.036
1/19/2018	6:04:00 PM	600.001	9.059
1/19/2018	6:09:00 PM	900.001	9.036
1/19/2018	6:14:00 PM	1200.001	9.032
1/19/2018	6:19:00 PM	1500.001	9.039
1/19/2018	6:24:00 PM	1800.001	9.035
1/19/2018	6:29:00 PM	2100.001	9.036
1/19/2018	6:34:00 PM	2400.001	9.037
1/19/2018	6:39:00 PM	2700.001	9.038
1/19/2018	6:44:00 PM	3000.001	9.034
1/19/2018	6:49:00 PM	3300.001	9.034
1/19/2018	6:54:00 PM	3600.001	9.035
1/19/2018	6:59:00 PM	3900.001	9.03
1/19/2018	7:04:00 PM	4200.001	9.028
1/19/2018	7:09:00 PM	4500.001	9.027
1/19/2018	7:14:00 PM	4800.001	9.032
1/19/2018	7:19:00 PM	5100.001	9.027
1/19/2018	7:24:00 PM	5400.001	9.027
1/19/2018	7:29:00 PM	5700.001	9.029
1/19/2018	7:34:00 PM	6000.001	9.026
1/19/2018	7:39:00 PM	6300.001	9.028
1/19/2018	7:44:00 PM	6600.001	9.03
1/19/2018	7:49:00 PM	6900.001	9.029
1/19/2018	7:54:00 PM	7200.001	9.026
1/19/2018	7:59:00 PM	7500.001	9.024
1/19/2018	8:04:00 PM	7800.001	9.023
1/19/2018	8:09:00 PM	8100.001	9.027
1/19/2018	8:14:00 PM	8400.001	9.026
1/19/2018	8:19:00 PM	8700.001	9.024
1/19/2018	8:24:00 PM	9000.001	9.024
1/19/2018	8:29:00 PM	9300.001	9.027
1/19/2018	8:34:00 PM	9600.001	9.024
1/19/2018	8:39:00 PM	9900.001	9.023
1/19/2018	8:44:00 PM	10200.001	9.023
1/19/2018	8:49:00 PM	10500.001	9.025
1/19/2018	8:54:00 PM	10800.001	9.025
1/19/2018	8:59:00 PM	11100.001	9.022
1/19/2018	9:04:00 PM	11400.001	9.021
1/19/2018	9:09:00 PM	11700.001	9.02
1/19/2018	9:14:00 PM	12000.001	9.025
1/19/2018	9:19:00 PM	12300.001	9.023
1/19/2018	9:24:00 PM	12600.001	9.018
1/19/2018	9:29:00 PM	12900.001	9.024
1/19/2018	9:34:00 PM	13200.001	9.023
1/19/2018	9:39:00 PM	13500.001	9.032
1/19/2018	9:44:00 PM	13800.001	9.028

17WW02 Ambient.txt

1/19/2018	9:49:00 PM	14100.001	9.023
1/19/2018	9:54:00 PM	14400.001	9.026
1/19/2018	9:59:00 PM	14700.001	9.022
1/19/2018	10:04:00 PM	15000.001	9.02
1/19/2018	10:09:00 PM	15300.001	9.025
1/19/2018	10:14:00 PM	15600.001	9.023
1/19/2018	10:19:00 PM	15900.001	9.021
1/19/2018	10:24:00 PM	16200.001	9.021
1/19/2018	10:29:00 PM	16500.001	9.021
1/19/2018	10:34:00 PM	16800.001	9.023
1/19/2018	10:39:00 PM	17100.001	9.02
1/19/2018	10:44:00 PM	17400.001	9.021
1/19/2018	10:49:00 PM	17700.001	9.02
1/19/2018	10:54:00 PM	18000.001	9.02
1/19/2018	10:59:00 PM	18300.001	9.021
1/19/2018	11:04:00 PM	18600.001	9.024
1/19/2018	11:09:00 PM	18900.001	9.021
1/19/2018	11:14:00 PM	19200.001	9.018
1/19/2018	11:19:00 PM	19500.001	9.014
1/19/2018	11:24:00 PM	19800.001	9.015
1/19/2018	11:29:00 PM	20100.001	9.015
1/19/2018	11:34:00 PM	20400.001	9.016
1/19/2018	11:39:00 PM	20700.001	9.017
1/19/2018	11:44:00 PM	21000.001	9.021
1/19/2018	11:49:00 PM	21300.001	9.022
1/19/2018	11:54:00 PM	21600.001	9.026
1/19/2018	11:59:00 PM	21900.001	9.021
1/20/2018	12:04:00 AM	22200.001	9.021
1/20/2018	12:09:00 AM	22500.001	9.023
1/20/2018	12:14:00 AM	22800.001	9.025
1/20/2018	12:19:00 AM	23100.001	9.02
1/20/2018	12:24:00 AM	23400.001	9.027
1/20/2018	12:29:00 AM	23700.001	9.021
1/20/2018	12:34:00 AM	24000.001	9.023
1/20/2018	12:39:00 AM	24300.001	9.028
1/20/2018	12:44:00 AM	24600.001	9.02
1/20/2018	12:49:00 AM	24900.001	9.021
1/20/2018	12:54:00 AM	25200.001	9.022
1/20/2018	12:59:00 AM	25500.001	9.023
1/20/2018	1:04:00 AM	25800.001	9.024
1/20/2018	1:09:00 AM	26100.001	9.026
1/20/2018	1:14:00 AM	26400.001	9.021
1/20/2018	1:19:00 AM	26700.001	9.024
1/20/2018	1:24:00 AM	27000.001	9.024
1/20/2018	1:29:00 AM	27300.001	9.026
1/20/2018	1:34:00 AM	27600.001	9.027
1/20/2018	1:39:00 AM	27900.001	9.027
1/20/2018	1:44:00 AM	28200.001	9.027

17WW02 Ambient.txt

1/20/2018	1:49:00 AM	28500.001	9.027
1/20/2018	1:54:00 AM	28800.001	9.029
1/20/2018	1:59:00 AM	29100.001	9.031
1/20/2018	2:04:00 AM	29400.001	9.028
1/20/2018	2:09:00 AM	29700.001	9.024
1/20/2018	2:14:00 AM	30000.001	9.028
1/20/2018	2:19:00 AM	30300.001	9.027
1/20/2018	2:24:00 AM	30600.001	9.027
1/20/2018	2:29:00 AM	30900.001	9.029
1/20/2018	2:34:00 AM	31200.001	9.029
1/20/2018	2:39:00 AM	31500.001	9.028
1/20/2018	2:44:00 AM	31800.001	9.032
1/20/2018	2:49:00 AM	32100.001	9.03
1/20/2018	2:54:00 AM	32400.001	9.03
1/20/2018	2:59:00 AM	32700.001	9.032
1/20/2018	3:04:00 AM	33000.001	9.034
1/20/2018	3:09:00 AM	33300.001	9.028
1/20/2018	3:14:00 AM	33600.001	9.033
1/20/2018	3:19:00 AM	33900.001	9.033
1/20/2018	3:24:00 AM	34200.001	9.038
1/20/2018	3:29:00 AM	34500.001	9.031
1/20/2018	3:34:00 AM	34800.001	9.029
1/20/2018	3:39:00 AM	35100.001	9.033
1/20/2018	3:44:00 AM	35400.001	9.031
1/20/2018	3:49:00 AM	35700.001	9.033
1/20/2018	3:54:00 AM	36000.001	9.033
1/20/2018	3:59:00 AM	36300.001	9.032
1/20/2018	4:04:00 AM	36600.001	9.033
1/20/2018	4:09:00 AM	36900.001	9.03
1/20/2018	4:14:00 AM	37200.001	9.028
1/20/2018	4:19:00 AM	37500.001	9.03
1/20/2018	4:24:00 AM	37800.001	9.033
1/20/2018	4:29:00 AM	38100.001	9.031
1/20/2018	4:34:00 AM	38400.001	9.034
1/20/2018	4:39:00 AM	38700.001	9.031
1/20/2018	4:44:00 AM	39000.001	9.033
1/20/2018	4:49:00 AM	39300.001	9.036
1/20/2018	4:54:00 AM	39600.001	9.034
1/20/2018	4:59:00 AM	39900.001	9.028
1/20/2018	5:04:00 AM	40200.001	9.033
1/20/2018	5:09:00 AM	40500.001	9.039
1/20/2018	5:14:00 AM	40800.001	9.039
1/20/2018	5:19:00 AM	41100.001	9.037
1/20/2018	5:24:00 AM	41400.001	9.036
1/20/2018	5:29:00 AM	41700.001	9.031
1/20/2018	5:34:00 AM	42000.001	9.035
1/20/2018	5:39:00 AM	42300.001	9.036
1/20/2018	5:44:00 AM	42600.001	9.037

17WW02 Ambient.txt

1/20/2018	5:49:00 AM	42900.001	9.032
1/20/2018	5:54:00 AM	43200.001	9.037
1/20/2018	5:59:00 AM	43500.001	9.035
1/20/2018	6:04:00 AM	43800.001	9.032
1/20/2018	6:09:00 AM	44100.001	9.036
1/20/2018	6:14:00 AM	44400.001	9.027
1/20/2018	6:19:00 AM	44700.001	9.033
1/20/2018	6:24:00 AM	45000.001	9.032
1/20/2018	6:29:00 AM	45300.001	9.031
1/20/2018	6:34:00 AM	45600.001	9.032
1/20/2018	6:39:00 AM	45900.001	9.031
1/20/2018	6:44:00 AM	46200.001	9.034
1/20/2018	6:49:00 AM	46500.001	9.031
1/20/2018	6:54:00 AM	46800.001	9.03
1/20/2018	6:59:00 AM	47100.001	9.029
1/20/2018	7:04:00 AM	47400.001	9.027
1/20/2018	7:09:00 AM	47700.001	9.032
1/20/2018	7:14:00 AM	48000.001	9.034
1/20/2018	7:19:00 AM	48300.001	9.03
1/20/2018	7:24:00 AM	48600.001	9.032
1/20/2018	7:29:00 AM	48900.001	9.028
1/20/2018	7:34:00 AM	49200.001	9.03
1/20/2018	7:39:00 AM	49500.001	9.027
1/20/2018	7:44:00 AM	49800.001	9.029
1/20/2018	7:49:00 AM	50100.001	9.031
1/20/2018	7:54:00 AM	50400.001	9.033
1/20/2018	7:59:00 AM	50700.001	9.025
1/20/2018	8:04:00 AM	51000.001	9.024
1/20/2018	8:09:00 AM	51300.001	9.028
1/20/2018	8:14:00 AM	51600.001	9.03
1/20/2018	8:19:00 AM	51900.001	9.028
1/20/2018	8:24:00 AM	52200.001	9.025
1/20/2018	8:29:00 AM	52500.001	9.029
1/20/2018	8:34:00 AM	52800.001	9.025
1/20/2018	8:39:00 AM	53100.001	9.024
1/20/2018	8:44:00 AM	53400.001	9.026
1/20/2018	8:49:00 AM	53700.001	9.025
1/20/2018	8:54:00 AM	54000.001	9.026
1/20/2018	8:59:00 AM	54300.001	9.033
1/20/2018	9:04:00 AM	54600.001	9.024
1/20/2018	9:09:00 AM	54900.001	9.021
1/20/2018	9:14:00 AM	55200.001	9.025
1/20/2018	9:19:00 AM	55500.001	9.021
1/20/2018	9:24:00 AM	55800.001	9.017
1/20/2018	9:29:00 AM	56100.001	9.02
1/20/2018	9:34:00 AM	56400.001	9.024
1/20/2018	9:39:00 AM	56700.001	9.024
1/20/2018	9:44:00 AM	57000.001	9.022

17WW02 Ambient.txt

1/20/2018	9:49:00 AM	57300.001	9.027
1/20/2018	9:54:00 AM	57600.001	9.022
1/20/2018	9:59:00 AM	57900.001	9.021
1/20/2018	10:04:00 AM	58200.001	9.021
1/20/2018	10:09:00 AM	58500.001	9.019
1/20/2018	10:14:00 AM	58800.001	9.025
1/20/2018	10:19:00 AM	59100.001	9.02
1/20/2018	10:24:00 AM	59400.001	9.019
1/20/2018	10:29:00 AM	59700.001	9.016
1/20/2018	10:34:00 AM	60000.001	9.018
1/20/2018	10:39:00 AM	60300.001	9.017
1/20/2018	10:44:00 AM	60600.001	9.02
1/20/2018	10:49:00 AM	60900.001	9.024
1/20/2018	10:54:00 AM	61200.001	9.021
1/20/2018	10:59:00 AM	61500.001	9.019
1/20/2018	11:04:00 AM	61800.001	9.016
1/20/2018	11:09:00 AM	62100.001	9.024
1/20/2018	11:14:00 AM	62400.001	9.019
1/20/2018	11:19:00 AM	62700.001	9.026
1/20/2018	11:24:00 AM	63000.001	9.022
1/20/2018	11:29:00 AM	63300.001	9.021
1/20/2018	11:34:00 AM	63600.001	9.015
1/20/2018	11:39:00 AM	63900.001	9.023
1/20/2018	11:44:00 AM	64200.001	9.019
1/20/2018	11:49:00 AM	64500.001	9.023
1/20/2018	11:54:00 AM	64800.001	9.026
1/20/2018	11:59:00 AM	65100.001	9.026
1/20/2018	12:04:00 PM	65400.001	9.027
1/20/2018	12:09:00 PM	65700.001	9.023
1/20/2018	12:14:00 PM	66000.001	9.029
1/20/2018	12:19:00 PM	66300.001	9.026
1/20/2018	12:24:00 PM	66600.001	9.029
1/20/2018	12:29:00 PM	66900.001	9.034
1/20/2018	12:34:00 PM	67200.001	9.03
1/20/2018	12:39:00 PM	67500.001	9.03
1/20/2018	12:44:00 PM	67800.001	9.032
1/20/2018	12:49:00 PM	68100.001	9.032
1/20/2018	12:54:00 PM	68400.001	9.035
1/20/2018	12:59:00 PM	68700.001	9.034
1/20/2018	1:04:00 PM	69000.001	9.036
1/20/2018	1:09:00 PM	69300.001	9.033
1/20/2018	1:14:00 PM	69600.001	9.037
1/20/2018	1:19:00 PM	69900.001	9.039
1/20/2018	1:24:00 PM	70200.001	9.039
1/20/2018	1:29:00 PM	70500.001	9.042
1/20/2018	1:34:00 PM	70800.001	9.042
1/20/2018	1:39:00 PM	71100.001	9.041
1/20/2018	1:44:00 PM	71400.001	9.042

17WW02 Ambient.txt

1/20/2018	1:49:00 PM	71700.001	9.043
1/20/2018	1:54:00 PM	72000.001	9.044
1/20/2018	1:59:00 PM	72300.001	9.037
1/20/2018	2:04:00 PM	72600.001	9.042
1/20/2018	2:09:00 PM	72900.001	9.045
1/20/2018	2:14:00 PM	73200.001	9.049
1/20/2018	2:19:00 PM	73500.001	9.045
1/20/2018	2:24:00 PM	73800.001	9.049
1/20/2018	2:29:00 PM	74100.001	9.046
1/20/2018	2:34:00 PM	74400.001	9.05
1/20/2018	2:39:00 PM	74700.001	9.046
1/20/2018	2:44:00 PM	75000.001	9.048
1/20/2018	2:49:00 PM	75300.001	9.047
1/20/2018	2:54:00 PM	75600.001	9.041
1/20/2018	2:59:00 PM	75900.001	9.05
1/20/2018	3:04:00 PM	76200.001	9.047
1/20/2018	3:09:00 PM	76500.001	9.048
1/20/2018	3:14:00 PM	76800.001	9.046
1/20/2018	3:19:00 PM	77100.001	9.052
1/20/2018	3:24:00 PM	77400.001	9.045
1/20/2018	3:29:00 PM	77700.001	9.046
1/20/2018	3:34:00 PM	78000.001	9.052
1/20/2018	3:39:00 PM	78300.001	9.052
1/20/2018	3:44:00 PM	78600.001	9.052
1/20/2018	3:49:00 PM	78900.001	9.051
1/20/2018	3:54:00 PM	79200.001	9.049
1/20/2018	3:59:00 PM	79500.001	9.053
1/20/2018	4:04:00 PM	79800.001	9.054
1/20/2018	4:09:00 PM	80100.001	9.05
1/20/2018	4:14:00 PM	80400.001	9.051
1/20/2018	4:19:00 PM	80700.001	9.036
1/20/2018	4:24:00 PM	81000.001	9.053
1/20/2018	4:29:00 PM	81300.001	9.055
1/20/2018	4:34:00 PM	81600.001	9.054
1/20/2018	4:39:00 PM	81900.001	9.045
1/20/2018	4:44:00 PM	82200.001	9.049
1/20/2018	4:49:00 PM	82500.001	9.047
1/20/2018	4:54:00 PM	82800.001	9.045
1/20/2018	4:59:00 PM	83100.001	9.053
1/20/2018	5:04:00 PM	83400.001	9.049
1/20/2018	5:09:00 PM	83700.001	9.053
1/20/2018	5:14:00 PM	84000.001	9.051
1/20/2018	5:19:00 PM	84300.001	9.051
1/20/2018	5:24:00 PM	84600.001	9.047
1/20/2018	5:29:00 PM	84900.001	9.044
1/20/2018	5:34:00 PM	85200.001	9.044
1/20/2018	5:39:00 PM	85500.001	9.047
1/20/2018	5:44:00 PM	85800.001	9.052

17WW02 Ambient.txt

1/20/2018	5:49:00 PM	86100.001	9.046
1/20/2018	5:54:00 PM	86400.001	9.049
1/20/2018	5:59:00 PM	86700.001	9.052
1/20/2018	6:04:00 PM	87000.001	9.048
1/20/2018	6:09:00 PM	87300.001	9.048
1/20/2018	6:14:00 PM	87600.001	9.049
1/20/2018	6:19:00 PM	87900.001	9.042
1/20/2018	6:24:00 PM	88200.001	9.045
1/20/2018	6:29:00 PM	88500.001	9.046
1/20/2018	6:34:00 PM	88800.001	9.047
1/20/2018	6:39:00 PM	89100.001	9.039
1/20/2018	6:44:00 PM	89400.001	9.047
1/20/2018	6:49:00 PM	89700.001	9.041
1/20/2018	6:54:00 PM	90000.001	9.042
1/20/2018	6:59:00 PM	90300.001	9.043
1/20/2018	7:04:00 PM	90600.001	9.043
1/20/2018	7:09:00 PM	90900.001	9.044
1/20/2018	7:14:00 PM	91200.001	9.044
1/20/2018	7:19:00 PM	91500.001	9.042
1/20/2018	7:24:00 PM	91800.001	9.045
1/20/2018	7:29:00 PM	92100.001	9.045
1/20/2018	7:34:00 PM	92400.001	9.043
1/20/2018	7:39:00 PM	92700.001	9.042
1/20/2018	7:44:00 PM	93000.001	9.045
1/20/2018	7:49:00 PM	93300.001	9.044
1/20/2018	7:54:00 PM	93600.001	9.05
1/20/2018	7:59:00 PM	93900.001	9.043
1/20/2018	8:04:00 PM	94200.001	9.045
1/20/2018	8:09:00 PM	94500.001	9.046
1/20/2018	8:14:00 PM	94800.001	9.042
1/20/2018	8:19:00 PM	95100.001	9.045
1/20/2018	8:24:00 PM	95400.001	9.042
1/20/2018	8:29:00 PM	95700.001	9.042
1/20/2018	8:34:00 PM	96000.001	9.044
1/20/2018	8:39:00 PM	96300.001	9.042
1/20/2018	8:44:00 PM	96600.001	9.042
1/20/2018	8:49:00 PM	96900.001	9.043
1/20/2018	8:54:00 PM	97200.001	9.042
1/20/2018	8:59:00 PM	97500.001	9.038
1/20/2018	9:04:00 PM	97800.001	9.043
1/20/2018	9:09:00 PM	98100.001	9.04
1/20/2018	9:14:00 PM	98400.001	9.041
1/20/2018	9:19:00 PM	98700.001	9.041
1/20/2018	9:24:00 PM	99000.001	9.041
1/20/2018	9:29:00 PM	99300.001	9.04
1/20/2018	9:34:00 PM	99600.001	9.042
1/20/2018	9:39:00 PM	99900.001	9.046
1/20/2018	9:44:00 PM	100200.001	9.044

17WW02 Ambient.txt

1/20/2018	9:49:00 PM	100500.001	9.047
1/20/2018	9:54:00 PM	100800.001	9.044
1/20/2018	9:59:00 PM	101100.001	9.04
1/20/2018	10:04:00 PM	101400.001	9.044
1/20/2018	10:09:00 PM	101700.001	9.046
1/20/2018	10:14:00 PM	102000.001	9.046
1/20/2018	10:19:00 PM	102300.001	9.047
1/20/2018	10:24:00 PM	102600.001	9.044
1/20/2018	10:29:00 PM	102900.001	9.044
1/20/2018	10:34:00 PM	103200.001	9.043
1/20/2018	10:39:00 PM	103500.001	9.042
1/20/2018	10:44:00 PM	103800.001	9.043
1/20/2018	10:49:00 PM	104100.001	9.044
1/20/2018	10:54:00 PM	104400.001	9.047
1/20/2018	10:59:00 PM	104700.001	9.044
1/20/2018	11:04:00 PM	105000.001	9.041
1/20/2018	11:09:00 PM	105300.001	9.044
1/20/2018	11:14:00 PM	105600.001	9.049
1/20/2018	11:19:00 PM	105900.001	9.043
1/20/2018	11:24:00 PM	106200.001	9.041
1/20/2018	11:29:00 PM	106500.001	9.043
1/20/2018	11:34:00 PM	106800.001	9.043
1/20/2018	11:39:00 PM	107100.001	9.043
1/20/2018	11:44:00 PM	107400.001	9.047
1/20/2018	11:49:00 PM	107700.001	9.04
1/20/2018	11:54:00 PM	108000.001	9.05
1/20/2018	11:59:00 PM	108300.001	9.047
1/21/2018	12:04:00 AM	108600.001	9.048
1/21/2018	12:09:00 AM	108900.001	9.046
1/21/2018	12:14:00 AM	109200.001	9.043
1/21/2018	12:19:00 AM	109500.001	9.041
1/21/2018	12:24:00 AM	109800.001	9.045
1/21/2018	12:29:00 AM	110100.001	9.044
1/21/2018	12:34:00 AM	110400.001	9.045
1/21/2018	12:39:00 AM	110700.001	9.044
1/21/2018	12:44:00 AM	111000.001	9.041
1/21/2018	12:49:00 AM	111300.001	9.041
1/21/2018	12:54:00 AM	111600.001	9.045
1/21/2018	12:59:00 AM	111900.001	9.043
1/21/2018	1:04:00 AM	112200.001	9.04
1/21/2018	1:09:00 AM	112500.001	9.044
1/21/2018	1:14:00 AM	112800.001	9.04
1/21/2018	1:19:00 AM	113100.001	9.038
1/21/2018	1:24:00 AM	113400.001	9.045
1/21/2018	1:29:00 AM	113700.001	9.04
1/21/2018	1:34:00 AM	114000.001	9.043
1/21/2018	1:39:00 AM	114300.001	9.046
1/21/2018	1:44:00 AM	114600.001	9.04

17WW02 Ambient.txt

1/21/2018	1:49:00 AM	114900.001	9.04
1/21/2018	1:54:00 AM	115200.001	9.041
1/21/2018	1:59:00 AM	115500.001	9.038
1/21/2018	2:04:00 AM	115800.001	9.043
1/21/2018	2:09:00 AM	116100.001	9.042
1/21/2018	2:14:00 AM	116400.001	9.036
1/21/2018	2:19:00 AM	116700.001	9.043
1/21/2018	2:24:00 AM	117000.001	9.044
1/21/2018	2:29:00 AM	117300.001	9.042
1/21/2018	2:34:00 AM	117600.001	9.042
1/21/2018	2:39:00 AM	117900.001	9.048
1/21/2018	2:44:00 AM	118200.001	9.04
1/21/2018	2:49:00 AM	118500.001	9.04
1/21/2018	2:54:00 AM	118800.001	9.041
1/21/2018	2:59:00 AM	119100.001	9.05
1/21/2018	3:04:00 AM	119400.001	9.043
1/21/2018	3:09:00 AM	119700.001	9.044
1/21/2018	3:14:00 AM	120000.001	9.049
1/21/2018	3:19:00 AM	120300.001	9.045
1/21/2018	3:24:00 AM	120600.001	9.041
1/21/2018	3:29:00 AM	120900.001	9.049
1/21/2018	3:34:00 AM	121200.001	9.044
1/21/2018	3:39:00 AM	121500.001	9.048
1/21/2018	3:44:00 AM	121800.001	9.046
1/21/2018	3:49:00 AM	122100.001	9.047
1/21/2018	3:54:00 AM	122400.001	9.045
1/21/2018	3:59:00 AM	122700.001	9.052
1/21/2018	4:04:00 AM	123000.001	9.045
1/21/2018	4:09:00 AM	123300.001	9.049
1/21/2018	4:14:00 AM	123600.001	9.049
1/21/2018	4:19:00 AM	123900.001	9.042
1/21/2018	4:24:00 AM	124200.001	9.047
1/21/2018	4:29:00 AM	124500.001	9.046
1/21/2018	4:34:00 AM	124800.001	9.051
1/21/2018	4:39:00 AM	125100.001	9.048
1/21/2018	4:44:00 AM	125400.001	9.05
1/21/2018	4:49:00 AM	125700.001	9.043
1/21/2018	4:54:00 AM	126000.001	9.047
1/21/2018	4:59:00 AM	126300.001	9.044
1/21/2018	5:04:00 AM	126600.001	9.051
1/21/2018	5:09:00 AM	126900.001	9.048
1/21/2018	5:14:00 AM	127200.001	9.048
1/21/2018	5:19:00 AM	127500.001	9.049
1/21/2018	5:24:00 AM	127800.001	9.052
1/21/2018	5:29:00 AM	128100.001	9.049
1/21/2018	5:34:00 AM	128400.001	9.048
1/21/2018	5:39:00 AM	128700.001	9.046
1/21/2018	5:44:00 AM	129000.001	9.05

17WW02 Ambient.txt

1/21/2018	5:49:00 AM	129300.001	9.049
1/21/2018	5:54:00 AM	129600.001	9.045
1/21/2018	5:59:00 AM	129900.001	9.046
1/21/2018	6:04:00 AM	130200.001	9.05
1/21/2018	6:09:00 AM	130500.001	9.045
1/21/2018	6:14:00 AM	130800.001	9.043
1/21/2018	6:19:00 AM	131100.001	9.056
1/21/2018	6:24:00 AM	131400.001	9.046
1/21/2018	6:29:00 AM	131700.001	9.048
1/21/2018	6:34:00 AM	132000.001	9.051
1/21/2018	6:39:00 AM	132300.001	9.046
1/21/2018	6:44:00 AM	132600.001	9.05
1/21/2018	6:49:00 AM	132900.001	9.047
1/21/2018	6:54:00 AM	133200.001	9.046
1/21/2018	6:59:00 AM	133500.001	9.047
1/21/2018	7:04:00 AM	133800.001	9.048
1/21/2018	7:09:00 AM	134100.001	9.042
1/21/2018	7:14:00 AM	134400.001	9.051
1/21/2018	7:19:00 AM	134700.001	9.046
1/21/2018	7:24:00 AM	135000.001	9.048
1/21/2018	7:29:00 AM	135300.001	9.046
1/21/2018	7:34:00 AM	135600.001	9.048
1/21/2018	7:39:00 AM	135900.001	9.047
1/21/2018	7:44:00 AM	136200.001	9.047
1/21/2018	7:49:00 AM	136500.001	9.046
1/21/2018	7:54:00 AM	136800.001	9.044
1/21/2018	7:59:00 AM	137100.001	9.044
1/21/2018	8:04:00 AM	137400.001	9.046
1/21/2018	8:09:00 AM	137700.001	9.047
1/21/2018	8:14:00 AM	138000.001	9.04
1/21/2018	8:19:00 AM	138300.001	9.044
1/21/2018	8:24:00 AM	138600.001	9.042
1/21/2018	8:29:00 AM	138900.001	9.046
1/21/2018	8:34:00 AM	139200.001	9.046
1/21/2018	8:39:00 AM	139500.001	9.044
1/21/2018	8:44:00 AM	139800.001	9.044
1/21/2018	8:49:00 AM	140100.001	9.038
1/21/2018	8:54:00 AM	140400.001	9.038
1/21/2018	8:59:00 AM	140700.001	9.041
1/21/2018	9:04:00 AM	141000.001	9.044
1/21/2018	9:09:00 AM	141300.001	9.044
1/21/2018	9:14:00 AM	141600.001	9.047
1/21/2018	9:19:00 AM	141900.001	9.043
1/21/2018	9:24:00 AM	142200.001	9.039
1/21/2018	9:29:00 AM	142500.001	9.04
1/21/2018	9:34:00 AM	142800.001	9.036
1/21/2018	9:39:00 AM	143100.001	9.041
1/21/2018	9:44:00 AM	143400.001	9.038

17WW02 Ambient.txt

1/21/2018	9:49:00 AM	143700.001	9.034
1/21/2018	9:54:00 AM	144000.001	9.035
1/21/2018	9:59:00 AM	144300.001	9.034
1/21/2018	10:04:00 AM	144600.001	9.033
1/21/2018	10:09:00 AM	144900.001	9.038
1/21/2018	10:14:00 AM	145200.001	9.029
1/21/2018	10:19:00 AM	145500.001	9.035
1/21/2018	10:24:00 AM	145800.001	9.031
1/21/2018	10:29:00 AM	146100.001	9.031
1/21/2018	10:34:00 AM	146400.001	9.032
1/21/2018	10:39:00 AM	146700.001	9.03
1/21/2018	10:44:00 AM	147000.001	9.032
1/21/2018	10:49:00 AM	147300.001	9.035
1/21/2018	10:54:00 AM	147600.001	9.033
1/21/2018	10:59:00 AM	147900.001	9.03
1/21/2018	11:04:00 AM	148200.001	9.029
1/21/2018	11:09:00 AM	148500.001	9.029
1/21/2018	11:14:00 AM	148800.001	9.034
1/21/2018	11:19:00 AM	149100.001	9.034
1/21/2018	11:24:00 AM	149400.001	9.028
1/21/2018	11:29:00 AM	149700.001	9.037
1/21/2018	11:34:00 AM	150000.001	9.044
1/21/2018	11:39:00 AM	150300.001	9.038
1/21/2018	11:44:00 AM	150600.001	9.037
1/21/2018	11:49:00 AM	150900.001	9.04
1/21/2018	11:54:00 AM	151200.001	9.041
1/21/2018	11:59:00 AM	151500.001	9.038
1/21/2018	12:04:00 PM	151800.001	9.048
1/21/2018	12:09:00 PM	152100.001	9.048
1/21/2018	12:14:00 PM	152400.001	9.046
1/21/2018	12:19:00 PM	152700.001	9.049
1/21/2018	12:24:00 PM	153000.001	9.046
1/21/2018	12:29:00 PM	153300.001	9.047
1/21/2018	12:34:00 PM	153600.001	9.047
1/21/2018	12:39:00 PM	153900.001	9.043
1/21/2018	12:44:00 PM	154200.001	9.048
1/21/2018	12:49:00 PM	154500.001	9.048
1/21/2018	12:54:00 PM	154800.001	9.052
1/21/2018	12:59:00 PM	155100.001	9.051
1/21/2018	1:04:00 PM	155400.001	9.06
1/21/2018	1:09:00 PM	155700.001	9.053
1/21/2018	1:14:00 PM	156000.001	9.058
1/21/2018	1:19:00 PM	156300.001	9.053
1/21/2018	1:24:00 PM	156600.001	9.062
1/21/2018	1:29:00 PM	156900.001	9.062
1/21/2018	1:34:00 PM	157200.001	9.067
1/21/2018	1:39:00 PM	157500.001	9.064
1/21/2018	1:44:00 PM	157800.001	9.052

17WW02 Ambient.txt

1/21/2018	1:49:00 PM	158100.001	9.057
1/21/2018	1:54:00 PM	158400.001	9.069
1/21/2018	1:59:00 PM	158700.001	9.067
1/21/2018	2:04:00 PM	159000.001	9.065
1/21/2018	2:09:00 PM	159300.001	9.069
1/21/2018	2:14:00 PM	159600.001	9.066
1/21/2018	2:19:00 PM	159900.001	9.063
1/21/2018	2:24:00 PM	160200.001	9.07
1/21/2018	2:29:00 PM	160500.001	9.071
1/21/2018	2:34:00 PM	160800.001	9.066
1/21/2018	2:39:00 PM	161100.001	9.079
1/21/2018	2:44:00 PM	161400.001	9.068
1/21/2018	2:49:00 PM	161700.001	9.075
1/21/2018	2:54:00 PM	162000.001	9.068
1/21/2018	2:59:00 PM	162300.001	9.071
1/21/2018	3:04:00 PM	162600.001	9.074
1/21/2018	3:09:00 PM	162900.001	9.081
1/21/2018	3:14:00 PM	163200.001	9.085
1/21/2018	3:19:00 PM	163500.001	9.072
1/21/2018	3:24:00 PM	163800.001	9.074
1/21/2018	3:29:00 PM	164100.001	9.088
1/21/2018	3:34:00 PM	164400.001	9.07
1/21/2018	3:39:00 PM	164700.001	9.087
1/21/2018	3:44:00 PM	165000.001	9.077
1/21/2018	3:49:00 PM	165300.001	9.078
1/21/2018	3:54:00 PM	165600.001	9.077
1/21/2018	3:59:00 PM	165900.001	9.081
1/21/2018	4:04:00 PM	166200.001	9.078
1/21/2018	4:09:00 PM	166500.001	9.082
1/21/2018	4:14:00 PM	166800.001	9.081
1/21/2018	4:19:00 PM	167100.001	9.074
1/21/2018	4:24:00 PM	167400.001	9.079
1/21/2018	4:29:00 PM	167700.001	9.08
1/21/2018	4:34:00 PM	168000.001	9.079
1/21/2018	4:39:00 PM	168300.001	9.084
1/21/2018	4:44:00 PM	168600.001	9.082
1/21/2018	4:49:00 PM	168900.001	9.082
1/21/2018	4:54:00 PM	169200.001	9.082
1/21/2018	4:59:00 PM	169500.001	9.079
1/21/2018	5:04:00 PM	169800.001	9.087
1/21/2018	5:09:00 PM	170100.001	9.084
1/21/2018	5:14:00 PM	170400.001	9.079
1/21/2018	5:19:00 PM	170700.001	9.084
1/21/2018	5:24:00 PM	171000.001	9.084
1/21/2018	5:29:00 PM	171300.001	9.075
1/21/2018	5:34:00 PM	171600.001	9.077
1/21/2018	5:39:00 PM	171900.001	9.084
1/21/2018	5:44:00 PM	172200.001	9.08

17WW02 Ambient.txt

1/21/2018	5:49:00 PM	172500.001	9.085
1/21/2018	5:54:00 PM	172800.001	9.08
1/21/2018	5:59:00 PM	173100.001	9.081
1/21/2018	6:04:00 PM	173400.001	9.079
1/21/2018	6:09:00 PM	173700.001	9.08
1/21/2018	6:14:00 PM	174000.001	9.075
1/21/2018	6:19:00 PM	174300.001	9.082
1/21/2018	6:24:00 PM	174600.001	9.078
1/21/2018	6:29:00 PM	174900.001	9.085
1/21/2018	6:34:00 PM	175200.001	9.081
1/21/2018	6:39:00 PM	175500.001	9.082
1/21/2018	6:44:00 PM	175800.001	9.082
1/21/2018	6:49:00 PM	176100.001	9.086
1/21/2018	6:54:00 PM	176400.001	9.083
1/21/2018	6:59:00 PM	176700.001	9.08
1/21/2018	7:04:00 PM	177000.001	9.086
1/21/2018	7:09:00 PM	177300.001	9.087
1/21/2018	7:14:00 PM	177600.001	9.083
1/21/2018	7:19:00 PM	177900.001	9.085
1/21/2018	7:24:00 PM	178200.001	9.083
1/21/2018	7:29:00 PM	178500.001	9.082
1/21/2018	7:34:00 PM	178800.001	9.082
1/21/2018	7:39:00 PM	179100.001	9.082
1/21/2018	7:44:00 PM	179400.001	9.086
1/21/2018	7:49:00 PM	179700.001	9.082
1/21/2018	7:54:00 PM	180000.001	9.083
1/21/2018	7:59:00 PM	180300.001	9.083
1/21/2018	8:04:00 PM	180600.001	9.089
1/21/2018	8:09:00 PM	180900.001	9.085
1/21/2018	8:14:00 PM	181200.001	9.084
1/21/2018	8:19:00 PM	181500.001	9.091
1/21/2018	8:24:00 PM	181800.001	9.087
1/21/2018	8:29:00 PM	182100.001	9.092
1/21/2018	8:34:00 PM	182400.001	9.088
1/21/2018	8:39:00 PM	182700.001	9.09
1/21/2018	8:44:00 PM	183000.001	9.086
1/21/2018	8:49:00 PM	183300.001	9.089
1/21/2018	8:54:00 PM	183600.001	9.088
1/21/2018	8:59:00 PM	183900.001	9.092
1/21/2018	9:04:00 PM	184200.001	9.087
1/21/2018	9:09:00 PM	184500.001	9.09
1/21/2018	9:14:00 PM	184800.001	9.09
1/21/2018	9:19:00 PM	185100.001	9.091
1/21/2018	9:24:00 PM	185400.001	9.09
1/21/2018	9:29:00 PM	185700.001	9.09
1/21/2018	9:34:00 PM	186000.001	9.094
1/21/2018	9:39:00 PM	186300.001	9.094
1/21/2018	9:44:00 PM	186600.001	9.096

17WW02 Ambient.txt

1/21/2018	9:49:00 PM	186900.001	9.093
1/21/2018	9:54:00 PM	187200.001	9.092
1/21/2018	9:59:00 PM	187500.001	9.089
1/21/2018	10:04:00 PM	187800.001	9.089
1/21/2018	10:09:00 PM	188100.001	9.088
1/21/2018	10:14:00 PM	188400.001	9.091
1/21/2018	10:19:00 PM	188700.001	9.093
1/21/2018	10:24:00 PM	189000.001	9.093
1/21/2018	10:29:00 PM	189300.001	9.091
1/21/2018	10:34:00 PM	189600.001	9.088
1/21/2018	10:39:00 PM	189900.001	9.089
1/21/2018	10:44:00 PM	190200.001	9.093
1/21/2018	10:49:00 PM	190500.001	9.089
1/21/2018	10:54:00 PM	190800.001	9.093
1/21/2018	10:59:00 PM	191100.001	9.09
1/21/2018	11:04:00 PM	191400.001	9.096
1/21/2018	11:09:00 PM	191700.001	9.093
1/21/2018	11:14:00 PM	192000.001	9.092
1/21/2018	11:19:00 PM	192300.001	9.094
1/21/2018	11:24:00 PM	192600.001	9.095
1/21/2018	11:29:00 PM	192900.001	9.097
1/21/2018	11:34:00 PM	193200.001	9.093
1/21/2018	11:39:00 PM	193500.001	9.098
1/21/2018	11:44:00 PM	193800.001	9.097
1/21/2018	11:49:00 PM	194100.001	9.095
1/21/2018	11:54:00 PM	194400.001	9.099
1/21/2018	11:59:00 PM	194700.001	9.098
1/22/2018	12:04:00 AM	195000.001	9.097
1/22/2018	12:09:00 AM	195300.001	9.096
1/22/2018	12:14:00 AM	195600.001	9.096
1/22/2018	12:19:00 AM	195900.001	9.099
1/22/2018	12:24:00 AM	196200.001	9.101
1/22/2018	12:29:00 AM	196500.001	9.099
1/22/2018	12:34:00 AM	196800.001	9.098
1/22/2018	12:39:00 AM	197100.001	9.1
1/22/2018	12:44:00 AM	197400.001	9.097
1/22/2018	12:49:00 AM	197700.001	9.098
1/22/2018	12:54:00 AM	198000.001	9.095
1/22/2018	12:59:00 AM	198300.001	9.101
1/22/2018	1:04:00 AM	198600.001	9.099
1/22/2018	1:09:00 AM	198900.001	9.097
1/22/2018	1:14:00 AM	199200.001	9.096
1/22/2018	1:19:00 AM	199500.001	9.095
1/22/2018	1:24:00 AM	199800.001	9.096
1/22/2018	1:29:00 AM	200100.001	9.094
1/22/2018	1:34:00 AM	200400.001	9.094
1/22/2018	1:39:00 AM	200700.001	9.088
1/22/2018	1:44:00 AM	201000.001	9.097

17WW02 Ambient.txt

1/22/2018	1:49:00 AM	201300.001	9.1
1/22/2018	1:54:00 AM	201600.001	9.092
1/22/2018	1:59:00 AM	201900.001	9.088
1/22/2018	2:04:00 AM	202200.001	9.093
1/22/2018	2:09:00 AM	202500.001	9.091
1/22/2018	2:14:00 AM	202800.001	9.091
1/22/2018	2:19:00 AM	203100.001	9.093
1/22/2018	2:24:00 AM	203400.001	9.089
1/22/2018	2:29:00 AM	203700.001	9.09
1/22/2018	2:34:00 AM	204000.001	9.09
1/22/2018	2:39:00 AM	204300.001	9.091
1/22/2018	2:44:00 AM	204600.001	9.088
1/22/2018	2:49:00 AM	204900.001	9.088
1/22/2018	2:54:00 AM	205200.001	9.088
1/22/2018	2:59:00 AM	205500.001	9.084
1/22/2018	3:04:00 AM	205800.001	9.089
1/22/2018	3:09:00 AM	206100.001	9.089
1/22/2018	3:14:00 AM	206400.001	9.083
1/22/2018	3:19:00 AM	206700.001	9.086
1/22/2018	3:24:00 AM	207000.001	9.086
1/22/2018	3:29:00 AM	207300.001	9.088
1/22/2018	3:34:00 AM	207600.001	9.083
1/22/2018	3:39:00 AM	207900.001	9.085
1/22/2018	3:44:00 AM	208200.001	9.086
1/22/2018	3:49:00 AM	208500.001	9.087
1/22/2018	3:54:00 AM	208800.001	9.086
1/22/2018	3:59:00 AM	209100.001	9.085
1/22/2018	4:04:00 AM	209400.001	9.086
1/22/2018	4:09:00 AM	209700.001	9.076
1/22/2018	4:14:00 AM	210000.001	9.082
1/22/2018	4:19:00 AM	210300.001	9.081
1/22/2018	4:24:00 AM	210600.001	9.081
1/22/2018	4:29:00 AM	210900.001	9.083
1/22/2018	4:34:00 AM	211200.001	9.082
1/22/2018	4:39:00 AM	211500.001	9.081
1/22/2018	4:44:00 AM	211800.001	9.082
1/22/2018	4:49:00 AM	212100.001	9.077
1/22/2018	4:54:00 AM	212400.001	9.08
1/22/2018	4:59:00 AM	212700.001	9.078
1/22/2018	5:04:00 AM	213000.001	9.077
1/22/2018	5:09:00 AM	213300.001	9.076
1/22/2018	5:14:00 AM	213600.001	9.076
1/22/2018	5:19:00 AM	213900.001	9.077
1/22/2018	5:24:00 AM	214200.001	9.073
1/22/2018	5:29:00 AM	214500.001	9.076
1/22/2018	5:34:00 AM	214800.001	9.077
1/22/2018	5:39:00 AM	215100.001	9.071
1/22/2018	5:44:00 AM	215400.001	9.071

17WW02 Ambient.txt

1/22/2018	5:49:00 AM	215700.001	9.071
1/22/2018	5:54:00 AM	216000.001	9.069
1/22/2018	5:59:00 AM	216300.001	9.064
1/22/2018	6:04:00 AM	216600.001	9.066
1/22/2018	6:09:00 AM	216900.001	9.067
1/22/2018	6:14:00 AM	217200.001	9.064
1/22/2018	6:19:00 AM	217500.001	9.067
1/22/2018	6:24:00 AM	217800.001	9.063
1/22/2018	6:29:00 AM	218100.001	9.059
1/22/2018	6:34:00 AM	218400.001	9.066
1/22/2018	6:39:00 AM	218700.001	9.061
1/22/2018	6:44:00 AM	219000.001	9.061
1/22/2018	6:49:00 AM	219300.001	9.058
1/22/2018	6:54:00 AM	219600.001	9.058
1/22/2018	6:59:00 AM	219900.001	9.058
1/22/2018	7:04:00 AM	220200.001	9.056
1/22/2018	7:09:00 AM	220500.001	9.056
1/22/2018	7:14:00 AM	220800.001	9.054
1/22/2018	7:19:00 AM	221100.001	9.053
1/22/2018	7:24:00 AM	221400.001	9.05
1/22/2018	7:29:00 AM	221700.001	9.049
1/22/2018	7:34:00 AM	222000.001	9.054
1/22/2018	7:39:00 AM	222300.001	9.052
1/22/2018	7:44:00 AM	222600.001	9.049
1/22/2018	7:49:00 AM	222900.001	9.051
1/22/2018	7:54:00 AM	223200.001	9.05
1/22/2018	7:59:00 AM	223500.001	9.051
1/22/2018	8:04:00 AM	223800.001	9.043
1/22/2018	8:09:00 AM	224100.001	9.044
1/22/2018	8:14:00 AM	224400.001	9.039
1/22/2018	8:19:00 AM	224700.001	9.046
1/22/2018	8:24:00 AM	225000.001	9.045
1/22/2018	8:29:00 AM	225300.001	9.04
1/22/2018	8:34:00 AM	225600.001	9.04
1/22/2018	8:39:00 AM	225900.001	9.036
1/22/2018	8:44:00 AM	226200.001	9.037
1/22/2018	8:49:00 AM	226500.001	9.036
1/22/2018	8:54:00 AM	226800.001	9.042
1/22/2018	8:59:00 AM	227100.001	9.03
1/22/2018	9:04:00 AM	227400.001	9.036
1/22/2018	9:09:00 AM	227700.001	9.035
1/22/2018	9:14:00 AM	228000.001	9.031
1/22/2018	9:19:00 AM	228300.001	9.031
1/22/2018	9:24:00 AM	228600.001	9.03
1/22/2018	9:29:00 AM	228900.001	9.03
1/22/2018	9:34:00 AM	229200.001	9.035
1/22/2018	9:39:00 AM	229500.001	9.027
1/22/2018	9:44:00 AM	229800.001	9.037

17WW02 Ambient.txt			
1/22/2018	9:49:00 AM	230100.001	9.023
1/22/2018	9:54:00 AM	230400.001	9.026
1/22/2018	9:59:00 AM	230700.001	9.022
1/22/2018	10:04:00 AM	231000.001	9.027
1/22/2018	10:09:00 AM	231300.001	9.022
1/22/2018	10:14:00 AM	231600.001	9.025
1/22/2018	10:19:00 AM	231900.001	9.026
1/22/2018	10:24:00 AM	232200.001	9.02
1/22/2018	10:29:00 AM	232500.001	9.03
1/22/2018	10:34:00 AM	232800.001	9.055
1/22/2018	10:39:00 AM	233100.001	9.057
1/22/2018	10:44:00 AM	233400.001	9.07

Date	Time	Seconds	17WW06 Ambient.txt Depth (ft)	
1/19/2018	6:13:05 PM	0	11.482	
1/19/2018	6:18:05 PM	300	11.484	
1/19/2018	6:23:05 PM	600	11.473	
1/19/2018	6:28:05 PM	900	11.477	
1/19/2018	6:33:05 PM	1200	11.474	
1/19/2018	6:38:05 PM	1500	11.479	
1/19/2018	6:43:05 PM	1800	11.468	
1/19/2018	6:48:05 PM	2100	11.47	
1/19/2018	6:53:05 PM	2400	11.466	
1/19/2018	6:58:05 PM	2700	11.469	
1/19/2018	7:03:05 PM	3000	11.472	
1/19/2018	7:08:05 PM	3300	11.474	
1/19/2018	7:13:05 PM	3600	11.481	
1/19/2018	7:18:05 PM	3900	11.47	
1/19/2018	7:23:05 PM	4200	11.476	
1/19/2018	7:28:05 PM	4500	11.474	
1/19/2018	7:33:05 PM	4800	11.472	
1/19/2018	7:38:05 PM	5100	11.473	
1/19/2018	7:43:05 PM	5400	11.473	
1/19/2018	7:48:05 PM	5700	11.471	
1/19/2018	7:53:05 PM	6000	11.466	
1/19/2018	7:58:05 PM	6300	11.474	
1/19/2018	8:03:05 PM	6600	11.472	
1/19/2018	8:08:05 PM	6900	11.475	
1/19/2018	8:13:05 PM	7200	11.475	
1/19/2018	8:18:05 PM	7500	11.472	
1/19/2018	8:23:05 PM	7800	11.475	
1/19/2018	8:28:05 PM	8100	11.477	
1/19/2018	8:33:05 PM	8400	11.47	
1/19/2018	8:38:05 PM	8700	11.473	
1/19/2018	8:43:05 PM	9000	11.475	
1/19/2018	8:48:05 PM	9300	11.476	
1/19/2018	8:53:05 PM	9600	11.471	
1/19/2018	8:58:05 PM	9900	11.49	
1/19/2018	9:03:05 PM	10200	11.491	
1/19/2018	9:08:05 PM	10500	11.487	
1/19/2018	9:13:05 PM	10800	11.494	
1/19/2018	9:18:05 PM	11100	11.494	
1/19/2018	9:23:05 PM	11400	11.493	
1/19/2018	9:28:05 PM	11700	11.491	
1/19/2018	9:33:05 PM	12000	11.486	
1/19/2018	9:38:05 PM	12300	11.486	
1/19/2018	9:43:05 PM	12600	11.49	
1/19/2018	9:48:05 PM	12900	11.491	
1/19/2018	9:53:05 PM	13200	11.487	
1/19/2018	9:58:05 PM	13500	11.485	
1/19/2018	10:03:05 PM	13800	11.501	

17WW06 Ambient.txt

1/19/2018	10:08:05 PM	14100	11.5
1/19/2018	10:13:05 PM	14400	11.5
1/19/2018	10:18:05 PM	14700	11.5
1/19/2018	10:23:05 PM	15000	11.498
1/19/2018	10:28:05 PM	15300	11.495
1/19/2018	10:33:05 PM	15600	11.5
1/19/2018	10:38:05 PM	15900	11.5
1/19/2018	10:43:05 PM	16200	11.499
1/19/2018	10:48:05 PM	16500	11.503
1/19/2018	10:53:05 PM	16800	11.505
1/19/2018	10:58:05 PM	17100	11.501
1/19/2018	11:03:05 PM	17400	11.503
1/19/2018	11:08:05 PM	17700	11.501
1/19/2018	11:13:05 PM	18000	11.498
1/19/2018	11:18:05 PM	18300	11.501
1/19/2018	11:23:05 PM	18600	11.502
1/19/2018	11:28:05 PM	18900	11.499
1/19/2018	11:33:05 PM	19200	11.503
1/19/2018	11:38:05 PM	19500	11.503
1/19/2018	11:43:05 PM	19800	11.512
1/19/2018	11:48:05 PM	20100	11.519
1/19/2018	11:53:05 PM	20400	11.517
1/19/2018	11:58:05 PM	20700	11.515
1/20/2018	12:03:05 AM	21000	11.516
1/20/2018	12:08:05 AM	21300	11.517
1/20/2018	12:13:05 AM	21600	11.511
1/20/2018	12:18:05 AM	21900	11.516
1/20/2018	12:23:05 AM	22200	11.511
1/20/2018	12:28:05 AM	22500	11.514
1/20/2018	12:33:05 AM	22800	11.513
1/20/2018	12:38:05 AM	23100	11.521
1/20/2018	12:43:05 AM	23400	11.51
1/20/2018	12:48:05 AM	23700	11.514
1/20/2018	12:53:05 AM	24000	11.511
1/20/2018	12:58:05 AM	24300	11.516
1/20/2018	1:03:05 AM	24600	11.52
1/20/2018	1:08:05 AM	24900	11.526
1/20/2018	1:13:05 AM	25200	11.527
1/20/2018	1:18:05 AM	25500	11.524
1/20/2018	1:23:05 AM	25800	11.524
1/20/2018	1:28:05 AM	26100	11.529
1/20/2018	1:33:05 AM	26400	11.523
1/20/2018	1:38:05 AM	26700	11.526
1/20/2018	1:43:05 AM	27000	11.528
1/20/2018	1:48:05 AM	27300	11.528
1/20/2018	1:53:05 AM	27600	11.529
1/20/2018	1:58:05 AM	27900	11.531
1/20/2018	2:03:05 AM	28200	11.527

17WW06 Ambient.txt

1/20/2018	2:08:05 AM	28500	11.527
1/20/2018	2:13:05 AM	28800	11.532
1/20/2018	2:18:05 AM	29100	11.533
1/20/2018	2:23:05 AM	29400	11.529
1/20/2018	2:28:05 AM	29700	11.528
1/20/2018	2:33:05 AM	30000	11.529
1/20/2018	2:38:05 AM	30300	11.537
1/20/2018	2:43:05 AM	30600	11.536
1/20/2018	2:48:05 AM	30900	11.538
1/20/2018	2:53:05 AM	31200	11.541
1/20/2018	2:58:05 AM	31500	11.54
1/20/2018	3:03:05 AM	31800	11.54
1/20/2018	3:08:05 AM	32100	11.541
1/20/2018	3:13:05 AM	32400	11.537
1/20/2018	3:18:05 AM	32700	11.54
1/20/2018	3:23:05 AM	33000	11.536
1/20/2018	3:28:05 AM	33300	11.539
1/20/2018	3:33:05 AM	33600	11.537
1/20/2018	3:38:05 AM	33900	11.537
1/20/2018	3:43:05 AM	34200	11.536
1/20/2018	3:48:05 AM	34500	11.535
1/20/2018	3:53:05 AM	34800	11.54
1/20/2018	3:58:05 AM	35100	11.541
1/20/2018	4:03:05 AM	35400	11.539
1/20/2018	4:08:05 AM	35700	11.547
1/20/2018	4:13:05 AM	36000	11.541
1/20/2018	4:18:05 AM	36300	11.547
1/20/2018	4:23:05 AM	36600	11.544
1/20/2018	4:28:05 AM	36900	11.551
1/20/2018	4:33:05 AM	37200	11.548
1/20/2018	4:38:05 AM	37500	11.548
1/20/2018	4:43:05 AM	37800	11.548
1/20/2018	4:48:05 AM	38100	11.55
1/20/2018	4:53:05 AM	38400	11.546
1/20/2018	4:58:05 AM	38700	11.547
1/20/2018	5:03:05 AM	39000	11.55
1/20/2018	5:08:05 AM	39300	11.55
1/20/2018	5:13:05 AM	39600	11.544
1/20/2018	5:18:05 AM	39900	11.549
1/20/2018	5:23:05 AM	40200	11.55
1/20/2018	5:28:05 AM	40500	11.546
1/20/2018	5:33:05 AM	40800	11.546
1/20/2018	5:38:05 AM	41100	11.545
1/20/2018	5:43:05 AM	41400	11.543
1/20/2018	5:48:05 AM	41700	11.552
1/20/2018	5:53:05 AM	42000	11.55
1/20/2018	5:58:05 AM	42300	11.546
1/20/2018	6:03:05 AM	42600	11.548

17WW06 Ambient.txt

1/20/2018	6:08:05 AM	42900	11.544
1/20/2018	6:13:05 AM	43200	11.542
1/20/2018	6:18:05 AM	43500	11.545
1/20/2018	6:23:05 AM	43800	11.546
1/20/2018	6:28:05 AM	44100	11.542
1/20/2018	6:33:05 AM	44400	11.545
1/20/2018	6:38:05 AM	44700	11.54
1/20/2018	6:43:05 AM	45000	11.544
1/20/2018	6:48:05 AM	45300	11.544
1/20/2018	6:53:05 AM	45600	11.544
1/20/2018	6:58:05 AM	45900	11.54
1/20/2018	7:03:05 AM	46200	11.54
1/20/2018	7:08:05 AM	46500	11.549
1/20/2018	7:13:05 AM	46800	11.537
1/20/2018	7:18:05 AM	47100	11.543
1/20/2018	7:23:05 AM	47400	11.549
1/20/2018	7:28:05 AM	47700	11.547
1/20/2018	7:33:05 AM	48000	11.546
1/20/2018	7:38:05 AM	48300	11.545
1/20/2018	7:43:05 AM	48600	11.55
1/20/2018	7:48:05 AM	48900	11.548
1/20/2018	7:53:05 AM	49200	11.546
1/20/2018	7:58:05 AM	49500	11.544
1/20/2018	8:03:05 AM	49800	11.543
1/20/2018	8:08:05 AM	50100	11.541
1/20/2018	8:13:05 AM	50400	11.549
1/20/2018	8:18:05 AM	50700	11.547
1/20/2018	8:23:05 AM	51000	11.542
1/20/2018	8:28:05 AM	51300	11.542
1/20/2018	8:33:05 AM	51600	11.538
1/20/2018	8:38:05 AM	51900	11.544
1/20/2018	8:43:05 AM	52200	11.543
1/20/2018	8:48:05 AM	52500	11.54
1/20/2018	8:53:05 AM	52800	11.545
1/20/2018	8:58:05 AM	53100	11.538
1/20/2018	9:03:05 AM	53400	11.543
1/20/2018	9:08:05 AM	53700	11.54
1/20/2018	9:13:05 AM	54000	11.54
1/20/2018	9:18:05 AM	54300	11.537
1/20/2018	9:23:05 AM	54600	11.545
1/20/2018	9:28:05 AM	54900	11.546
1/20/2018	9:33:05 AM	55200	11.553
1/20/2018	9:38:05 AM	55500	11.543
1/20/2018	9:43:05 AM	55800	11.55
1/20/2018	9:48:05 AM	56100	11.548
1/20/2018	9:53:05 AM	56400	11.546
1/20/2018	9:58:05 AM	56700	11.543
1/20/2018	10:03:05 AM	57000	11.547

17WW06 Ambient.txt

1/20/2018	10:08:05 AM	57300	11.543
1/20/2018	10:13:05 AM	57600	11.539
1/20/2018	10:18:05 AM	57900	11.536
1/20/2018	10:23:05 AM	58200	11.542
1/20/2018	10:28:05 AM	58500	11.542
1/20/2018	10:33:05 AM	58800	11.539
1/20/2018	10:38:05 AM	59100	11.533
1/20/2018	10:43:05 AM	59400	11.546
1/20/2018	10:48:05 AM	59700	11.542
1/20/2018	10:53:05 AM	60000	11.543
1/20/2018	10:58:05 AM	60300	11.546
1/20/2018	11:03:05 AM	60600	11.579
1/20/2018	11:08:05 AM	60900	11.582
1/20/2018	11:13:05 AM	61200	11.576
1/20/2018	11:18:05 AM	61500	11.585
1/20/2018	11:23:05 AM	61800	11.583
1/20/2018	11:28:05 AM	62100	11.573
1/20/2018	11:33:05 AM	62400	11.577
1/20/2018	11:38:05 AM	62700	11.589
1/20/2018	11:43:05 AM	63000	11.581
1/20/2018	11:48:05 AM	63300	11.584
1/20/2018	11:53:05 AM	63600	11.589
1/20/2018	11:58:05 AM	63900	11.588
1/20/2018	12:03:05 PM	64200	11.606
1/20/2018	12:08:05 PM	64500	11.602
1/20/2018	12:13:05 PM	64800	11.592
1/20/2018	12:18:05 PM	65100	11.6
1/20/2018	12:23:05 PM	65400	11.597
1/20/2018	12:28:05 PM	65700	11.601
1/20/2018	12:33:05 PM	66000	11.6
1/20/2018	12:38:05 PM	66300	11.606
1/20/2018	12:43:05 PM	66600	11.603
1/20/2018	12:48:05 PM	66900	11.611
1/20/2018	12:53:05 PM	67200	11.611
1/20/2018	12:58:05 PM	67500	11.605
1/20/2018	1:03:05 PM	67800	11.613
1/20/2018	1:08:05 PM	68100	11.613
1/20/2018	1:13:05 PM	68400	11.614
1/20/2018	1:18:05 PM	68700	11.613
1/20/2018	1:23:05 PM	69000	11.617
1/20/2018	1:28:05 PM	69300	11.622
1/20/2018	1:33:05 PM	69600	11.622
1/20/2018	1:38:05 PM	69900	11.618
1/20/2018	1:43:05 PM	70200	11.615
1/20/2018	1:48:05 PM	70500	11.619
1/20/2018	1:53:05 PM	70800	11.616
1/20/2018	1:58:05 PM	71100	11.618
1/20/2018	2:03:05 PM	71400	11.621

17WW06 Ambient.txt

1/20/2018	2:08:05 PM	71700	11.62
1/20/2018	2:13:05 PM	72000	11.625
1/20/2018	2:18:05 PM	72300	11.614
1/20/2018	2:23:05 PM	72600	11.624
1/20/2018	2:28:05 PM	72900	11.619
1/20/2018	2:33:05 PM	73200	11.622
1/20/2018	2:38:05 PM	73500	11.622
1/20/2018	2:43:05 PM	73800	11.623
1/20/2018	2:48:05 PM	74100	11.621
1/20/2018	2:53:05 PM	74400	11.625
1/20/2018	2:58:05 PM	74700	11.62
1/20/2018	3:03:05 PM	75000	11.62
1/20/2018	3:08:05 PM	75300	11.621
1/20/2018	3:13:05 PM	75600	11.621
1/20/2018	3:18:05 PM	75900	11.623
1/20/2018	3:23:05 PM	76200	11.625
1/20/2018	3:28:05 PM	76500	11.63
1/20/2018	3:33:05 PM	76800	11.627
1/20/2018	3:38:05 PM	77100	11.632
1/20/2018	3:43:05 PM	77400	11.629
1/20/2018	3:48:05 PM	77700	11.636
1/20/2018	3:53:05 PM	78000	11.627
1/20/2018	3:58:05 PM	78300	11.633
1/20/2018	4:03:05 PM	78600	11.626
1/20/2018	4:08:05 PM	78900	11.632
1/20/2018	4:13:05 PM	79200	11.626
1/20/2018	4:18:05 PM	79500	11.619
1/20/2018	4:23:05 PM	79800	11.632
1/20/2018	4:28:05 PM	80100	11.632
1/20/2018	4:33:05 PM	80400	11.63
1/20/2018	4:38:05 PM	80700	11.613
1/20/2018	4:43:05 PM	81000	11.631
1/20/2018	4:48:05 PM	81300	11.628
1/20/2018	4:53:05 PM	81600	11.619
1/20/2018	4:58:05 PM	81900	11.633
1/20/2018	5:03:05 PM	82200	11.631
1/20/2018	5:08:05 PM	82500	11.629
1/20/2018	5:13:05 PM	82800	11.627
1/20/2018	5:18:05 PM	83100	11.624
1/20/2018	5:23:05 PM	83400	11.624
1/20/2018	5:28:05 PM	83700	11.616
1/20/2018	5:33:05 PM	84000	11.621
1/20/2018	5:38:05 PM	84300	11.624
1/20/2018	5:43:05 PM	84600	11.62
1/20/2018	5:48:05 PM	84900	11.613
1/20/2018	5:53:05 PM	85200	11.618
1/20/2018	5:58:05 PM	85500	11.619
1/20/2018	6:03:05 PM	85800	11.616

17WW06 Ambient.txt

1/20/2018	6:08:05 PM	86100	11.62
1/20/2018	6:13:05 PM	86400	11.619
1/20/2018	6:18:05 PM	86700	11.613
1/20/2018	6:23:05 PM	87000	11.611
1/20/2018	6:28:05 PM	87300	11.611
1/20/2018	6:33:05 PM	87600	11.613
1/20/2018	6:38:05 PM	87900	11.602
1/20/2018	6:43:05 PM	88200	11.608
1/20/2018	6:48:05 PM	88500	11.611
1/20/2018	6:53:05 PM	88800	11.602
1/20/2018	6:58:05 PM	89100	11.609
1/20/2018	7:03:05 PM	89400	11.605
1/20/2018	7:08:05 PM	89700	11.61
1/20/2018	7:13:05 PM	90000	11.618
1/20/2018	7:18:05 PM	90300	11.623
1/20/2018	7:23:05 PM	90600	11.623
1/20/2018	7:28:05 PM	90900	11.619
1/20/2018	7:33:05 PM	91200	11.615
1/20/2018	7:38:05 PM	91500	11.615
1/20/2018	7:43:05 PM	91800	11.622
1/20/2018	7:48:05 PM	92100	11.623
1/20/2018	7:53:05 PM	92400	11.622
1/20/2018	7:58:05 PM	92700	11.62
1/20/2018	8:03:05 PM	93000	11.62
1/20/2018	8:08:05 PM	93300	11.62
1/20/2018	8:13:05 PM	93600	11.615
1/20/2018	8:18:05 PM	93900	11.618
1/20/2018	8:23:05 PM	94200	11.619
1/20/2018	8:28:05 PM	94500	11.619
1/20/2018	8:33:05 PM	94800	11.617
1/20/2018	8:38:05 PM	95100	11.624
1/20/2018	8:43:05 PM	95400	11.622
1/20/2018	8:48:05 PM	95700	11.621
1/20/2018	8:53:05 PM	96000	11.627
1/20/2018	8:58:05 PM	96300	11.621
1/20/2018	9:03:05 PM	96600	11.627
1/20/2018	9:08:05 PM	96900	11.619
1/20/2018	9:13:05 PM	97200	11.624
1/20/2018	9:18:05 PM	97500	11.628
1/20/2018	9:23:05 PM	97800	11.625
1/20/2018	9:28:05 PM	98100	11.625
1/20/2018	9:33:05 PM	98400	11.627
1/20/2018	9:38:05 PM	98700	11.629
1/20/2018	9:43:05 PM	99000	11.631
1/20/2018	9:48:05 PM	99300	11.628
1/20/2018	9:53:05 PM	99600	11.628
1/20/2018	9:58:05 PM	99900	11.631
1/20/2018	10:03:05 PM	100200	11.629

17WW06 Ambient.txt

1/20/2018	10:08:05 PM	100500	11.634
1/20/2018	10:13:05 PM	100800	11.634
1/20/2018	10:18:05 PM	101100	11.635
1/20/2018	10:23:05 PM	101400	11.627
1/20/2018	10:28:05 PM	101700	11.631
1/20/2018	10:33:05 PM	102000	11.63
1/20/2018	10:38:05 PM	102300	11.631
1/20/2018	10:43:05 PM	102600	11.627
1/20/2018	10:48:05 PM	102900	11.628
1/20/2018	10:53:05 PM	103200	11.632
1/20/2018	10:58:05 PM	103500	11.629
1/20/2018	11:03:05 PM	103800	11.626
1/20/2018	11:08:05 PM	104100	11.631
1/20/2018	11:13:05 PM	104400	11.629
1/20/2018	11:18:05 PM	104700	11.633
1/20/2018	11:23:05 PM	105000	11.628
1/20/2018	11:28:05 PM	105300	11.629
1/20/2018	11:33:05 PM	105600	11.628
1/20/2018	11:38:05 PM	105900	11.628
1/20/2018	11:43:05 PM	106200	11.628
1/20/2018	11:48:05 PM	106500	11.626
1/20/2018	11:53:05 PM	106800	11.628
1/20/2018	11:58:05 PM	107100	11.63
1/21/2018	12:03:05 AM	107400	11.631
1/21/2018	12:08:05 AM	107700	11.627
1/21/2018	12:13:05 AM	108000	11.628
1/21/2018	12:18:05 AM	108300	11.629
1/21/2018	12:23:05 AM	108600	11.636
1/21/2018	12:28:05 AM	108900	11.632
1/21/2018	12:33:05 AM	109200	11.627
1/21/2018	12:38:05 AM	109500	11.626
1/21/2018	12:43:05 AM	109800	11.626
1/21/2018	12:48:05 AM	110100	11.629
1/21/2018	12:53:05 AM	110400	11.629
1/21/2018	12:58:05 AM	110700	11.625
1/21/2018	1:03:05 AM	111000	11.628
1/21/2018	1:08:05 AM	111300	11.629
1/21/2018	1:13:05 AM	111600	11.632
1/21/2018	1:18:05 AM	111900	11.632
1/21/2018	1:23:05 AM	112200	11.634
1/21/2018	1:28:05 AM	112500	11.635
1/21/2018	1:33:05 AM	112800	11.638
1/21/2018	1:38:05 AM	113100	11.633
1/21/2018	1:43:05 AM	113400	11.631
1/21/2018	1:48:05 AM	113700	11.632
1/21/2018	1:53:05 AM	114000	11.637
1/21/2018	1:58:05 AM	114300	11.633
1/21/2018	2:03:05 AM	114600	11.636

17WW06 Ambient.txt

1/21/2018	2:08:05 AM	114900	11.636
1/21/2018	2:13:05 AM	115200	11.635
1/21/2018	2:18:05 AM	115500	11.636
1/21/2018	2:23:05 AM	115800	11.634
1/21/2018	2:28:05 AM	116100	11.638
1/21/2018	2:33:05 AM	116400	11.638
1/21/2018	2:38:05 AM	116700	11.637
1/21/2018	2:43:05 AM	117000	11.642
1/21/2018	2:48:05 AM	117300	11.638
1/21/2018	2:53:05 AM	117600	11.639
1/21/2018	2:58:05 AM	117900	11.64
1/21/2018	3:03:05 AM	118200	11.644
1/21/2018	3:08:05 AM	118500	11.642
1/21/2018	3:13:05 AM	118800	11.644
1/21/2018	3:18:05 AM	119100	11.64
1/21/2018	3:23:05 AM	119400	11.64
1/21/2018	3:28:05 AM	119700	11.641
1/21/2018	3:33:05 AM	120000	11.639
1/21/2018	3:38:05 AM	120300	11.639
1/21/2018	3:43:05 AM	120600	11.643
1/21/2018	3:48:05 AM	120900	11.642
1/21/2018	3:53:05 AM	121200	11.646
1/21/2018	3:58:05 AM	121500	11.646
1/21/2018	4:03:05 AM	121800	11.642
1/21/2018	4:08:05 AM	122100	11.647
1/21/2018	4:13:05 AM	122400	11.65
1/21/2018	4:18:05 AM	122700	11.645
1/21/2018	4:23:05 AM	123000	11.648
1/21/2018	4:28:05 AM	123300	11.644
1/21/2018	4:33:05 AM	123600	11.644
1/21/2018	4:38:05 AM	123900	11.639
1/21/2018	4:43:05 AM	124200	11.638
1/21/2018	4:48:05 AM	124500	11.638
1/21/2018	4:53:05 AM	124800	11.64
1/21/2018	4:58:05 AM	125100	11.642
1/21/2018	5:03:05 AM	125400	11.643
1/21/2018	5:08:05 AM	125700	11.641
1/21/2018	5:13:05 AM	126000	11.639
1/21/2018	5:18:05 AM	126300	11.642
1/21/2018	5:23:05 AM	126600	11.639
1/21/2018	5:28:05 AM	126900	11.639
1/21/2018	5:33:05 AM	127200	11.641
1/21/2018	5:38:05 AM	127500	11.643
1/21/2018	5:43:05 AM	127800	11.638
1/21/2018	5:48:05 AM	128100	11.64
1/21/2018	5:53:05 AM	128400	11.639
1/21/2018	5:58:05 AM	128700	11.642
1/21/2018	6:03:05 AM	129000	11.642

17WW06 Ambient.txt

1/21/2018	6:08:05 AM	129300	11.639
1/21/2018	6:13:05 AM	129600	11.645
1/21/2018	6:18:05 AM	129900	11.64
1/21/2018	6:23:05 AM	130200	11.643
1/21/2018	6:28:05 AM	130500	11.642
1/21/2018	6:33:05 AM	130800	11.637
1/21/2018	6:38:05 AM	131100	11.64
1/21/2018	6:43:05 AM	131400	11.641
1/21/2018	6:48:05 AM	131700	11.637
1/21/2018	6:53:05 AM	132000	11.644
1/21/2018	6:58:05 AM	132300	11.639
1/21/2018	7:03:05 AM	132600	11.637
1/21/2018	7:08:05 AM	132900	11.639
1/21/2018	7:13:05 AM	133200	11.637
1/21/2018	7:18:05 AM	133500	11.637
1/21/2018	7:23:05 AM	133800	11.638
1/21/2018	7:28:05 AM	134100	11.63
1/21/2018	7:33:05 AM	134400	11.638
1/21/2018	7:38:05 AM	134700	11.635
1/21/2018	7:43:05 AM	135000	11.641
1/21/2018	7:48:05 AM	135300	11.634
1/21/2018	7:53:05 AM	135600	11.634
1/21/2018	7:58:05 AM	135900	11.634
1/21/2018	8:03:05 AM	136200	11.635
1/21/2018	8:08:05 AM	136500	11.644
1/21/2018	8:13:05 AM	136800	11.643
1/21/2018	8:18:05 AM	137100	11.643
1/21/2018	8:23:05 AM	137400	11.646
1/21/2018	8:28:05 AM	137700	11.647
1/21/2018	8:33:05 AM	138000	11.645
1/21/2018	8:38:05 AM	138300	11.645
1/21/2018	8:43:05 AM	138600	11.642
1/21/2018	8:48:05 AM	138900	11.641
1/21/2018	8:53:05 AM	139200	11.644
1/21/2018	8:58:05 AM	139500	11.644
1/21/2018	9:03:05 AM	139800	11.645
1/21/2018	9:08:05 AM	140100	11.644
1/21/2018	9:13:05 AM	140400	11.635
1/21/2018	9:18:05 AM	140700	11.634
1/21/2018	9:23:05 AM	141000	11.636
1/21/2018	9:28:05 AM	141300	11.635
1/21/2018	9:33:05 AM	141600	11.634
1/21/2018	9:38:05 AM	141900	11.632
1/21/2018	9:43:05 AM	142200	11.631
1/21/2018	9:48:05 AM	142500	11.635
1/21/2018	9:53:05 AM	142800	11.629
1/21/2018	9:58:05 AM	143100	11.63
1/21/2018	10:03:05 AM	143400	11.628

17WW06 Ambient.txt

1/21/2018	10:08:05 AM	143700	11.626
1/21/2018	10:13:05 AM	144000	11.628
1/21/2018	10:18:05 AM	144300	11.627
1/21/2018	10:23:05 AM	144600	11.63
1/21/2018	10:28:05 AM	144900	11.629
1/21/2018	10:33:05 AM	145200	11.627
1/21/2018	10:38:05 AM	145500	11.628
1/21/2018	10:43:05 AM	145800	11.628
1/21/2018	10:48:05 AM	146100	11.634
1/21/2018	10:53:05 AM	146400	11.631
1/21/2018	10:58:05 AM	146700	11.636
1/21/2018	11:03:05 AM	147000	11.631
1/21/2018	11:08:05 AM	147300	11.632
1/21/2018	11:13:05 AM	147600	11.648
1/21/2018	11:18:05 AM	147900	11.646
1/21/2018	11:23:05 AM	148200	11.63
1/21/2018	11:28:05 AM	148500	11.644
1/21/2018	11:33:05 AM	148800	11.656
1/21/2018	11:38:05 AM	149100	11.652
1/21/2018	11:43:05 AM	149400	11.655
1/21/2018	11:48:05 AM	149700	11.666
1/21/2018	11:53:05 AM	150000	11.665
1/21/2018	11:58:05 AM	150300	11.663
1/21/2018	12:03:05 PM	150600	11.664
1/21/2018	12:08:05 PM	150900	11.672
1/21/2018	12:13:05 PM	151200	11.668
1/21/2018	12:18:05 PM	151500	11.673
1/21/2018	12:23:05 PM	151800	11.669
1/21/2018	12:28:05 PM	152100	11.677
1/21/2018	12:33:05 PM	152400	11.668
1/21/2018	12:38:05 PM	152700	11.674
1/21/2018	12:43:05 PM	153000	11.676
1/21/2018	12:48:05 PM	153300	11.677
1/21/2018	12:53:05 PM	153600	11.68
1/21/2018	12:58:05 PM	153900	11.661
1/21/2018	1:03:05 PM	154200	11.694
1/21/2018	1:08:05 PM	154500	11.688
1/21/2018	1:13:05 PM	154800	11.688
1/21/2018	1:18:05 PM	155100	11.684
1/21/2018	1:23:05 PM	155400	11.693
1/21/2018	1:28:05 PM	155700	11.689
1/21/2018	1:33:05 PM	156000	11.692
1/21/2018	1:38:05 PM	156300	11.697
1/21/2018	1:43:05 PM	156600	11.682
1/21/2018	1:48:05 PM	156900	11.696
1/21/2018	1:53:05 PM	157200	11.698
1/21/2018	1:58:05 PM	157500	11.694
1/21/2018	2:03:05 PM	157800	11.688

17WW06 Ambient.txt

1/21/2018	2:08:05 PM	158100	11.703
1/21/2018	2:13:05 PM	158400	11.702
1/21/2018	2:18:05 PM	158700	11.704
1/21/2018	2:23:05 PM	159000	11.699
1/21/2018	2:28:05 PM	159300	11.701
1/21/2018	2:33:05 PM	159600	11.706
1/21/2018	2:38:05 PM	159900	11.712
1/21/2018	2:43:05 PM	160200	11.705
1/21/2018	2:48:05 PM	160500	11.706
1/21/2018	2:53:05 PM	160800	11.707
1/21/2018	2:58:05 PM	161100	11.697
1/21/2018	3:03:05 PM	161400	11.697
1/21/2018	3:08:05 PM	161700	11.706
1/21/2018	3:13:05 PM	162000	11.707
1/21/2018	3:18:05 PM	162300	11.693
1/21/2018	3:23:05 PM	162600	11.708
1/21/2018	3:28:05 PM	162900	11.71
1/21/2018	3:33:05 PM	163200	11.693
1/21/2018	3:38:05 PM	163500	11.701
1/21/2018	3:43:05 PM	163800	11.707
1/21/2018	3:48:05 PM	164100	11.698
1/21/2018	3:53:05 PM	164400	11.702
1/21/2018	3:58:05 PM	164700	11.708
1/21/2018	4:03:05 PM	165000	11.712
1/21/2018	4:08:05 PM	165300	11.705
1/21/2018	4:13:05 PM	165600	11.711
1/21/2018	4:18:05 PM	165900	11.703
1/21/2018	4:23:05 PM	166200	11.715
1/21/2018	4:28:05 PM	166500	11.702
1/21/2018	4:33:05 PM	166800	11.701
1/21/2018	4:38:05 PM	167100	11.712
1/21/2018	4:43:05 PM	167400	11.711
1/21/2018	4:48:05 PM	167700	11.709
1/21/2018	4:53:05 PM	168000	11.707
1/21/2018	4:58:05 PM	168300	11.704
1/21/2018	5:03:05 PM	168600	11.708
1/21/2018	5:08:05 PM	168900	11.707
1/21/2018	5:13:05 PM	169200	11.705
1/21/2018	5:18:05 PM	169500	11.708
1/21/2018	5:23:05 PM	169800	11.695
1/21/2018	5:28:05 PM	170100	11.698
1/21/2018	5:33:05 PM	170400	11.697
1/21/2018	5:38:05 PM	170700	11.701
1/21/2018	5:43:05 PM	171000	11.704
1/21/2018	5:48:05 PM	171300	11.699
1/21/2018	5:53:05 PM	171600	11.708
1/21/2018	5:58:05 PM	171900	11.707
1/21/2018	6:03:05 PM	172200	11.706

17WW06 Ambient.txt

1/21/2018	6:08:05 PM	172500	11.707
1/21/2018	6:13:05 PM	172800	11.704
1/21/2018	6:18:05 PM	173100	11.712
1/21/2018	6:23:05 PM	173400	11.709
1/21/2018	6:28:05 PM	173700	11.709
1/21/2018	6:33:05 PM	174000	11.708
1/21/2018	6:38:05 PM	174300	11.709
1/21/2018	6:43:05 PM	174600	11.71
1/21/2018	6:48:05 PM	174900	11.713
1/21/2018	6:53:05 PM	175200	11.709
1/21/2018	6:58:05 PM	175500	11.706
1/21/2018	7:03:05 PM	175800	11.706
1/21/2018	7:08:05 PM	176100	11.704
1/21/2018	7:13:05 PM	176400	11.708
1/21/2018	7:18:05 PM	176700	11.701
1/21/2018	7:23:05 PM	177000	11.713
1/21/2018	7:28:05 PM	177300	11.707
1/21/2018	7:33:05 PM	177600	11.708
1/21/2018	7:38:05 PM	177900	11.707
1/21/2018	7:43:05 PM	178200	11.707
1/21/2018	7:48:05 PM	178500	11.705
1/21/2018	7:53:05 PM	178800	11.706
1/21/2018	7:58:05 PM	179100	11.715
1/21/2018	8:03:05 PM	179400	11.709
1/21/2018	8:08:05 PM	179700	11.715
1/21/2018	8:13:05 PM	180000	11.72
1/21/2018	8:18:05 PM	180300	11.723
1/21/2018	8:23:05 PM	180600	11.715
1/21/2018	8:28:05 PM	180900	11.722
1/21/2018	8:33:05 PM	181200	11.716
1/21/2018	8:38:05 PM	181500	11.718
1/21/2018	8:43:05 PM	181800	11.716
1/21/2018	8:48:05 PM	182100	11.711
1/21/2018	8:53:05 PM	182400	11.711
1/21/2018	8:58:05 PM	182700	11.72
1/21/2018	9:03:05 PM	183000	11.712
1/21/2018	9:08:05 PM	183300	11.725
1/21/2018	9:13:05 PM	183600	11.727
1/21/2018	9:18:05 PM	183900	11.723
1/21/2018	9:23:05 PM	184200	11.729
1/21/2018	9:28:05 PM	184500	11.723
1/21/2018	9:33:05 PM	184800	11.721
1/21/2018	9:38:05 PM	185100	11.718
1/21/2018	9:43:05 PM	185400	11.715
1/21/2018	9:48:05 PM	185700	11.71
1/21/2018	9:53:05 PM	186000	11.712
1/21/2018	9:58:05 PM	186300	11.714
1/21/2018	10:03:05 PM	186600	11.71

17WW06 Ambient.txt

1/21/2018	10:08:05 PM	186900	11.71
1/21/2018	10:13:05 PM	187200	11.712
1/21/2018	10:18:05 PM	187500	11.714
1/21/2018	10:23:05 PM	187800	11.719
1/21/2018	10:28:05 PM	188100	11.715
1/21/2018	10:33:05 PM	188400	11.72
1/21/2018	10:38:05 PM	188700	11.717
1/21/2018	10:43:05 PM	189000	11.725
1/21/2018	10:48:05 PM	189300	11.72
1/21/2018	10:53:05 PM	189600	11.715
1/21/2018	10:58:05 PM	189900	11.719
1/21/2018	11:03:05 PM	190200	11.72
1/21/2018	11:08:05 PM	190500	11.718
1/21/2018	11:13:05 PM	190800	11.715
1/21/2018	11:18:05 PM	191100	11.718
1/21/2018	11:23:05 PM	191400	11.725
1/21/2018	11:28:05 PM	191700	11.717
1/21/2018	11:33:05 PM	192000	11.726
1/21/2018	11:38:05 PM	192300	11.729
1/21/2018	11:43:05 PM	192600	11.729
1/21/2018	11:48:05 PM	192900	11.723
1/21/2018	11:53:05 PM	193200	11.718
1/21/2018	11:58:05 PM	193500	11.721
1/22/2018	12:03:05 AM	193800	11.722
1/22/2018	12:08:05 AM	194100	11.724
1/22/2018	12:13:05 AM	194400	11.719
1/22/2018	12:18:05 AM	194700	11.718
1/22/2018	12:23:05 AM	195000	11.722
1/22/2018	12:28:05 AM	195300	11.71
1/22/2018	12:33:05 AM	195600	11.709
1/22/2018	12:38:05 AM	195900	11.715
1/22/2018	12:43:05 AM	196200	11.705
1/22/2018	12:48:05 AM	196500	11.711
1/22/2018	12:53:05 AM	196800	11.709
1/22/2018	12:58:05 AM	197100	11.728
1/22/2018	1:03:05 AM	197400	11.723
1/22/2018	1:08:05 AM	197700	11.72
1/22/2018	1:13:05 AM	198000	11.722
1/22/2018	1:18:05 AM	198300	11.72
1/22/2018	1:23:05 AM	198600	11.718
1/22/2018	1:28:05 AM	198900	11.722
1/22/2018	1:33:05 AM	199200	11.71
1/22/2018	1:38:05 AM	199500	11.703
1/22/2018	1:43:05 AM	199800	11.71
1/22/2018	1:48:05 AM	200100	11.712
1/22/2018	1:53:05 AM	200400	11.711
1/22/2018	1:58:05 AM	200700	11.712
1/22/2018	2:03:05 AM	201000	11.716

17WW06 Ambient.txt

1/22/2018	2:08:05 AM	201300	11.708
1/22/2018	2:13:05 AM	201600	11.709
1/22/2018	2:18:05 AM	201900	11.708
1/22/2018	2:23:05 AM	202200	11.708
1/22/2018	2:28:05 AM	202500	11.712
1/22/2018	2:33:05 AM	202800	11.707
1/22/2018	2:38:05 AM	203100	11.708
1/22/2018	2:43:05 AM	203400	11.709
1/22/2018	2:48:05 AM	203700	11.706
1/22/2018	2:53:05 AM	204000	11.701
1/22/2018	2:58:05 AM	204300	11.704
1/22/2018	3:03:05 AM	204600	11.704
1/22/2018	3:08:05 AM	204900	11.705
1/22/2018	3:13:05 AM	205200	11.71
1/22/2018	3:18:05 AM	205500	11.705
1/22/2018	3:23:05 AM	205800	11.706
1/22/2018	3:28:05 AM	206100	11.707
1/22/2018	3:33:05 AM	206400	11.711
1/22/2018	3:38:05 AM	206700	11.71
1/22/2018	3:43:05 AM	207000	11.706
1/22/2018	3:48:05 AM	207300	11.703
1/22/2018	3:53:05 AM	207600	11.703
1/22/2018	3:58:05 AM	207900	11.701
1/22/2018	4:03:05 AM	208200	11.702
1/22/2018	4:08:05 AM	208500	11.696
1/22/2018	4:13:05 AM	208800	11.697
1/22/2018	4:18:05 AM	209100	11.699
1/22/2018	4:23:05 AM	209400	11.699
1/22/2018	4:28:05 AM	209700	11.701
1/22/2018	4:33:05 AM	210000	11.698
1/22/2018	4:38:05 AM	210300	11.697
1/22/2018	4:43:05 AM	210600	11.696
1/22/2018	4:48:05 AM	210900	11.697
1/22/2018	4:53:05 AM	211200	11.694
1/22/2018	4:58:05 AM	211500	11.696
1/22/2018	5:03:05 AM	211800	11.696
1/22/2018	5:08:05 AM	212100	11.69
1/22/2018	5:13:05 AM	212400	11.692
1/22/2018	5:18:05 AM	212700	11.689
1/22/2018	5:23:05 AM	213000	11.688
1/22/2018	5:28:05 AM	213300	11.691
1/22/2018	5:33:05 AM	213600	11.688
1/22/2018	5:38:05 AM	213900	11.684
1/22/2018	5:43:05 AM	214200	11.686
1/22/2018	5:48:05 AM	214500	11.681
1/22/2018	5:53:05 AM	214800	11.674
1/22/2018	5:58:05 AM	215100	11.675
1/22/2018	6:03:05 AM	215400	11.673

17WW06 Ambient.txt

1/22/2018	6:08:05 AM	215700	11.675
1/22/2018	6:13:05 AM	216000	11.672
1/22/2018	6:18:05 AM	216300	11.671
1/22/2018	6:23:05 AM	216600	11.67
1/22/2018	6:28:05 AM	216900	11.673
1/22/2018	6:33:05 AM	217200	11.673
1/22/2018	6:38:05 AM	217500	11.671
1/22/2018	6:43:05 AM	217800	11.669
1/22/2018	6:48:05 AM	218100	11.666
1/22/2018	6:53:05 AM	218400	11.668
1/22/2018	6:58:05 AM	218700	11.665
1/22/2018	7:03:05 AM	219000	11.667
1/22/2018	7:08:05 AM	219300	11.667
1/22/2018	7:13:05 AM	219600	11.663
1/22/2018	7:18:05 AM	219900	11.666
1/22/2018	7:23:05 AM	220200	11.666
1/22/2018	7:28:05 AM	220500	11.667
1/22/2018	7:33:05 AM	220800	11.665
1/22/2018	7:38:05 AM	221100	11.661
1/22/2018	7:43:05 AM	221400	11.661
1/22/2018	7:48:05 AM	221700	11.657
1/22/2018	7:53:05 AM	222000	11.657
1/22/2018	7:58:05 AM	222300	11.656
1/22/2018	8:03:05 AM	222600	11.653
1/22/2018	8:08:05 AM	222900	11.653
1/22/2018	8:13:05 AM	223200	11.648
1/22/2018	8:18:05 AM	223500	11.649
1/22/2018	8:23:05 AM	223800	11.648
1/22/2018	8:28:05 AM	224100	11.649
1/22/2018	8:33:05 AM	224400	11.647
1/22/2018	8:38:05 AM	224700	11.64
1/22/2018	8:43:05 AM	225000	11.642
1/22/2018	8:48:05 AM	225300	11.642
1/22/2018	8:53:05 AM	225600	11.643
1/22/2018	8:58:05 AM	225900	11.644
1/22/2018	9:03:05 AM	226200	11.638
1/22/2018	9:08:05 AM	226500	11.642
1/22/2018	9:13:05 AM	226800	11.632
1/22/2018	9:18:05 AM	227100	11.632
1/22/2018	9:23:05 AM	227400	11.635
1/22/2018	9:28:05 AM	227700	11.642
1/22/2018	9:33:05 AM	228000	11.641
1/22/2018	9:38:05 AM	228300	11.654
1/22/2018	9:43:05 AM	228600	11.65
1/22/2018	9:48:05 AM	228900	11.634
1/22/2018	9:53:05 AM	229200	11.634
1/22/2018	9:58:05 AM	229500	11.63
1/22/2018	10:03:05 AM	229800	11.632

17WW06 Ambient.txt			
1/22/2018	10:08:05 AM	230100	11.631
1/22/2018	10:13:05 AM	230400	11.636
1/22/2018	10:18:05 AM	230700	11.634
1/22/2018	10:23:05 AM	231000	11.636
1/22/2018	10:28:05 AM	231300	11.649
1/22/2018	10:33:05 AM	231600	11.64
1/22/2018	10:38:05 AM	231900	11.633
1/22/2018	10:43:05 AM	232200	11.65

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Date	Time	Seconds	Depth (ft)	
1/19/2018	6:24:40 PM	0	8.887	
1/19/2018	6:29:40 PM	300.001	8.881	
1/19/2018	6:34:40 PM	600.001	8.884	
1/19/2018	6:39:40 PM	900.001	8.876	
1/19/2018	6:44:40 PM	1200.001		8.87
1/19/2018	6:49:40 PM	1500.001		8.87
1/19/2018	6:54:40 PM	1800.001		8.868
1/19/2018	6:59:40 PM	2100.001		8.869
1/19/2018	7:04:40 PM	2400.001		8.86
1/19/2018	7:09:40 PM	2700.001		8.867
1/19/2018	7:14:40 PM	3000.001		8.869
1/19/2018	7:19:40 PM	3300.001		8.867
1/19/2018	7:24:40 PM	3600.001		8.865
1/19/2018	7:29:40 PM	3900.001		8.868
1/19/2018	7:34:40 PM	4200.001		8.861
1/19/2018	7:39:40 PM	4500.001		8.86
1/19/2018	7:44:40 PM	4800.001		8.856
1/19/2018	7:49:40 PM	5100.001		8.864
1/19/2018	7:54:40 PM	5400.001		8.857
1/19/2018	7:59:40 PM	5700.001		8.859
1/19/2018	8:04:40 PM	6000.001		8.851
1/19/2018	8:09:40 PM	6300.001		8.86
1/19/2018	8:14:40 PM	6600.001		8.856
1/19/2018	8:19:40 PM	6900.001		8.858
1/19/2018	8:24:40 PM	7200.001		8.861
1/19/2018	8:29:40 PM	7500.001		8.854
1/19/2018	8:34:40 PM	7800.001		8.856
1/19/2018	8:39:40 PM	8100.001		8.857
1/19/2018	8:44:40 PM	8400.001		8.853
1/19/2018	8:49:40 PM	8700.001		8.855
1/19/2018	8:54:40 PM	9000.001		8.858
1/19/2018	8:59:40 PM	9300.001		8.854
1/19/2018	9:04:40 PM	9600.001		8.856
1/19/2018	9:09:40 PM	9900.001		8.854
1/19/2018	9:14:40 PM	10200.001		8.852
1/19/2018	9:19:40 PM	10500.001		8.857
1/19/2018	9:24:40 PM	10800.001		8.856
1/19/2018	9:29:40 PM	11100.001		8.852
1/19/2018	9:34:40 PM	11400.001		8.849
1/19/2018	9:39:40 PM	11700.001		8.855
1/19/2018	9:44:40 PM	12000.001		8.851
1/19/2018	9:49:40 PM	12300.001		8.855
1/19/2018	9:54:40 PM	12600.001		8.854
1/19/2018	9:59:40 PM	12900.001		8.85
1/19/2018	10:04:40 PM	13200.001		8.855
1/19/2018	10:09:40 PM	13500.001		8.852
1/19/2018	10:14:40 PM	13800.001		8.851

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1/19/2018	10:19:40 PM	14100.001	8.847
1/19/2018	10:24:40 PM	14400.001	8.847
1/19/2018	10:29:40 PM	14700.001	8.849
1/19/2018	10:34:40 PM	15000.001	8.847
1/19/2018	10:39:40 PM	15300.001	8.845
1/19/2018	10:44:40 PM	15600.001	8.846
1/19/2018	10:49:40 PM	15900.001	8.849
1/19/2018	10:54:40 PM	16200.001	8.846
1/19/2018	10:59:40 PM	16500.001	8.848
1/19/2018	11:04:40 PM	16800.001	8.856
1/19/2018	11:09:40 PM	17100.001	8.847
1/19/2018	11:14:40 PM	17400.001	8.851
1/19/2018	11:19:40 PM	17700.001	8.841
1/19/2018	11:24:40 PM	18000.001	8.85
1/19/2018	11:29:40 PM	18300.001	8.848
1/19/2018	11:34:40 PM	18600.001	8.843
1/19/2018	11:39:40 PM	18900.001	8.847
1/19/2018	11:44:40 PM	19200.001	8.85
1/19/2018	11:49:40 PM	19500.001	8.847
1/19/2018	11:54:40 PM	19800.001	8.848
1/19/2018	11:59:40 PM	20100.001	8.85
1/20/2018	12:04:40 AM	20400.001	8.854
1/20/2018	12:09:40 AM	20700.001	8.849
1/20/2018	12:14:40 AM	21000.001	8.848
1/20/2018	12:19:40 AM	21300.001	8.85
1/20/2018	12:24:40 AM	21600.001	8.846
1/20/2018	12:29:40 AM	21900.001	8.851
1/20/2018	12:34:40 AM	22200.001	8.849
1/20/2018	12:39:40 AM	22500.001	8.861
1/20/2018	12:44:40 AM	22800.001	8.852
1/20/2018	12:49:40 AM	23100.001	8.855
1/20/2018	12:54:40 AM	23400.001	8.852
1/20/2018	12:59:40 AM	23700.001	8.854
1/20/2018	1:04:40 AM	24000.001	8.851
1/20/2018	1:09:40 AM	24300.001	8.851
1/20/2018	1:14:40 AM	24600.001	8.852
1/20/2018	1:19:40 AM	24900.001	8.857
1/20/2018	1:24:40 AM	25200.001	8.854
1/20/2018	1:29:40 AM	25500.001	8.855
1/20/2018	1:34:40 AM	25800.001	8.856
1/20/2018	1:39:40 AM	26100.001	8.855
1/20/2018	1:44:40 AM	26400.001	8.859
1/20/2018	1:49:40 AM	26700.001	8.861
1/20/2018	1:54:40 AM	27000.001	8.856
1/20/2018	1:59:40 AM	27300.001	8.859
1/20/2018	2:04:40 AM	27600.001	8.859
1/20/2018	2:09:40 AM	27900.001	8.86
1/20/2018	2:14:40 AM	28200.001	8.863

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1/20/2018	2:19:40 AM	28500.001	8.861
1/20/2018	2:24:40 AM	28800.001	8.861
1/20/2018	2:29:40 AM	29100.001	8.866
1/20/2018	2:34:40 AM	29400.001	8.859
1/20/2018	2:39:40 AM	29700.001	8.862
1/20/2018	2:44:40 AM	30000.001	8.863
1/20/2018	2:49:40 AM	30300.001	8.866
1/20/2018	2:54:40 AM	30600.001	8.864
1/20/2018	2:59:40 AM	30900.001	8.866
1/20/2018	3:04:40 AM	31200.001	8.867
1/20/2018	3:09:40 AM	31500.001	8.867
1/20/2018	3:14:40 AM	31800.001	8.866
1/20/2018	3:19:40 AM	32100.001	8.866
1/20/2018	3:24:40 AM	32400.001	8.868
1/20/2018	3:29:40 AM	32700.001	8.866
1/20/2018	3:34:40 AM	33000.001	8.865
1/20/2018	3:39:40 AM	33300.001	8.866
1/20/2018	3:44:40 AM	33600.001	8.864
1/20/2018	3:49:40 AM	33900.001	8.864
1/20/2018	3:54:40 AM	34200.001	8.863
1/20/2018	3:59:40 AM	34500.001	8.866
1/20/2018	4:04:40 AM	34800.001	8.869
1/20/2018	4:09:40 AM	35100.001	8.867
1/20/2018	4:14:40 AM	35400.001	8.867
1/20/2018	4:19:40 AM	35700.001	8.867
1/20/2018	4:24:40 AM	36000.001	8.868
1/20/2018	4:29:40 AM	36300.001	8.867
1/20/2018	4:34:40 AM	36600.001	8.869
1/20/2018	4:39:40 AM	36900.001	8.867
1/20/2018	4:44:40 AM	37200.001	8.867
1/20/2018	4:49:40 AM	37500.001	8.867
1/20/2018	4:54:40 AM	37800.001	8.867
1/20/2018	4:59:40 AM	38100.001	8.868
1/20/2018	5:04:40 AM	38400.001	8.871
1/20/2018	5:09:40 AM	38700.001	8.869
1/20/2018	5:14:40 AM	39000.001	8.87
1/20/2018	5:19:40 AM	39300.001	8.868
1/20/2018	5:24:40 AM	39600.001	8.865
1/20/2018	5:29:40 AM	39900.001	8.868
1/20/2018	5:34:40 AM	40200.001	8.87
1/20/2018	5:39:40 AM	40500.001	8.869
1/20/2018	5:44:40 AM	40800.001	8.87
1/20/2018	5:49:40 AM	41100.001	8.865
1/20/2018	5:54:40 AM	41400.001	8.864
1/20/2018	5:59:40 AM	41700.001	8.866
1/20/2018	6:04:40 AM	42000.001	8.863
1/20/2018	6:09:40 AM	42300.001	8.865
1/20/2018	6:14:40 AM	42600.001	8.864

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1/20/2018	6:19:40 AM	42900.001	8.863
1/20/2018	6:24:40 AM	43200.001	8.86
1/20/2018	6:29:40 AM	43500.001	8.864
1/20/2018	6:34:40 AM	43800.001	8.858
1/20/2018	6:39:40 AM	44100.001	8.86
1/20/2018	6:44:40 AM	44400.001	8.86
1/20/2018	6:49:40 AM	44700.001	8.858
1/20/2018	6:54:40 AM	45000.001	8.861
1/20/2018	6:59:40 AM	45300.001	8.861
1/20/2018	7:04:40 AM	45600.001	8.859
1/20/2018	7:09:40 AM	45900.001	8.859
1/20/2018	7:14:40 AM	46200.001	8.864
1/20/2018	7:19:40 AM	46500.001	8.856
1/20/2018	7:24:40 AM	46800.001	8.856
1/20/2018	7:29:40 AM	47100.001	8.858
1/20/2018	7:34:40 AM	47400.001	8.859
1/20/2018	7:39:40 AM	47700.001	8.855
1/20/2018	7:44:40 AM	48000.001	8.856
1/20/2018	7:49:40 AM	48300.001	8.856
1/20/2018	7:54:40 AM	48600.001	8.854
1/20/2018	7:59:40 AM	48900.001	8.851
1/20/2018	8:04:40 AM	49200.001	8.849
1/20/2018	8:09:40 AM	49500.001	8.848
1/20/2018	8:14:40 AM	49800.001	8.859
1/20/2018	8:19:40 AM	50100.001	8.852
1/20/2018	8:24:40 AM	50400.001	8.851
1/20/2018	8:29:40 AM	50700.001	8.851
1/20/2018	8:34:40 AM	51000.001	8.845
1/20/2018	8:39:40 AM	51300.001	8.845
1/20/2018	8:44:40 AM	51600.001	8.846
1/20/2018	8:49:40 AM	51900.001	8.848
1/20/2018	8:54:40 AM	52200.001	8.854
1/20/2018	8:59:40 AM	52500.001	8.853
1/20/2018	9:04:40 AM	52800.001	8.838
1/20/2018	9:09:40 AM	53100.001	8.846
1/20/2018	9:14:40 AM	53400.001	8.851
1/20/2018	9:19:40 AM	53700.001	8.84
1/20/2018	9:24:40 AM	54000.001	8.841
1/20/2018	9:29:40 AM	54300.001	8.834
1/20/2018	9:34:40 AM	54600.001	8.846
1/20/2018	9:39:40 AM	54900.001	8.835
1/20/2018	9:44:40 AM	55200.001	8.838
1/20/2018	9:49:40 AM	55500.001	8.848
1/20/2018	9:54:40 AM	55800.001	8.841
1/20/2018	9:59:40 AM	56100.001	8.84
1/20/2018	10:04:40 AM	56400.001	8.841
1/20/2018	10:09:40 AM	56700.001	8.84
1/20/2018	10:14:40 AM	57000.001	8.84

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1/20/2018	10:19:40 AM	57300.001	8.843
1/20/2018	10:24:40 AM	57600.001	8.839
1/20/2018	10:29:40 AM	57900.001	8.837
1/20/2018	10:34:40 AM	58200.001	8.845
1/20/2018	10:39:40 AM	58500.001	8.833
1/20/2018	10:44:40 AM	58800.001	8.848
1/20/2018	10:49:40 AM	59100.001	8.839
1/20/2018	10:54:40 AM	59400.001	8.85
1/20/2018	10:59:40 AM	59700.001	8.844
1/20/2018	11:04:40 AM	60000.001	8.841
1/20/2018	11:09:40 AM	60300.001	8.84
1/20/2018	11:14:40 AM	60600.001	8.851
1/20/2018	11:19:40 AM	60900.001	8.856
1/20/2018	11:24:40 AM	61200.001	8.844
1/20/2018	11:29:40 AM	61500.001	8.849
1/20/2018	11:34:40 AM	61800.001	8.839
1/20/2018	11:39:40 AM	62100.001	8.843
1/20/2018	11:44:40 AM	62400.001	8.847
1/20/2018	11:49:40 AM	62700.001	8.86
1/20/2018	11:54:40 AM	63000.001	8.856
1/20/2018	11:59:40 AM	63300.001	8.855
1/20/2018	12:04:40 PM	63600.001	8.86
1/20/2018	12:09:40 PM	63900.001	8.847
1/20/2018	12:14:40 PM	64200.001	8.862
1/20/2018	12:19:40 PM	64500.001	8.856
1/20/2018	12:24:40 PM	64800.001	8.867
1/20/2018	12:29:40 PM	65100.001	8.868
1/20/2018	12:34:40 PM	65400.001	8.866
1/20/2018	12:39:40 PM	65700.001	8.865
1/20/2018	12:44:40 PM	66000.001	8.869
1/20/2018	12:49:40 PM	66300.001	8.865
1/20/2018	12:54:40 PM	66600.001	8.878
1/20/2018	12:59:40 PM	66900.001	8.873
1/20/2018	1:04:40 PM	67200.001	8.874
1/20/2018	1:09:40 PM	67500.001	8.864
1/20/2018	1:14:40 PM	67800.001	8.875
1/20/2018	1:19:40 PM	68100.001	8.877
1/20/2018	1:24:40 PM	68400.001	8.877
1/20/2018	1:29:40 PM	68700.001	8.876
1/20/2018	1:34:40 PM	69000.001	8.881
1/20/2018	1:39:40 PM	69300.001	8.886
1/20/2018	1:44:40 PM	69600.001	8.885
1/20/2018	1:49:40 PM	69900.001	8.883
1/20/2018	1:54:40 PM	70200.001	8.885
1/20/2018	1:59:40 PM	70500.001	8.883
1/20/2018	2:04:40 PM	70800.001	8.885
1/20/2018	2:09:40 PM	71100.001	8.882
1/20/2018	2:14:40 PM	71400.001	8.89

130 Ambient.txt

1/20/2018	2:19:40 PM	71700.001	8.887
1/20/2018	2:24:40 PM	72000.001	8.888
1/20/2018	2:29:40 PM	72300.001	8.891
1/20/2018	2:34:40 PM	72600.001	8.888
1/20/2018	2:39:40 PM	72900.001	8.879
1/20/2018	2:44:40 PM	73200.001	8.89
1/20/2018	2:49:40 PM	73500.001	8.886
1/20/2018	2:54:40 PM	73800.001	8.888
1/20/2018	2:59:40 PM	74100.001	8.892
1/20/2018	3:04:40 PM	74400.001	8.887
1/20/2018	3:09:40 PM	74700.001	8.885
1/20/2018	3:14:40 PM	75000.001	8.872
1/20/2018	3:19:40 PM	75300.001	8.897
1/20/2018	3:24:40 PM	75600.001	8.893
1/20/2018	3:29:40 PM	75900.001	8.888
1/20/2018	3:34:40 PM	76200.001	8.89
1/20/2018	3:39:40 PM	76500.001	8.887
1/20/2018	3:44:40 PM	76800.001	8.888
1/20/2018	3:49:40 PM	77100.001	8.896
1/20/2018	3:54:40 PM	77400.001	8.879
1/20/2018	3:59:40 PM	77700.001	8.889
1/20/2018	4:04:40 PM	78000.001	8.888
1/20/2018	4:09:40 PM	78300.001	8.894
1/20/2018	4:14:40 PM	78600.001	8.886
1/20/2018	4:19:40 PM	78900.001	8.864
1/20/2018	4:24:40 PM	79200.001	8.891
1/20/2018	4:29:40 PM	79500.001	8.893
1/20/2018	4:34:40 PM	79800.001	8.88
1/20/2018	4:39:40 PM	80100.001	8.897
1/20/2018	4:44:40 PM	80400.001	8.89
1/20/2018	4:49:40 PM	80700.001	8.884
1/20/2018	4:54:40 PM	81000.001	8.877
1/20/2018	4:59:40 PM	81300.001	8.889
1/20/2018	5:04:40 PM	81600.001	8.89
1/20/2018	5:09:40 PM	81900.001	8.887
1/20/2018	5:14:40 PM	82200.001	8.891
1/20/2018	5:19:40 PM	82500.001	8.882
1/20/2018	5:24:40 PM	82800.001	8.877
1/20/2018	5:29:40 PM	83100.001	8.878
1/20/2018	5:34:40 PM	83400.001	8.883
1/20/2018	5:39:40 PM	83700.001	8.886
1/20/2018	5:44:40 PM	84000.001	8.879
1/20/2018	5:49:40 PM	84300.001	8.88
1/20/2018	5:54:40 PM	84600.001	8.887
1/20/2018	5:59:40 PM	84900.001	8.88
1/20/2018	6:04:40 PM	85200.001	8.875
1/20/2018	6:09:40 PM	85500.001	8.868
1/20/2018	6:14:40 PM	85800.001	8.868

130 Ambient.txt

1/20/2018	6:19:40 PM	86100.001	8.872
1/20/2018	6:24:40 PM	86400.001	8.872
1/20/2018	6:29:40 PM	86700.001	8.879
1/20/2018	6:34:40 PM	87000.001	8.863
1/20/2018	6:39:40 PM	87300.001	8.863
1/20/2018	6:44:40 PM	87600.001	8.865
1/20/2018	6:49:40 PM	87900.001	8.863
1/20/2018	6:54:40 PM	88200.001	8.864
1/20/2018	6:59:40 PM	88500.001	8.865
1/20/2018	7:04:40 PM	88800.001	8.87
1/20/2018	7:09:40 PM	89100.001	8.865
1/20/2018	7:14:40 PM	89400.001	8.866
1/20/2018	7:19:40 PM	89700.001	8.862
1/20/2018	7:24:40 PM	90000.001	8.865
1/20/2018	7:29:40 PM	90300.001	8.866
1/20/2018	7:34:40 PM	90600.001	8.861
1/20/2018	7:39:40 PM	90900.001	8.864
1/20/2018	7:44:40 PM	91200.001	8.864
1/20/2018	7:49:40 PM	91500.001	8.858
1/20/2018	7:54:40 PM	91800.001	8.869
1/20/2018	7:59:40 PM	92100.001	8.866
1/20/2018	8:04:40 PM	92400.001	8.862
1/20/2018	8:09:40 PM	92700.001	8.864
1/20/2018	8:14:40 PM	93000.001	8.862
1/20/2018	8:19:40 PM	93300.001	8.86
1/20/2018	8:24:40 PM	93600.001	8.858
1/20/2018	8:29:40 PM	93900.001	8.859
1/20/2018	8:34:40 PM	94200.001	8.859
1/20/2018	8:39:40 PM	94500.001	8.861
1/20/2018	8:44:40 PM	94800.001	8.86
1/20/2018	8:49:40 PM	95100.001	8.862
1/20/2018	8:54:40 PM	95400.001	8.863
1/20/2018	8:59:40 PM	95700.001	8.859
1/20/2018	9:04:40 PM	96000.001	8.857
1/20/2018	9:09:40 PM	96300.001	8.859
1/20/2018	9:14:40 PM	96600.001	8.86
1/20/2018	9:19:40 PM	96900.001	8.864
1/20/2018	9:24:40 PM	97200.001	8.86
1/20/2018	9:29:40 PM	97500.001	8.861
1/20/2018	9:34:40 PM	97800.001	8.867
1/20/2018	9:39:40 PM	98100.001	8.867
1/20/2018	9:44:40 PM	98400.001	8.867
1/20/2018	9:49:40 PM	98700.001	8.869
1/20/2018	9:54:40 PM	99000.001	8.862
1/20/2018	9:59:40 PM	99300.001	8.866
1/20/2018	10:04:40 PM	99600.001	8.865
1/20/2018	10:09:40 PM	99900.001	8.866
1/20/2018	10:14:40 PM	100200.001	8.864

130 Ambient.txt

1/20/2018	10:19:40 PM	100500.001	8.866
1/20/2018	10:24:40 PM	100800.001	8.869
1/20/2018	10:29:40 PM	101100.001	8.861
1/20/2018	10:34:40 PM	101400.001	8.868
1/20/2018	10:39:40 PM	101700.001	8.865
1/20/2018	10:44:40 PM	102000.001	8.865
1/20/2018	10:49:40 PM	102300.001	8.865
1/20/2018	10:54:40 PM	102600.001	8.867
1/20/2018	10:59:40 PM	102900.001	8.867
1/20/2018	11:04:40 PM	103200.001	8.869
1/20/2018	11:09:40 PM	103500.001	8.863
1/20/2018	11:14:40 PM	103800.001	8.865
1/20/2018	11:19:40 PM	104100.001	8.866
1/20/2018	11:24:40 PM	104400.001	8.863
1/20/2018	11:29:40 PM	104700.001	8.866
1/20/2018	11:34:40 PM	105000.001	8.867
1/20/2018	11:39:40 PM	105300.001	8.864
1/20/2018	11:44:40 PM	105600.001	8.865
1/20/2018	11:49:40 PM	105900.001	8.863
1/20/2018	11:54:40 PM	106200.001	8.86
1/20/2018	11:59:40 PM	106500.001	8.864
1/21/2018	12:04:40 AM	106800.001	8.863
1/21/2018	12:09:40 AM	107100.001	8.865
1/21/2018	12:14:40 AM	107400.001	8.868
1/21/2018	12:19:40 AM	107700.001	8.864
1/21/2018	12:24:40 AM	108000.001	8.865
1/21/2018	12:29:40 AM	108300.001	8.865
1/21/2018	12:34:40 AM	108600.001	8.861
1/21/2018	12:39:40 AM	108900.001	8.868
1/21/2018	12:44:40 AM	109200.001	8.865
1/21/2018	12:49:40 AM	109500.001	8.864
1/21/2018	12:54:40 AM	109800.001	8.864
1/21/2018	12:59:40 AM	110100.001	8.862
1/21/2018	1:04:40 AM	110400.001	8.866
1/21/2018	1:09:40 AM	110700.001	8.862
1/21/2018	1:14:40 AM	111000.001	8.867
1/21/2018	1:19:40 AM	111300.001	8.86
1/21/2018	1:24:40 AM	111600.001	8.865
1/21/2018	1:29:40 AM	111900.001	8.865
1/21/2018	1:34:40 AM	112200.001	8.861
1/21/2018	1:39:40 AM	112500.001	8.865
1/21/2018	1:44:40 AM	112800.001	8.865
1/21/2018	1:49:40 AM	113100.001	8.865
1/21/2018	1:54:40 AM	113400.001	8.864
1/21/2018	1:59:40 AM	113700.001	8.859
1/21/2018	2:04:40 AM	114000.001	8.863
1/21/2018	2:09:40 AM	114300.001	8.86
1/21/2018	2:14:40 AM	114600.001	8.863

130 Ambient.txt

1/21/2018	2:19:40 AM	114900.001	8.862
1/21/2018	2:24:40 AM	115200.001	8.865
1/21/2018	2:29:40 AM	115500.001	8.865
1/21/2018	2:34:40 AM	115800.001	8.862
1/21/2018	2:39:40 AM	116100.001	8.86
1/21/2018	2:44:40 AM	116400.001	8.865
1/21/2018	2:49:40 AM	116700.001	8.867
1/21/2018	2:54:40 AM	117000.001	8.865
1/21/2018	2:59:40 AM	117300.001	8.862
1/21/2018	3:04:40 AM	117600.001	8.867
1/21/2018	3:09:40 AM	117900.001	8.865
1/21/2018	3:14:40 AM	118200.001	8.87
1/21/2018	3:19:40 AM	118500.001	8.869
1/21/2018	3:24:40 AM	118800.001	8.871
1/21/2018	3:29:40 AM	119100.001	8.866
1/21/2018	3:34:40 AM	119400.001	8.871
1/21/2018	3:39:40 AM	119700.001	8.869
1/21/2018	3:44:40 AM	120000.001	8.868
1/21/2018	3:49:40 AM	120300.001	8.871
1/21/2018	3:54:40 AM	120600.001	8.866
1/21/2018	3:59:40 AM	120900.001	8.87
1/21/2018	4:04:40 AM	121200.001	8.866
1/21/2018	4:09:40 AM	121500.001	8.872
1/21/2018	4:14:40 AM	121800.001	8.872
1/21/2018	4:19:40 AM	122100.001	8.875
1/21/2018	4:24:40 AM	122400.001	8.874
1/21/2018	4:29:40 AM	122700.001	8.869
1/21/2018	4:34:40 AM	123000.001	8.871
1/21/2018	4:39:40 AM	123300.001	8.872
1/21/2018	4:44:40 AM	123600.001	8.868
1/21/2018	4:49:40 AM	123900.001	8.869
1/21/2018	4:54:40 AM	124200.001	8.872
1/21/2018	4:59:40 AM	124500.001	8.866
1/21/2018	5:04:40 AM	124800.001	8.87
1/21/2018	5:09:40 AM	125100.001	8.868
1/21/2018	5:14:40 AM	125400.001	8.865
1/21/2018	5:19:40 AM	125700.001	8.864
1/21/2018	5:24:40 AM	126000.001	8.866
1/21/2018	5:29:40 AM	126300.001	8.863
1/21/2018	5:34:40 AM	126600.001	8.866
1/21/2018	5:39:40 AM	126900.001	8.867
1/21/2018	5:44:40 AM	127200.001	8.87
1/21/2018	5:49:40 AM	127500.001	8.867
1/21/2018	5:54:40 AM	127800.001	8.865
1/21/2018	5:59:40 AM	128100.001	8.868
1/21/2018	6:04:40 AM	128400.001	8.868
1/21/2018	6:09:40 AM	128700.001	8.863
1/21/2018	6:14:40 AM	129000.001	8.867

130 Ambient.txt

1/21/2018	6:19:40 AM	129300.001	8.867
1/21/2018	6:24:40 AM	129600.001	8.867
1/21/2018	6:29:40 AM	129900.001	8.867
1/21/2018	6:34:40 AM	130200.001	8.868
1/21/2018	6:39:40 AM	130500.001	8.862
1/21/2018	6:44:40 AM	130800.001	8.867
1/21/2018	6:49:40 AM	131100.001	8.867
1/21/2018	6:54:40 AM	131400.001	8.867
1/21/2018	6:59:40 AM	131700.001	8.864
1/21/2018	7:04:40 AM	132000.001	8.867
1/21/2018	7:09:40 AM	132300.001	8.867
1/21/2018	7:14:40 AM	132600.001	8.865
1/21/2018	7:19:40 AM	132900.001	8.863
1/21/2018	7:24:40 AM	133200.001	8.864
1/21/2018	7:29:40 AM	133500.001	8.866
1/21/2018	7:34:40 AM	133800.001	8.862
1/21/2018	7:39:40 AM	134100.001	8.863
1/21/2018	7:44:40 AM	134400.001	8.86
1/21/2018	7:49:40 AM	134700.001	8.861
1/21/2018	7:54:40 AM	135000.001	8.867
1/21/2018	7:59:40 AM	135300.001	8.859
1/21/2018	8:04:40 AM	135600.001	8.864
1/21/2018	8:09:40 AM	135900.001	8.861
1/21/2018	8:14:40 AM	136200.001	8.86
1/21/2018	8:19:40 AM	136500.001	8.86
1/21/2018	8:24:40 AM	136800.001	8.857
1/21/2018	8:29:40 AM	137100.001	8.862
1/21/2018	8:34:40 AM	137400.001	8.859
1/21/2018	8:39:40 AM	137700.001	8.86
1/21/2018	8:44:40 AM	138000.001	8.861
1/21/2018	8:49:40 AM	138300.001	8.86
1/21/2018	8:54:40 AM	138600.001	8.854
1/21/2018	8:59:40 AM	138900.001	8.858
1/21/2018	9:04:40 AM	139200.001	8.857
1/21/2018	9:09:40 AM	139500.001	8.862
1/21/2018	9:14:40 AM	139800.001	8.857
1/21/2018	9:19:40 AM	140100.001	8.852
1/21/2018	9:24:40 AM	140400.001	8.849
1/21/2018	9:29:40 AM	140700.001	8.852
1/21/2018	9:34:40 AM	141000.001	8.844
1/21/2018	9:39:40 AM	141300.001	8.847
1/21/2018	9:44:40 AM	141600.001	8.847
1/21/2018	9:49:40 AM	141900.001	8.85
1/21/2018	9:54:40 AM	142200.001	8.846
1/21/2018	9:59:40 AM	142500.001	8.841
1/21/2018	10:04:40 AM	142800.001	8.841
1/21/2018	10:09:40 AM	143100.001	8.842
1/21/2018	10:14:40 AM	143400.001	8.841

130 Ambient.txt

1/21/2018	10:19:40 AM	143700.001	8.84
1/21/2018	10:24:40 AM	144000.001	8.841
1/21/2018	10:29:40 AM	144300.001	8.84
1/21/2018	10:34:40 AM	144600.001	8.84
1/21/2018	10:39:40 AM	144900.001	8.84
1/21/2018	10:44:40 AM	145200.001	8.845
1/21/2018	10:49:40 AM	145500.001	8.84
1/21/2018	10:54:40 AM	145800.001	8.84
1/21/2018	10:59:40 AM	146100.001	8.85
1/21/2018	11:04:40 AM	146400.001	8.837
1/21/2018	11:09:40 AM	146700.001	8.844
1/21/2018	11:14:40 AM	147000.001	8.811
1/21/2018	11:19:40 AM	147300.001	8.851
1/21/2018	11:24:40 AM	147600.001	8.847
1/21/2018	11:29:40 AM	147900.001	8.857
1/21/2018	11:34:40 AM	148200.001	8.86
1/21/2018	11:39:40 AM	148500.001	8.858
1/21/2018	11:44:40 AM	148800.001	8.857
1/21/2018	11:49:40 AM	149100.001	8.85
1/21/2018	11:54:40 AM	149400.001	8.863
1/21/2018	11:59:40 AM	149700.001	8.859
1/21/2018	12:04:40 PM	150000.001	8.874
1/21/2018	12:09:40 PM	150300.001	8.862
1/21/2018	12:14:40 PM	150600.001	8.873
1/21/2018	12:19:40 PM	150900.001	8.875
1/21/2018	12:24:40 PM	151200.001	8.87
1/21/2018	12:29:40 PM	151500.001	8.873
1/21/2018	12:34:40 PM	151800.001	8.873
1/21/2018	12:39:40 PM	152100.001	8.87
1/21/2018	12:44:40 PM	152400.001	8.884
1/21/2018	12:49:40 PM	152700.001	8.886
1/21/2018	12:54:40 PM	153000.001	8.898
1/21/2018	12:59:40 PM	153300.001	8.889
1/21/2018	1:04:40 PM	153600.001	8.896
1/21/2018	1:09:40 PM	153900.001	8.889
1/21/2018	1:14:40 PM	154200.001	8.896
1/21/2018	1:19:40 PM	154500.001	8.884
1/21/2018	1:24:40 PM	154800.001	8.898
1/21/2018	1:29:40 PM	155100.001	8.909
1/21/2018	1:34:40 PM	155400.001	8.902
1/21/2018	1:39:40 PM	155700.001	8.902
1/21/2018	1:44:40 PM	156000.001	8.875
1/21/2018	1:49:40 PM	156300.001	8.894
1/21/2018	1:54:40 PM	156600.001	8.917
1/21/2018	1:59:40 PM	156900.001	8.914
1/21/2018	2:04:40 PM	157200.001	8.898
1/21/2018	2:09:40 PM	157500.001	8.908
1/21/2018	2:14:40 PM	157800.001	8.906

130 Ambient.txt

1/21/2018	2:19:40 PM	158100.001	8.915
1/21/2018	2:24:40 PM	158400.001	8.91
1/21/2018	2:29:40 PM	158700.001	8.913
1/21/2018	2:34:40 PM	159000.001	8.895
1/21/2018	2:39:40 PM	159300.001	8.922
1/21/2018	2:44:40 PM	159600.001	8.914
1/21/2018	2:49:40 PM	159900.001	8.911
1/21/2018	2:54:40 PM	160200.001	8.892
1/21/2018	2:59:40 PM	160500.001	8.924
1/21/2018	3:04:40 PM	160800.001	8.929
1/21/2018	3:09:40 PM	161100.001	8.92
1/21/2018	3:14:40 PM	161400.001	8.921
1/21/2018	3:19:40 PM	161700.001	8.923
1/21/2018	3:24:40 PM	162000.001	8.93
1/21/2018	3:29:40 PM	162300.001	8.937
1/21/2018	3:34:40 PM	162600.001	8.916
1/21/2018	3:39:40 PM	162900.001	8.932
1/21/2018	3:44:40 PM	163200.001	8.921
1/21/2018	3:49:40 PM	163500.001	8.927
1/21/2018	3:54:40 PM	163800.001	8.92
1/21/2018	3:59:40 PM	164100.001	8.922
1/21/2018	4:04:40 PM	164400.001	8.924
1/21/2018	4:09:40 PM	164700.001	8.922
1/21/2018	4:14:40 PM	165000.001	8.923
1/21/2018	4:19:40 PM	165300.001	8.917
1/21/2018	4:24:40 PM	165600.001	8.913
1/21/2018	4:29:40 PM	165900.001	8.925
1/21/2018	4:34:40 PM	166200.001	8.925
1/21/2018	4:39:40 PM	166500.001	8.923
1/21/2018	4:44:40 PM	166800.001	8.923
1/21/2018	4:49:40 PM	167100.001	8.923
1/21/2018	4:54:40 PM	167400.001	8.922
1/21/2018	4:59:40 PM	167700.001	8.925
1/21/2018	5:04:40 PM	168000.001	8.922
1/21/2018	5:09:40 PM	168300.001	8.92
1/21/2018	5:14:40 PM	168600.001	8.922
1/21/2018	5:19:40 PM	168900.001	8.924
1/21/2018	5:24:40 PM	169200.001	8.917
1/21/2018	5:29:40 PM	169500.001	8.919
1/21/2018	5:34:40 PM	169800.001	8.919
1/21/2018	5:39:40 PM	170100.001	8.923
1/21/2018	5:44:40 PM	170400.001	8.913
1/21/2018	5:49:40 PM	170700.001	8.917
1/21/2018	5:54:40 PM	171000.001	8.918
1/21/2018	5:59:40 PM	171300.001	8.917
1/21/2018	6:04:40 PM	171600.001	8.912
1/21/2018	6:09:40 PM	171900.001	8.917
1/21/2018	6:14:40 PM	172200.001	8.914

130 Ambient.txt

1/21/2018	6:19:40 PM	172500.001	8.916
1/21/2018	6:24:40 PM	172800.001	8.918
1/21/2018	6:29:40 PM	173100.001	8.912
1/21/2018	6:34:40 PM	173400.001	8.913
1/21/2018	6:39:40 PM	173700.001	8.922
1/21/2018	6:44:40 PM	174000.001	8.915
1/21/2018	6:49:40 PM	174300.001	8.921
1/21/2018	6:54:40 PM	174600.001	8.915
1/21/2018	6:59:40 PM	174900.001	8.916
1/21/2018	7:04:40 PM	175200.001	8.921
1/21/2018	7:09:40 PM	175500.001	8.92
1/21/2018	7:14:40 PM	175800.001	8.915
1/21/2018	7:19:40 PM	176100.001	8.907
1/21/2018	7:24:40 PM	176400.001	8.91
1/21/2018	7:29:40 PM	176700.001	8.915
1/21/2018	7:34:40 PM	177000.001	8.917
1/21/2018	7:39:40 PM	177300.001	8.918
1/21/2018	7:44:40 PM	177600.001	8.915
1/21/2018	7:49:40 PM	177900.001	8.917
1/21/2018	7:54:40 PM	178200.001	8.916
1/21/2018	7:59:40 PM	178500.001	8.916
1/21/2018	8:04:40 PM	178800.001	8.925
1/21/2018	8:09:40 PM	179100.001	8.922
1/21/2018	8:14:40 PM	179400.001	8.926
1/21/2018	8:19:40 PM	179700.001	8.924
1/21/2018	8:24:40 PM	180000.001	8.926
1/21/2018	8:29:40 PM	180300.001	8.931
1/21/2018	8:34:40 PM	180600.001	8.926
1/21/2018	8:39:40 PM	180900.001	8.927
1/21/2018	8:44:40 PM	181200.001	8.929
1/21/2018	8:49:40 PM	181500.001	8.926
1/21/2018	8:54:40 PM	181800.001	8.924
1/21/2018	8:59:40 PM	182100.001	8.928
1/21/2018	9:04:40 PM	182400.001	8.928
1/21/2018	9:09:40 PM	182700.001	8.937
1/21/2018	9:14:40 PM	183000.001	8.927
1/21/2018	9:19:40 PM	183300.001	8.93
1/21/2018	9:24:40 PM	183600.001	8.942
1/21/2018	9:29:40 PM	183900.001	8.935
1/21/2018	9:34:40 PM	184200.001	8.939
1/21/2018	9:39:40 PM	184500.001	8.935
1/21/2018	9:44:40 PM	184800.001	8.937
1/21/2018	9:49:40 PM	185100.001	8.935
1/21/2018	9:54:40 PM	185400.001	8.932
1/21/2018	9:59:40 PM	185700.001	8.93
1/21/2018	10:04:40 PM	186000.001	8.931
1/21/2018	10:09:40 PM	186300.001	8.927
1/21/2018	10:14:40 PM	186600.001	8.926

130 Ambient.txt

1/21/2018	10:19:40 PM	186900.001	8.931
1/21/2018	10:24:40 PM	187200.001	8.928
1/21/2018	10:29:40 PM	187500.001	8.922
1/21/2018	10:34:40 PM	187800.001	8.929
1/21/2018	10:39:40 PM	188100.001	8.931
1/21/2018	10:44:40 PM	188400.001	8.922
1/21/2018	10:49:40 PM	188700.001	8.929
1/21/2018	10:54:40 PM	189000.001	8.928
1/21/2018	10:59:40 PM	189300.001	8.928
1/21/2018	11:04:40 PM	189600.001	8.928
1/21/2018	11:09:40 PM	189900.001	8.929
1/21/2018	11:14:40 PM	190200.001	8.93
1/21/2018	11:19:40 PM	190500.001	8.93
1/21/2018	11:24:40 PM	190800.001	8.932
1/21/2018	11:29:40 PM	191100.001	8.929
1/21/2018	11:34:40 PM	191400.001	8.936
1/21/2018	11:39:40 PM	191700.001	8.943
1/21/2018	11:44:40 PM	192000.001	8.935
1/21/2018	11:49:40 PM	192300.001	8.935
1/21/2018	11:54:40 PM	192600.001	8.935
1/21/2018	11:59:40 PM	192900.001	8.937
1/22/2018	12:04:40 AM	193200.001	8.94
1/22/2018	12:09:40 AM	193500.001	8.938
1/22/2018	12:14:40 AM	193800.001	8.941
1/22/2018	12:19:40 AM	194100.001	8.936
1/22/2018	12:24:40 AM	194400.001	8.934
1/22/2018	12:29:40 AM	194700.001	8.933
1/22/2018	12:34:40 AM	195000.001	8.937
1/22/2018	12:39:40 AM	195300.001	8.927
1/22/2018	12:44:40 AM	195600.001	8.926
1/22/2018	12:49:40 AM	195900.001	8.927
1/22/2018	12:54:40 AM	196200.001	8.934
1/22/2018	12:59:40 AM	196500.001	8.932
1/22/2018	1:04:40 AM	196800.001	8.932
1/22/2018	1:09:40 AM	197100.001	8.926
1/22/2018	1:14:40 AM	197400.001	8.927
1/22/2018	1:19:40 AM	197700.001	8.924
1/22/2018	1:24:40 AM	198000.001	8.931
1/22/2018	1:29:40 AM	198300.001	8.931
1/22/2018	1:34:40 AM	198600.001	8.92
1/22/2018	1:39:40 AM	198900.001	8.921
1/22/2018	1:44:40 AM	199200.001	8.925
1/22/2018	1:49:40 AM	199500.001	8.918
1/22/2018	1:54:40 AM	199800.001	8.922
1/22/2018	1:59:40 AM	200100.001	8.92
1/22/2018	2:04:40 AM	200400.001	8.918
1/22/2018	2:09:40 AM	200700.001	8.914
1/22/2018	2:14:40 AM	201000.001	8.915

130 Ambient.txt

1/22/2018	2:19:40 AM	201300.001	8.917
1/22/2018	2:24:40 AM	201600.001	8.917
1/22/2018	2:29:40 AM	201900.001	8.919
1/22/2018	2:34:40 AM	202200.001	8.914
1/22/2018	2:39:40 AM	202500.001	8.915
1/22/2018	2:44:40 AM	202800.001	8.906
1/22/2018	2:49:40 AM	203100.001	8.911
1/22/2018	2:54:40 AM	203400.001	8.909
1/22/2018	2:59:40 AM	203700.001	8.912
1/22/2018	3:04:40 AM	204000.001	8.91
1/22/2018	3:09:40 AM	204300.001	8.908
1/22/2018	3:14:40 AM	204600.001	8.909
1/22/2018	3:19:40 AM	204900.001	8.91
1/22/2018	3:24:40 AM	205200.001	8.911
1/22/2018	3:29:40 AM	205500.001	8.91
1/22/2018	3:34:40 AM	205800.001	8.91
1/22/2018	3:39:40 AM	206100.001	8.908
1/22/2018	3:44:40 AM	206400.001	8.909
1/22/2018	3:49:40 AM	206700.001	8.909
1/22/2018	3:54:40 AM	207000.001	8.908
1/22/2018	3:59:40 AM	207300.001	8.901
1/22/2018	4:04:40 AM	207600.001	8.904
1/22/2018	4:09:40 AM	207900.001	8.894
1/22/2018	4:14:40 AM	208200.001	8.898
1/22/2018	4:19:40 AM	208500.001	8.898
1/22/2018	4:24:40 AM	208800.001	8.908
1/22/2018	4:29:40 AM	209100.001	8.901
1/22/2018	4:34:40 AM	209400.001	8.901
1/22/2018	4:39:40 AM	209700.001	8.899
1/22/2018	4:44:40 AM	210000.001	8.901
1/22/2018	4:49:40 AM	210300.001	8.898
1/22/2018	4:54:40 AM	210600.001	8.9
1/22/2018	4:59:40 AM	210900.001	8.897
1/22/2018	5:04:40 AM	211200.001	8.892
1/22/2018	5:09:40 AM	211500.001	8.89
1/22/2018	5:14:40 AM	211800.001	8.891
1/22/2018	5:19:40 AM	212100.001	8.887
1/22/2018	5:24:40 AM	212400.001	8.891
1/22/2018	5:29:40 AM	212700.001	8.893
1/22/2018	5:34:40 AM	213000.001	8.887
1/22/2018	5:39:40 AM	213300.001	8.889
1/22/2018	5:44:40 AM	213600.001	8.886
1/22/2018	5:49:40 AM	213900.001	8.882
1/22/2018	5:54:40 AM	214200.001	8.881
1/22/2018	5:59:40 AM	214500.001	8.88
1/22/2018	6:04:40 AM	214800.001	8.873
1/22/2018	6:09:40 AM	215100.001	8.873
1/22/2018	6:14:40 AM	215400.001	8.869

130 Ambient.txt

1/22/2018	6:19:40 AM	215700.001	8.868
1/22/2018	6:24:40 AM	216000.001	8.87
1/22/2018	6:29:40 AM	216300.001	8.869
1/22/2018	6:34:40 AM	216600.001	8.873
1/22/2018	6:39:40 AM	216900.001	8.864
1/22/2018	6:44:40 AM	217200.001	8.865
1/22/2018	6:49:40 AM	217500.001	8.866
1/22/2018	6:54:40 AM	217800.001	8.863
1/22/2018	6:59:40 AM	218100.001	8.862
1/22/2018	7:04:40 AM	218400.001	8.86
1/22/2018	7:09:40 AM	218700.001	8.86
1/22/2018	7:14:40 AM	219000.001	8.862
1/22/2018	7:19:40 AM	219300.001	8.856
1/22/2018	7:24:40 AM	219600.001	8.855
1/22/2018	7:29:40 AM	219900.001	8.857
1/22/2018	7:34:40 AM	220200.001	8.856
1/22/2018	7:39:40 AM	220500.001	8.856
1/22/2018	7:44:40 AM	220800.001	8.856
1/22/2018	7:49:40 AM	221100.001	8.854
1/22/2018	7:54:40 AM	221400.001	8.851
1/22/2018	7:59:40 AM	221700.001	8.853
1/22/2018	8:04:40 AM	222000.001	8.846
1/22/2018	8:09:40 AM	222300.001	8.848
1/22/2018	8:14:40 AM	222600.001	8.839
1/22/2018	8:19:40 AM	222900.001	8.841
1/22/2018	8:24:40 AM	223200.001	8.839
1/22/2018	8:29:40 AM	223500.001	8.843
1/22/2018	8:34:40 AM	223800.001	8.843
1/22/2018	8:39:40 AM	224100.001	8.839
1/22/2018	8:44:40 AM	224400.001	8.829
1/22/2018	8:49:40 AM	224700.001	8.833
1/22/2018	8:54:40 AM	225000.001	8.827
1/22/2018	8:59:40 AM	225300.001	8.839
1/22/2018	9:04:40 AM	225600.001	8.828
1/22/2018	9:09:40 AM	225900.001	8.833
1/22/2018	9:14:40 AM	226200.001	8.839
1/22/2018	9:19:40 AM	226500.001	8.831
1/22/2018	9:24:40 AM	226800.001	8.823
1/22/2018	9:29:40 AM	227100.001	8.823
1/22/2018	9:34:40 AM	227400.001	8.823
1/22/2018	9:39:40 AM	227700.001	8.811
1/22/2018	9:44:40 AM	228000.001	8.828
1/22/2018	9:49:40 AM	228300.001	8.823
1/22/2018	9:54:40 AM	228600.001	8.808
1/22/2018	9:59:40 AM	228900.001	8.811
1/22/2018	10:04:40 AM	229200.001	8.808
1/22/2018	10:09:40 AM	229500.001	8.83
1/22/2018	10:14:40 AM	229800.001	8.813

130 Ambient.txt			
1/22/2018	10:19:40 AM	230100.001	8.824
1/22/2018	10:24:40 AM	230400.001	8.727
1/22/2018	10:29:40 AM	230700.001	8.769
1/22/2018	10:34:40 AM	231000.001	8.808
1/22/2018	10:39:40 AM	231300.001	8.808
1/22/2018	10:44:40 AM	231600.001	8.85

MW08 Ambient.txt			
Date	Time	Seconds	Depth (ft)
1/19/2018	6:25:00 PM	0	18.78
1/19/2018	6:30:00 PM	300	18.781
1/19/2018	6:35:00 PM	600	18.796
1/19/2018	6:40:00 PM	900	18.812
1/19/2018	6:45:00 PM	1200	18.792
1/19/2018	6:50:00 PM	1500	18.798
1/19/2018	6:55:00 PM	1800	18.801
1/19/2018	7:00:00 PM	2100	18.804
1/19/2018	7:05:00 PM	2400	18.805
1/19/2018	7:10:00 PM	2700	18.806
1/19/2018	7:15:00 PM	3000	18.817
1/19/2018	7:20:00 PM	3300	18.806
1/19/2018	7:25:00 PM	3600	18.814
1/19/2018	7:30:00 PM	3900	18.807
1/19/2018	7:35:00 PM	4200	18.797
1/19/2018	7:40:00 PM	4500	18.809
1/19/2018	7:45:00 PM	4800	18.804
1/19/2018	7:50:00 PM	5100	18.814
1/19/2018	7:55:00 PM	5400	18.808
1/19/2018	8:00:00 PM	5700	18.804
1/19/2018	8:05:00 PM	6000	18.802
1/19/2018	8:10:00 PM	6300	18.802
1/19/2018	8:15:00 PM	6600	18.803
1/19/2018	8:20:00 PM	6900	18.806
1/19/2018	8:25:00 PM	7200	18.805
1/19/2018	8:30:00 PM	7500	18.801
1/19/2018	8:35:00 PM	7800	18.803
1/19/2018	8:40:00 PM	8100	18.801
1/19/2018	8:45:00 PM	8400	18.802
1/19/2018	8:50:00 PM	8700	18.802
1/19/2018	8:55:00 PM	9000	18.804
1/19/2018	9:00:00 PM	9300	18.803
1/19/2018	9:05:00 PM	9600	18.808
1/19/2018	9:10:00 PM	9900	18.804
1/19/2018	9:15:00 PM	10200	18.802
1/19/2018	9:20:00 PM	10500	18.802
1/19/2018	9:25:00 PM	10800	18.805
1/19/2018	9:30:00 PM	11100	18.811
1/19/2018	9:35:00 PM	11400	18.799
1/19/2018	9:40:00 PM	11700	18.806
1/19/2018	9:45:00 PM	12000	18.802
1/19/2018	9:50:00 PM	12300	18.799
1/19/2018	9:55:00 PM	12600	18.804
1/19/2018	10:00:00 PM	12900	18.798
1/19/2018	10:05:00 PM	13200	18.806
1/19/2018	10:10:00 PM	13500	18.806
1/19/2018	10:15:00 PM	13800	18.802

MW08 Ambient.txt

1/19/2018	10:20:00 PM	14100	18.791
1/19/2018	10:25:00 PM	14400	18.8
1/19/2018	10:30:00 PM	14700	18.803
1/19/2018	10:35:00 PM	15000	18.8
1/19/2018	10:40:00 PM	15300	18.798
1/19/2018	10:45:00 PM	15600	18.805
1/19/2018	10:50:00 PM	15900	18.797
1/19/2018	10:55:00 PM	16200	18.793
1/19/2018	11:00:00 PM	16500	18.797
1/19/2018	11:05:00 PM	16800	18.795
1/19/2018	11:10:00 PM	17100	18.797
1/19/2018	11:15:00 PM	17400	18.793
1/19/2018	11:20:00 PM	17700	18.797
1/19/2018	11:25:00 PM	18000	18.803
1/19/2018	11:30:00 PM	18300	18.797
1/19/2018	11:35:00 PM	18600	18.795
1/19/2018	11:40:00 PM	18900	18.796
1/19/2018	11:45:00 PM	19200	18.796
1/19/2018	11:50:00 PM	19500	18.793
1/19/2018	11:55:00 PM	19800	18.8
1/20/2018	12:00:00 AM	20100	18.797
1/20/2018	12:05:00 AM	20400	18.803
1/20/2018	12:10:00 AM	20700	18.809
1/20/2018	12:15:00 AM	21000	18.783
1/20/2018	12:20:00 AM	21300	18.792
1/20/2018	12:25:00 AM	21600	18.795
1/20/2018	12:30:00 AM	21900	18.806
1/20/2018	12:35:00 AM	22200	18.806
1/20/2018	12:40:00 AM	22500	18.842
1/20/2018	12:45:00 AM	22800	18.773
1/20/2018	12:50:00 AM	23100	18.786
1/20/2018	12:55:00 AM	23400	18.796
1/20/2018	1:00:00 AM	23700	18.799
1/20/2018	1:05:00 AM	24000	18.795
1/20/2018	1:10:00 AM	24300	18.797
1/20/2018	1:15:00 AM	24600	18.786
1/20/2018	1:20:00 AM	24900	18.796
1/20/2018	1:25:00 AM	25200	18.799
1/20/2018	1:30:00 AM	25500	18.798
1/20/2018	1:35:00 AM	25800	18.794
1/20/2018	1:40:00 AM	26100	18.8
1/20/2018	1:45:00 AM	26400	18.793
1/20/2018	1:50:00 AM	26700	18.795
1/20/2018	1:55:00 AM	27000	18.796
1/20/2018	2:00:00 AM	27300	18.8
1/20/2018	2:05:00 AM	27600	18.795
1/20/2018	2:10:00 AM	27900	18.794
1/20/2018	2:15:00 AM	28200	18.805

MW08 Ambient.txt

1/20/2018	2:20:00 AM	28500	18.801
1/20/2018	2:25:00 AM	28800	18.793
1/20/2018	2:30:00 AM	29100	18.794
1/20/2018	2:35:00 AM	29400	18.805
1/20/2018	2:40:00 AM	29700	18.798
1/20/2018	2:45:00 AM	30000	18.798
1/20/2018	2:50:00 AM	30300	18.808
1/20/2018	2:55:00 AM	30600	18.805
1/20/2018	3:00:00 AM	30900	18.804
1/20/2018	3:05:00 AM	31200	18.808
1/20/2018	3:10:00 AM	31500	18.8
1/20/2018	3:15:00 AM	31800	18.8
1/20/2018	3:20:00 AM	32100	18.801
1/20/2018	3:25:00 AM	32400	18.799
1/20/2018	3:30:00 AM	32700	18.806
1/20/2018	3:35:00 AM	33000	18.806
1/20/2018	3:40:00 AM	33300	18.812
1/20/2018	3:45:00 AM	33600	18.804
1/20/2018	3:50:00 AM	33900	18.806
1/20/2018	3:55:00 AM	34200	18.807
1/20/2018	4:00:00 AM	34500	18.807
1/20/2018	4:05:00 AM	34800	18.806
1/20/2018	4:10:00 AM	35100	18.812
1/20/2018	4:15:00 AM	35400	18.805
1/20/2018	4:20:00 AM	35700	18.807
1/20/2018	4:25:00 AM	36000	18.806
1/20/2018	4:30:00 AM	36300	18.807
1/20/2018	4:35:00 AM	36600	18.805
1/20/2018	4:40:00 AM	36900	18.805
1/20/2018	4:45:00 AM	37200	18.804
1/20/2018	4:50:00 AM	37500	18.809
1/20/2018	4:55:00 AM	37800	18.808
1/20/2018	5:00:00 AM	38100	18.806
1/20/2018	5:05:00 AM	38400	18.806
1/20/2018	5:10:00 AM	38700	18.809
1/20/2018	5:15:00 AM	39000	18.806
1/20/2018	5:20:00 AM	39300	18.813
1/20/2018	5:25:00 AM	39600	18.815
1/20/2018	5:30:00 AM	39900	18.811
1/20/2018	5:35:00 AM	40200	18.812
1/20/2018	5:40:00 AM	40500	18.81
1/20/2018	5:45:00 AM	40800	18.814
1/20/2018	5:50:00 AM	41100	18.812
1/20/2018	5:55:00 AM	41400	18.817
1/20/2018	6:00:00 AM	41700	18.813
1/20/2018	6:05:00 AM	42000	18.815
1/20/2018	6:10:00 AM	42300	18.812
1/20/2018	6:15:00 AM	42600	18.812

MW08 Ambient.txt

1/20/2018	6:20:00 AM	42900	18.817
1/20/2018	6:25:00 AM	43200	18.809
1/20/2018	6:30:00 AM	43500	18.812
1/20/2018	6:35:00 AM	43800	18.812
1/20/2018	6:40:00 AM	44100	18.815
1/20/2018	6:45:00 AM	44400	18.817
1/20/2018	6:50:00 AM	44700	18.816
1/20/2018	6:55:00 AM	45000	18.826
1/20/2018	7:00:00 AM	45300	18.813
1/20/2018	7:05:00 AM	45600	18.818
1/20/2018	7:10:00 AM	45900	18.821
1/20/2018	7:15:00 AM	46200	18.814
1/20/2018	7:20:00 AM	46500	18.812
1/20/2018	7:25:00 AM	46800	18.807
1/20/2018	7:30:00 AM	47100	18.813
1/20/2018	7:35:00 AM	47400	18.804
1/20/2018	7:40:00 AM	47700	18.801
1/20/2018	7:45:00 AM	48000	18.812
1/20/2018	7:50:00 AM	48300	18.81
1/20/2018	7:55:00 AM	48600	18.822
1/20/2018	8:00:00 AM	48900	18.8
1/20/2018	8:05:00 AM	49200	18.779
1/20/2018	8:10:00 AM	49500	18.782
1/20/2018	8:15:00 AM	49800	18.842
1/20/2018	8:20:00 AM	50100	18.822
1/20/2018	8:25:00 AM	50400	18.798
1/20/2018	8:30:00 AM	50700	18.807
1/20/2018	8:35:00 AM	51000	18.76
1/20/2018	8:40:00 AM	51300	18.772
1/20/2018	8:45:00 AM	51600	18.82
1/20/2018	8:50:00 AM	51900	18.8
1/20/2018	8:55:00 AM	52200	18.841
1/20/2018	9:00:00 AM	52500	18.832
1/20/2018	9:05:00 AM	52800	18.751
1/20/2018	9:10:00 AM	53100	18.796
1/20/2018	9:15:00 AM	53400	18.843
1/20/2018	9:20:00 AM	53700	18.773
1/20/2018	9:25:00 AM	54000	18.787
1/20/2018	9:30:00 AM	54300	18.756
1/20/2018	9:35:00 AM	54600	18.839
1/20/2018	9:40:00 AM	54900	18.768
1/20/2018	9:45:00 AM	55200	18.778
1/20/2018	9:50:00 AM	55500	18.852
1/20/2018	9:55:00 AM	55800	18.808
1/20/2018	10:00:00 AM	56100	18.777
1/20/2018	10:05:00 AM	56400	18.817
1/20/2018	10:10:00 AM	56700	18.839
1/20/2018	10:15:00 AM	57000	18.809

MW08 Ambient.txt

1/20/2018	10:20:00 AM	57300	18.81
1/20/2018	10:25:00 AM	57600	18.799
1/20/2018	10:30:00 AM	57900	18.768
1/20/2018	10:35:00 AM	58200	18.801
1/20/2018	10:40:00 AM	58500	18.755
1/20/2018	10:45:00 AM	58800	18.855
1/20/2018	10:50:00 AM	59100	18.807
1/20/2018	10:55:00 AM	59400	18.853
1/20/2018	11:00:00 AM	59700	18.807
1/20/2018	11:05:00 AM	60000	18.795
1/20/2018	11:10:00 AM	60300	18.755
1/20/2018	11:15:00 AM	60600	18.831
1/20/2018	11:20:00 AM	60900	18.845
1/20/2018	11:25:00 AM	61200	18.813
1/20/2018	11:30:00 AM	61500	18.801
1/20/2018	11:35:00 AM	61800	18.755
1/20/2018	11:40:00 AM	62100	18.789
1/20/2018	11:45:00 AM	62400	18.791
1/20/2018	11:50:00 AM	62700	18.836
1/20/2018	11:55:00 AM	63000	18.818
1/20/2018	12:00:00 PM	63300	18.774
1/20/2018	12:05:00 PM	63600	18.8
1/20/2018	12:10:00 PM	63900	18.796
1/20/2018	12:15:00 PM	64200	18.836
1/20/2018	12:20:00 PM	64500	18.77
1/20/2018	12:25:00 PM	64800	18.845
1/20/2018	12:30:00 PM	65100	18.828
1/20/2018	12:35:00 PM	65400	18.79
1/20/2018	12:40:00 PM	65700	18.816
1/20/2018	12:45:00 PM	66000	18.812
1/20/2018	12:50:00 PM	66300	18.808
1/20/2018	12:55:00 PM	66600	18.834
1/20/2018	1:00:00 PM	66900	18.829
1/20/2018	1:05:00 PM	67200	18.821
1/20/2018	1:10:00 PM	67500	18.779
1/20/2018	1:15:00 PM	67800	18.824
1/20/2018	1:20:00 PM	68100	18.822
1/20/2018	1:25:00 PM	68400	18.814
1/20/2018	1:30:00 PM	68700	18.817
1/20/2018	1:35:00 PM	69000	18.81
1/20/2018	1:40:00 PM	69300	18.828
1/20/2018	1:45:00 PM	69600	18.833
1/20/2018	1:50:00 PM	69900	18.827
1/20/2018	1:55:00 PM	70200	18.807
1/20/2018	2:00:00 PM	70500	18.785
1/20/2018	2:05:00 PM	70800	18.823
1/20/2018	2:10:00 PM	71100	18.828
1/20/2018	2:15:00 PM	71400	18.858

MW08 Ambient.txt

1/20/2018	2:20:00 PM	71700	18.798
1/20/2018	2:25:00 PM	72000	18.823
1/20/2018	2:30:00 PM	72300	18.835
1/20/2018	2:35:00 PM	72600	18.855
1/20/2018	2:40:00 PM	72900	18.785
1/20/2018	2:45:00 PM	73200	18.835
1/20/2018	2:50:00 PM	73500	18.83
1/20/2018	2:55:00 PM	73800	18.822
1/20/2018	3:00:00 PM	74100	18.838
1/20/2018	3:05:00 PM	74400	18.817
1/20/2018	3:10:00 PM	74700	18.819
1/20/2018	3:15:00 PM	75000	18.715
1/20/2018	3:20:00 PM	75300	18.854
1/20/2018	3:25:00 PM	75600	18.873
1/20/2018	3:30:00 PM	75900	18.82
1/20/2018	3:35:00 PM	76200	18.805
1/20/2018	3:40:00 PM	76500	18.833
1/20/2018	3:45:00 PM	76800	18.808
1/20/2018	3:50:00 PM	77100	18.882
1/20/2018	3:55:00 PM	77400	18.772
1/20/2018	4:00:00 PM	77700	18.857
1/20/2018	4:05:00 PM	78000	18.847
1/20/2018	4:10:00 PM	78300	18.881
1/20/2018	4:15:00 PM	78600	18.847
1/20/2018	4:20:00 PM	78900	18.686
1/20/2018	4:25:00 PM	79200	18.875
1/20/2018	4:30:00 PM	79500	18.932
1/20/2018	4:35:00 PM	79800	18.831
1/20/2018	4:40:00 PM	80100	18.846
1/20/2018	4:45:00 PM	80400	18.893
1/20/2018	4:50:00 PM	80700	18.836
1/20/2018	4:55:00 PM	81000	18.81
1/20/2018	5:00:00 PM	81300	18.901
1/20/2018	5:05:00 PM	81600	18.881
1/20/2018	5:10:00 PM	81900	18.885
1/20/2018	5:15:00 PM	82200	18.881
1/20/2018	5:20:00 PM	82500	18.853
1/20/2018	5:25:00 PM	82800	18.836
1/20/2018	5:30:00 PM	83100	18.826
1/20/2018	5:35:00 PM	83400	18.865
1/20/2018	5:40:00 PM	83700	18.899
1/20/2018	5:45:00 PM	84000	18.877
1/20/2018	5:50:00 PM	84300	18.853
1/20/2018	5:55:00 PM	84600	18.888
1/20/2018	6:00:00 PM	84900	18.883
1/20/2018	6:05:00 PM	85200	18.86
1/20/2018	6:10:00 PM	85500	18.849
1/20/2018	6:15:00 PM	85800	18.867

MW08 Ambient.txt

1/20/2018	6:20:00 PM	86100	18.85
1/20/2018	6:25:00 PM	86400	18.876
1/20/2018	6:30:00 PM	86700	18.861
1/20/2018	6:35:00 PM	87000	18.869
1/20/2018	6:40:00 PM	87300	18.839
1/20/2018	6:45:00 PM	87600	18.847
1/20/2018	6:50:00 PM	87900	18.837
1/20/2018	6:55:00 PM	88200	18.84
1/20/2018	7:00:00 PM	88500	18.853
1/20/2018	7:05:00 PM	88800	18.869
1/20/2018	7:10:00 PM	89100	18.864
1/20/2018	7:15:00 PM	89400	18.858
1/20/2018	7:20:00 PM	89700	18.845
1/20/2018	7:25:00 PM	90000	18.842
1/20/2018	7:30:00 PM	90300	18.856
1/20/2018	7:35:00 PM	90600	18.844
1/20/2018	7:40:00 PM	90900	18.851
1/20/2018	7:45:00 PM	91200	18.864
1/20/2018	7:50:00 PM	91500	18.854
1/20/2018	7:55:00 PM	91800	18.862
1/20/2018	8:00:00 PM	92100	18.857
1/20/2018	8:05:00 PM	92400	18.851
1/20/2018	8:10:00 PM	92700	18.854
1/20/2018	8:15:00 PM	93000	18.849
1/20/2018	8:20:00 PM	93300	18.855
1/20/2018	8:25:00 PM	93600	18.854
1/20/2018	8:30:00 PM	93900	18.857
1/20/2018	8:35:00 PM	94200	18.861
1/20/2018	8:40:00 PM	94500	18.854
1/20/2018	8:45:00 PM	94800	18.853
1/20/2018	8:50:00 PM	95100	18.849
1/20/2018	8:55:00 PM	95400	18.842
1/20/2018	9:00:00 PM	95700	18.855
1/20/2018	9:05:00 PM	96000	18.859
1/20/2018	9:10:00 PM	96300	18.849
1/20/2018	9:15:00 PM	96600	18.848
1/20/2018	9:20:00 PM	96900	18.869
1/20/2018	9:25:00 PM	97200	18.857
1/20/2018	9:30:00 PM	97500	18.851
1/20/2018	9:35:00 PM	97800	18.85
1/20/2018	9:40:00 PM	98100	18.849
1/20/2018	9:45:00 PM	98400	18.855
1/20/2018	9:50:00 PM	98700	18.858
1/20/2018	9:55:00 PM	99000	18.848
1/20/2018	10:00:00 PM	99300	18.859
1/20/2018	10:05:00 PM	99600	18.855
1/20/2018	10:10:00 PM	99900	18.857
1/20/2018	10:15:00 PM	100200	18.856

MW08 Ambient.txt

1/20/2018	10:20:00 PM	100500	18.851
1/20/2018	10:25:00 PM	100800	18.858
1/20/2018	10:30:00 PM	101100	18.853
1/20/2018	10:35:00 PM	101400	18.859
1/20/2018	10:40:00 PM	101700	18.849
1/20/2018	10:45:00 PM	102000	18.859
1/20/2018	10:50:00 PM	102300	18.856
1/20/2018	10:55:00 PM	102600	18.855
1/20/2018	11:00:00 PM	102900	18.856
1/20/2018	11:05:00 PM	103200	18.855
1/20/2018	11:10:00 PM	103500	18.856
1/20/2018	11:15:00 PM	103800	18.851
1/20/2018	11:20:00 PM	104100	18.859
1/20/2018	11:25:00 PM	104400	18.871
1/20/2018	11:30:00 PM	104700	18.862
1/20/2018	11:35:00 PM	105000	18.86
1/20/2018	11:40:00 PM	105300	18.86
1/20/2018	11:45:00 PM	105600	18.856
1/20/2018	11:50:00 PM	105900	18.855
1/20/2018	11:55:00 PM	106200	18.858
1/21/2018	12:00:00 AM	106500	18.856
1/21/2018	12:05:00 AM	106800	18.86
1/21/2018	12:10:00 AM	107100	18.86
1/21/2018	12:15:00 AM	107400	18.859
1/21/2018	12:20:00 AM	107700	18.856
1/21/2018	12:25:00 AM	108000	18.86
1/21/2018	12:30:00 AM	108300	18.862
1/21/2018	12:35:00 AM	108600	18.864
1/21/2018	12:40:00 AM	108900	18.862
1/21/2018	12:45:00 AM	109200	18.856
1/21/2018	12:50:00 AM	109500	18.858
1/21/2018	12:55:00 AM	109800	18.86
1/21/2018	1:00:00 AM	110100	18.854
1/21/2018	1:05:00 AM	110400	18.853
1/21/2018	1:10:00 AM	110700	18.855
1/21/2018	1:15:00 AM	111000	18.86
1/21/2018	1:20:00 AM	111300	18.855
1/21/2018	1:25:00 AM	111600	18.86
1/21/2018	1:30:00 AM	111900	18.855
1/21/2018	1:35:00 AM	112200	18.861
1/21/2018	1:40:00 AM	112500	18.859
1/21/2018	1:45:00 AM	112800	18.857
1/21/2018	1:50:00 AM	113100	18.867
1/21/2018	1:55:00 AM	113400	18.854
1/21/2018	2:00:00 AM	113700	18.857
1/21/2018	2:05:00 AM	114000	18.861
1/21/2018	2:10:00 AM	114300	18.858
1/21/2018	2:15:00 AM	114600	18.858

MW08 Ambient.txt

1/21/2018	2:20:00 AM	114900	18.853
1/21/2018	2:25:00 AM	115200	18.86
1/21/2018	2:30:00 AM	115500	18.863
1/21/2018	2:35:00 AM	115800	18.847
1/21/2018	2:40:00 AM	116100	18.857
1/21/2018	2:45:00 AM	116400	18.859
1/21/2018	2:50:00 AM	116700	18.854
1/21/2018	2:55:00 AM	117000	18.857
1/21/2018	3:00:00 AM	117300	18.857
1/21/2018	3:05:00 AM	117600	18.863
1/21/2018	3:10:00 AM	117900	18.858
1/21/2018	3:15:00 AM	118200	18.858
1/21/2018	3:20:00 AM	118500	18.855
1/21/2018	3:25:00 AM	118800	18.861
1/21/2018	3:30:00 AM	119100	18.866
1/21/2018	3:35:00 AM	119400	18.863
1/21/2018	3:40:00 AM	119700	18.862
1/21/2018	3:45:00 AM	120000	18.862
1/21/2018	3:50:00 AM	120300	18.855
1/21/2018	3:55:00 AM	120600	18.864
1/21/2018	4:00:00 AM	120900	18.862
1/21/2018	4:05:00 AM	121200	18.861
1/21/2018	4:10:00 AM	121500	18.864
1/21/2018	4:15:00 AM	121800	18.86
1/21/2018	4:20:00 AM	122100	18.858
1/21/2018	4:25:00 AM	122400	18.867
1/21/2018	4:30:00 AM	122700	18.863
1/21/2018	4:35:00 AM	123000	18.856
1/21/2018	4:40:00 AM	123300	18.858
1/21/2018	4:45:00 AM	123600	18.865
1/21/2018	4:50:00 AM	123900	18.866
1/21/2018	4:55:00 AM	124200	18.861
1/21/2018	5:00:00 AM	124500	18.858
1/21/2018	5:05:00 AM	124800	18.868
1/21/2018	5:10:00 AM	125100	18.866
1/21/2018	5:15:00 AM	125400	18.865
1/21/2018	5:20:00 AM	125700	18.862
1/21/2018	5:25:00 AM	126000	18.863
1/21/2018	5:30:00 AM	126300	18.862
1/21/2018	5:35:00 AM	126600	18.863
1/21/2018	5:40:00 AM	126900	18.869
1/21/2018	5:45:00 AM	127200	18.868
1/21/2018	5:50:00 AM	127500	18.862
1/21/2018	5:55:00 AM	127800	18.861
1/21/2018	6:00:00 AM	128100	18.865
1/21/2018	6:05:00 AM	128400	18.868
1/21/2018	6:10:00 AM	128700	18.864
1/21/2018	6:15:00 AM	129000	18.87

MW08 Ambient.txt

1/21/2018	6:20:00 AM	129300	18.862
1/21/2018	6:25:00 AM	129600	18.861
1/21/2018	6:30:00 AM	129900	18.872
1/21/2018	6:35:00 AM	130200	18.86
1/21/2018	6:40:00 AM	130500	18.863
1/21/2018	6:45:00 AM	130800	18.867
1/21/2018	6:50:00 AM	131100	18.858
1/21/2018	6:55:00 AM	131400	18.865
1/21/2018	7:00:00 AM	131700	18.865
1/21/2018	7:05:00 AM	132000	18.865
1/21/2018	7:10:00 AM	132300	18.868
1/21/2018	7:15:00 AM	132600	18.863
1/21/2018	7:20:00 AM	132900	18.866
1/21/2018	7:25:00 AM	133200	18.865
1/21/2018	7:30:00 AM	133500	18.866
1/21/2018	7:35:00 AM	133800	18.87
1/21/2018	7:40:00 AM	134100	18.868
1/21/2018	7:45:00 AM	134400	18.864
1/21/2018	7:50:00 AM	134700	18.867
1/21/2018	7:55:00 AM	135000	18.871
1/21/2018	8:00:00 AM	135300	18.856
1/21/2018	8:05:00 AM	135600	18.863
1/21/2018	8:10:00 AM	135900	18.851
1/21/2018	8:15:00 AM	136200	18.86
1/21/2018	8:20:00 AM	136500	18.849
1/21/2018	8:25:00 AM	136800	18.85
1/21/2018	8:30:00 AM	137100	18.867
1/21/2018	8:35:00 AM	137400	18.868
1/21/2018	8:40:00 AM	137700	18.862
1/21/2018	8:45:00 AM	138000	18.869
1/21/2018	8:50:00 AM	138300	18.864
1/21/2018	8:55:00 AM	138600	18.843
1/21/2018	9:00:00 AM	138900	18.848
1/21/2018	9:05:00 AM	139200	18.863
1/21/2018	9:10:00 AM	139500	18.878
1/21/2018	9:15:00 AM	139800	18.86
1/21/2018	9:20:00 AM	140100	18.869
1/21/2018	9:25:00 AM	140400	18.838
1/21/2018	9:30:00 AM	140700	18.846
1/21/2018	9:35:00 AM	141000	18.847
1/21/2018	9:40:00 AM	141300	18.873
1/21/2018	9:45:00 AM	141600	18.857
1/21/2018	9:50:00 AM	141900	18.878
1/21/2018	9:55:00 AM	142200	18.865
1/21/2018	10:00:00 AM	142500	18.857
1/21/2018	10:05:00 AM	142800	18.872
1/21/2018	10:10:00 AM	143100	18.873
1/21/2018	10:15:00 AM	143400	18.849

MW08 Ambient.txt

1/21/2018	10:20:00 AM	143700	18.85
1/21/2018	10:25:00 AM	144000	18.86
1/21/2018	10:30:00 AM	144300	18.855
1/21/2018	10:35:00 AM	144600	18.851
1/21/2018	10:40:00 AM	144900	18.85
1/21/2018	10:45:00 AM	145200	18.872
1/21/2018	10:50:00 AM	145500	18.865
1/21/2018	10:55:00 AM	145800	18.83
1/21/2018	11:00:00 AM	146100	18.879
1/21/2018	11:05:00 AM	146400	18.792
1/21/2018	11:10:00 AM	146700	18.796
1/21/2018	11:15:00 AM	147000	18.766
1/21/2018	11:20:00 AM	147300	18.86
1/21/2018	11:25:00 AM	147600	18.798
1/21/2018	11:30:00 AM	147900	18.877
1/21/2018	11:35:00 AM	148200	18.912
1/21/2018	11:40:00 AM	148500	18.842
1/21/2018	11:45:00 AM	148800	18.847
1/21/2018	11:50:00 AM	149100	18.847
1/21/2018	11:55:00 AM	149400	18.861
1/21/2018	12:00:00 PM	149700	18.819
1/21/2018	12:05:00 PM	150000	18.869
1/21/2018	12:10:00 PM	150300	18.857
1/21/2018	12:15:00 PM	150600	18.896
1/21/2018	12:20:00 PM	150900	18.89
1/21/2018	12:25:00 PM	151200	18.836
1/21/2018	12:30:00 PM	151500	18.868
1/21/2018	12:35:00 PM	151800	18.811
1/21/2018	12:40:00 PM	152100	18.813
1/21/2018	12:45:00 PM	152400	18.806
1/21/2018	12:50:00 PM	152700	18.833
1/21/2018	12:55:00 PM	153000	18.905
1/21/2018	1:00:00 PM	153300	18.83
1/21/2018	1:05:00 PM	153600	18.893
1/21/2018	1:10:00 PM	153900	18.858
1/21/2018	1:15:00 PM	154200	18.879
1/21/2018	1:20:00 PM	154500	18.791
1/21/2018	1:25:00 PM	154800	18.852
1/21/2018	1:30:00 PM	155100	18.884
1/21/2018	1:35:00 PM	155400	18.879
1/21/2018	1:40:00 PM	155700	18.878
1/21/2018	1:45:00 PM	156000	18.737
1/21/2018	1:50:00 PM	156300	18.814
1/21/2018	1:55:00 PM	156600	18.945
1/21/2018	2:00:00 PM	156900	18.887
1/21/2018	2:05:00 PM	157200	18.808
1/21/2018	2:10:00 PM	157500	18.87
1/21/2018	2:15:00 PM	157800	18.88

MW08 Ambient.txt

1/21/2018	2:20:00 PM	158100	18.889
1/21/2018	2:25:00 PM	158400	18.855
1/21/2018	2:30:00 PM	158700	18.865
1/21/2018	2:35:00 PM	159000	18.739
1/21/2018	2:40:00 PM	159300	18.929
1/21/2018	2:45:00 PM	159600	18.863
1/21/2018	2:50:00 PM	159900	18.841
1/21/2018	2:55:00 PM	160200	18.749
1/21/2018	3:00:00 PM	160500	18.932
1/21/2018	3:05:00 PM	160800	18.856
1/21/2018	3:10:00 PM	161100	18.93
1/21/2018	3:15:00 PM	161400	18.874
1/21/2018	3:20:00 PM	161700	18.783
1/21/2018	3:25:00 PM	162000	18.91
1/21/2018	3:30:00 PM	162300	19.016
1/21/2018	3:35:00 PM	162600	18.8
1/21/2018	3:40:00 PM	162900	18.99
1/21/2018	3:45:00 PM	163200	18.889
1/21/2018	3:50:00 PM	163500	18.897
1/21/2018	3:55:00 PM	163800	18.869
1/21/2018	4:00:00 PM	164100	18.955
1/21/2018	4:05:00 PM	164400	18.958
1/21/2018	4:10:00 PM	164700	18.911
1/21/2018	4:15:00 PM	165000	18.925
1/21/2018	4:20:00 PM	165300	18.874
1/21/2018	4:25:00 PM	165600	18.885
1/21/2018	4:30:00 PM	165900	18.887
1/21/2018	4:35:00 PM	166200	18.937
1/21/2018	4:40:00 PM	166500	18.916
1/21/2018	4:45:00 PM	166800	18.922
1/21/2018	4:50:00 PM	167100	18.917
1/21/2018	4:55:00 PM	167400	18.909
1/21/2018	5:00:00 PM	167700	18.912
1/21/2018	5:05:00 PM	168000	18.916
1/21/2018	5:10:00 PM	168300	18.913
1/21/2018	5:15:00 PM	168600	18.915
1/21/2018	5:20:00 PM	168900	18.913
1/21/2018	5:25:00 PM	169200	18.911
1/21/2018	5:30:00 PM	169500	18.919
1/21/2018	5:35:00 PM	169800	18.926
1/21/2018	5:40:00 PM	170100	18.908
1/21/2018	5:45:00 PM	170400	18.925
1/21/2018	5:50:00 PM	170700	18.923
1/21/2018	5:55:00 PM	171000	18.911
1/21/2018	6:00:00 PM	171300	18.919
1/21/2018	6:05:00 PM	171600	18.919
1/21/2018	6:10:00 PM	171900	18.909
1/21/2018	6:15:00 PM	172200	18.921

MW08 Ambient.txt

1/21/2018	6:20:00 PM	172500	18.918
1/21/2018	6:25:00 PM	172800	18.929
1/21/2018	6:30:00 PM	173100	18.923
1/21/2018	6:35:00 PM	173400	18.911
1/21/2018	6:40:00 PM	173700	18.916
1/21/2018	6:45:00 PM	174000	18.932
1/21/2018	6:50:00 PM	174300	18.927
1/21/2018	6:55:00 PM	174600	18.914
1/21/2018	7:00:00 PM	174900	18.91
1/21/2018	7:05:00 PM	175200	18.932
1/21/2018	7:10:00 PM	175500	18.937
1/21/2018	7:15:00 PM	175800	18.936
1/21/2018	7:20:00 PM	176100	18.919
1/21/2018	7:25:00 PM	176400	18.908
1/21/2018	7:30:00 PM	176700	18.908
1/21/2018	7:35:00 PM	177000	18.923
1/21/2018	7:40:00 PM	177300	18.917
1/21/2018	7:45:00 PM	177600	18.919
1/21/2018	7:50:00 PM	177900	18.916
1/21/2018	7:55:00 PM	178200	18.918
1/21/2018	8:00:00 PM	178500	18.922
1/21/2018	8:05:00 PM	178800	18.935
1/21/2018	8:10:00 PM	179100	18.935
1/21/2018	8:15:00 PM	179400	18.939
1/21/2018	8:20:00 PM	179700	18.927
1/21/2018	8:25:00 PM	180000	18.922
1/21/2018	8:30:00 PM	180300	18.93
1/21/2018	8:35:00 PM	180600	18.933
1/21/2018	8:40:00 PM	180900	18.927
1/21/2018	8:45:00 PM	181200	18.917
1/21/2018	8:50:00 PM	181500	18.913
1/21/2018	8:55:00 PM	181800	18.922
1/21/2018	9:00:00 PM	182100	18.92
1/21/2018	9:05:00 PM	182400	18.932
1/21/2018	9:10:00 PM	182700	18.933
1/21/2018	9:15:00 PM	183000	18.933
1/21/2018	9:20:00 PM	183300	18.923
1/21/2018	9:25:00 PM	183600	18.939
1/21/2018	9:30:00 PM	183900	18.94
1/21/2018	9:35:00 PM	184200	18.924
1/21/2018	9:40:00 PM	184500	18.93
1/21/2018	9:45:00 PM	184800	18.934
1/21/2018	9:50:00 PM	185100	18.938
1/21/2018	9:55:00 PM	185400	18.928
1/21/2018	10:00:00 PM	185700	18.934
1/21/2018	10:05:00 PM	186000	18.932
1/21/2018	10:10:00 PM	186300	18.938
1/21/2018	10:15:00 PM	186600	18.948

MW08 Ambient.txt

1/21/2018	10:20:00 PM	186900	18.959
1/21/2018	10:25:00 PM	187200	18.94
1/21/2018	10:30:00 PM	187500	18.934
1/21/2018	10:35:00 PM	187800	18.939
1/21/2018	10:40:00 PM	188100	18.928
1/21/2018	10:45:00 PM	188400	18.937
1/21/2018	10:50:00 PM	188700	18.936
1/21/2018	10:55:00 PM	189000	18.942
1/21/2018	11:00:00 PM	189300	18.936
1/21/2018	11:05:00 PM	189600	18.94
1/21/2018	11:10:00 PM	189900	18.94
1/21/2018	11:15:00 PM	190200	18.943
1/21/2018	11:20:00 PM	190500	18.938
1/21/2018	11:25:00 PM	190800	18.967
1/21/2018	11:30:00 PM	191100	18.939
1/21/2018	11:35:00 PM	191400	18.945
1/21/2018	11:40:00 PM	191700	18.964
1/21/2018	11:45:00 PM	192000	18.945
1/21/2018	11:50:00 PM	192300	18.947
1/21/2018	11:55:00 PM	192600	18.953
1/22/2018	12:00:00 AM	192900	18.95
1/22/2018	12:05:00 AM	193200	18.95
1/22/2018	12:10:00 AM	193500	18.946
1/22/2018	12:15:00 AM	193800	18.953
1/22/2018	12:20:00 AM	194100	18.946
1/22/2018	12:25:00 AM	194400	18.972
1/22/2018	12:30:00 AM	194700	18.96
1/22/2018	12:35:00 AM	195000	18.982
1/22/2018	12:40:00 AM	195300	18.977
1/22/2018	12:45:00 AM	195600	18.963
1/22/2018	12:50:00 AM	195900	18.966
1/22/2018	12:55:00 AM	196200	18.969
1/22/2018	1:00:00 AM	196500	18.982
1/22/2018	1:05:00 AM	196800	18.983
1/22/2018	1:10:00 AM	197100	18.972
1/22/2018	1:15:00 AM	197400	18.969
1/22/2018	1:20:00 AM	197700	18.949
1/22/2018	1:25:00 AM	198000	18.965
1/22/2018	1:30:00 AM	198300	18.968
1/22/2018	1:35:00 AM	198600	18.946
1/22/2018	1:40:00 AM	198900	18.968
1/22/2018	1:45:00 AM	199200	19.007
1/22/2018	1:50:00 AM	199500	18.982
1/22/2018	1:55:00 AM	199800	18.973
1/22/2018	2:00:00 AM	200100	18.978
1/22/2018	2:05:00 AM	200400	18.97
1/22/2018	2:10:00 AM	200700	18.976
1/22/2018	2:15:00 AM	201000	18.973

MW08 Ambient.txt

1/22/2018	2:20:00 AM	201300	18.993
1/22/2018	2:25:00 AM	201600	18.983
1/22/2018	2:30:00 AM	201900	18.996
1/22/2018	2:35:00 AM	202200	18.988
1/22/2018	2:40:00 AM	202500	18.992
1/22/2018	2:45:00 AM	202800	18.98
1/22/2018	2:50:00 AM	203100	18.963
1/22/2018	2:55:00 AM	203400	18.973
1/22/2018	3:00:00 AM	203700	18.962
1/22/2018	3:05:00 AM	204000	18.987
1/22/2018	3:10:00 AM	204300	18.98
1/22/2018	3:15:00 AM	204600	18.981
1/22/2018	3:20:00 AM	204900	18.984
1/22/2018	3:25:00 AM	205200	18.984
1/22/2018	3:30:00 AM	205500	18.979
1/22/2018	3:35:00 AM	205800	18.98
1/22/2018	3:40:00 AM	206100	18.984
1/22/2018	3:45:00 AM	206400	18.963
1/22/2018	3:50:00 AM	206700	18.979
1/22/2018	3:55:00 AM	207000	18.983
1/22/2018	4:00:00 AM	207300	18.972
1/22/2018	4:05:00 AM	207600	18.96
1/22/2018	4:10:00 AM	207900	18.909
1/22/2018	4:15:00 AM	208200	18.964
1/22/2018	4:20:00 AM	208500	18.98
1/22/2018	4:25:00 AM	208800	18.996
1/22/2018	4:30:00 AM	209100	18.983
1/22/2018	4:35:00 AM	209400	18.986
1/22/2018	4:40:00 AM	209700	18.976
1/22/2018	4:45:00 AM	210000	18.973
1/22/2018	4:50:00 AM	210300	18.971
1/22/2018	4:55:00 AM	210600	18.965
1/22/2018	5:00:00 AM	210900	18.96
1/22/2018	5:05:00 AM	211200	18.968
1/22/2018	5:10:00 AM	211500	18.952
1/22/2018	5:15:00 AM	211800	18.959
1/22/2018	5:20:00 AM	212100	18.955
1/22/2018	5:25:00 AM	212400	18.966
1/22/2018	5:30:00 AM	212700	18.975
1/22/2018	5:35:00 AM	213000	18.964
1/22/2018	5:40:00 AM	213300	18.964
1/22/2018	5:45:00 AM	213600	18.964
1/22/2018	5:50:00 AM	213900	18.951
1/22/2018	5:55:00 AM	214200	18.958
1/22/2018	6:00:00 AM	214500	18.959
1/22/2018	6:05:00 AM	214800	18.953
1/22/2018	6:10:00 AM	215100	18.952
1/22/2018	6:15:00 AM	215400	18.948

MW08 Ambient.txt

1/22/2018	6:20:00 AM	215700	18.955
1/22/2018	6:25:00 AM	216000	18.95
1/22/2018	6:30:00 AM	216300	18.942
1/22/2018	6:35:00 AM	216600	18.956
1/22/2018	6:40:00 AM	216900	18.954
1/22/2018	6:45:00 AM	217200	18.953
1/22/2018	6:50:00 AM	217500	18.944
1/22/2018	6:55:00 AM	217800	18.945
1/22/2018	7:00:00 AM	218100	18.941
1/22/2018	7:05:00 AM	218400	18.938
1/22/2018	7:10:00 AM	218700	18.941
1/22/2018	7:15:00 AM	219000	18.938
1/22/2018	7:20:00 AM	219300	18.932
1/22/2018	7:25:00 AM	219600	18.934
1/22/2018	7:30:00 AM	219900	18.927
1/22/2018	7:35:00 AM	220200	18.922
1/22/2018	7:40:00 AM	220500	18.923
1/22/2018	7:45:00 AM	220800	18.919
1/22/2018	7:50:00 AM	221100	18.919
1/22/2018	7:55:00 AM	221400	18.917
1/22/2018	8:00:00 AM	221700	18.921
1/22/2018	8:05:00 AM	222000	18.916
1/22/2018	8:10:00 AM	222300	18.916
1/22/2018	8:15:00 AM	222600	18.905
1/22/2018	8:20:00 AM	222900	18.904
1/22/2018	8:25:00 AM	223200	18.904
1/22/2018	8:30:00 AM	223500	18.901
1/22/2018	8:35:00 AM	223800	18.89
1/22/2018	8:40:00 AM	224100	18.875
1/22/2018	8:45:00 AM	224400	18.869
1/22/2018	8:50:00 AM	224700	18.872
1/22/2018	8:55:00 AM	225000	18.858
1/22/2018	9:00:00 AM	225300	18.888
1/22/2018	9:05:00 AM	225600	18.867
1/22/2018	9:10:00 AM	225900	18.886
1/22/2018	9:15:00 AM	226200	18.855
1/22/2018	9:20:00 AM	226500	18.892
1/22/2018	9:25:00 AM	226800	18.881
1/22/2018	9:30:00 AM	227100	18.843
1/22/2018	9:35:00 AM	227400	18.856
1/22/2018	9:40:00 AM	227700	18.849
1/22/2018	9:45:00 AM	228000	18.899
1/22/2018	9:50:00 AM	228300	18.832
1/22/2018	9:55:00 AM	228600	18.81
1/22/2018	10:00:00 AM	228900	18.822
1/22/2018	10:05:00 AM	229200	18.87
1/22/2018	10:10:00 AM	229500	18.862
1/22/2018	10:15:00 AM	229800	18.808

MW08 Ambient.txt			
1/22/2018	10:20:00 AM	230100	18.872
1/22/2018	10:25:00 AM	230400	18.832
1/22/2018	10:30:00 AM	230700	18.928
1/22/2018	10:35:00 AM	231000	18.881
1/22/2018	10:40:00 AM	231300	18.82

CONSTANT RATE TEST DATA

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/23/2018	4:34:01 PM	0	9.38
1/23/2018	4:39:01 PM	300	9.39
1/23/2018	4:44:01 PM	600	9.41
1/23/2018	4:49:01 PM	900	9.42
1/23/2018	4:54:01 PM	1200	9.44
1/23/2018	4:59:01 PM	1500	9.45
1/23/2018	5:04:01 PM	1800	9.47
1/23/2018	5:09:01 PM	2100	9.47
1/23/2018	5:14:01 PM	2400	9.48
1/23/2018	5:19:01 PM	2700	9.49
1/23/2018	5:24:01 PM	3000	9.49
1/23/2018	5:29:01 PM	3300	9.5
1/23/2018	5:34:01 PM	3600	9.51
1/23/2018	5:39:01 PM	3900	9.52
1/23/2018	5:44:01 PM	4200	9.52
1/23/2018	5:49:01 PM	4500	9.53
1/23/2018	5:54:01 PM	4800	9.54
1/23/2018	5:59:01 PM	5100	9.54
1/23/2018	6:04:01 PM	5400	9.54
1/23/2018	6:09:01 PM	5700	9.55
1/23/2018	6:14:01 PM	6000	9.55
1/23/2018	6:19:01 PM	6300	9.56
1/23/2018	6:24:01 PM	6600	9.56
1/23/2018	6:29:01 PM	6900	9.56
1/23/2018	6:34:01 PM	7200	9.56
1/23/2018	6:39:01 PM	7500	9.56
1/23/2018	6:44:01 PM	7800	9.57
1/23/2018	6:49:01 PM	8100	9.57
1/23/2018	6:54:01 PM	8400	9.57
1/23/2018	6:59:01 PM	8700	9.57
1/23/2018	7:04:01 PM	9000	9.58
1/23/2018	7:09:01 PM	9300	9.58
1/23/2018	7:14:01 PM	9600	9.58
1/23/2018	7:19:01 PM	9900	9.58
1/23/2018	7:24:01 PM	10200	9.58
1/23/2018	7:29:01 PM	10500	9.59
1/23/2018	7:34:01 PM	10800	9.59
1/23/2018	7:39:01 PM	11100	9.59
1/23/2018	7:44:01 PM	11400	9.59
1/23/2018	7:49:01 PM	11700	9.59
1/23/2018	7:54:01 PM	12000	9.59
1/23/2018	7:59:01 PM	12300	9.59
1/23/2018	8:04:01 PM	12600	9.6
1/23/2018	8:09:01 PM	12900	9.6
1/23/2018	8:14:01 PM	13200	9.6

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/23/2018	8:19:01 PM	13500	9.6
1/23/2018	8:24:01 PM	13800	9.6
1/23/2018	8:29:01 PM	14100	9.6
1/23/2018	8:34:01 PM	14400	9.61
1/23/2018	8:39:01 PM	14700	9.6
1/23/2018	8:44:01 PM	15000	9.6
1/23/2018	8:49:01 PM	15300	9.61
1/23/2018	8:54:01 PM	15600	9.61
1/23/2018	8:59:01 PM	15900	9.61
1/23/2018	9:04:01 PM	16200	9.61
1/23/2018	9:09:01 PM	16500	9.61
1/23/2018	9:14:01 PM	16800	9.61
1/23/2018	9:19:01 PM	17100	9.61
1/23/2018	9:24:01 PM	17400	9.61
1/23/2018	9:29:01 PM	17700	9.61
1/23/2018	9:34:01 PM	18000	9.61
1/23/2018	9:39:01 PM	18300	9.62
1/23/2018	9:44:01 PM	18600	9.62
1/23/2018	9:49:01 PM	18900	9.61
1/23/2018	9:54:01 PM	19200	9.62
1/23/2018	9:59:01 PM	19500	9.62
1/23/2018	10:04:01 PM	19800	9.62
1/23/2018	10:09:01 PM	20100	9.62
1/23/2018	10:14:01 PM	20400	9.62
1/23/2018	10:19:01 PM	20700	9.62
1/23/2018	10:24:01 PM	21000	9.62
1/23/2018	10:29:01 PM	21300	9.62
1/23/2018	10:34:01 PM	21600	9.62
1/23/2018	10:39:01 PM	21900	9.62
1/23/2018	10:44:01 PM	22200	9.62
1/23/2018	10:49:01 PM	22500	9.62
1/23/2018	10:54:01 PM	22800	9.62
1/23/2018	10:59:01 PM	23100	9.62
1/23/2018	11:04:01 PM	23400	9.62
1/23/2018	11:09:01 PM	23700	9.62
1/23/2018	11:14:01 PM	24000	9.62
1/23/2018	11:19:01 PM	24300	9.63
1/23/2018	11:24:01 PM	24600	9.62
1/23/2018	11:29:01 PM	24900	9.63
1/23/2018	11:34:01 PM	25200	9.63
1/23/2018	11:39:01 PM	25500	9.63
1/23/2018	11:44:01 PM	25800	9.63
1/23/2018	11:49:01 PM	26100	9.63
1/23/2018	11:54:01 PM	26400	9.63
1/23/2018	11:59:01 PM	26700	9.63

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/24/2018	12:04:01 AM	27000	9.63
1/24/2018	12:09:01 AM	27300	9.63
1/24/2018	12:14:01 AM	27600	9.64
1/24/2018	12:19:01 AM	27900	9.63
1/24/2018	12:24:01 AM	28200	9.63
1/24/2018	12:29:01 AM	28500	9.63
1/24/2018	12:34:01 AM	28800	9.63
1/24/2018	12:39:01 AM	29100	9.64
1/24/2018	12:44:01 AM	29400	9.64
1/24/2018	12:49:01 AM	29700	9.63
1/24/2018	12:54:01 AM	30000	9.64
1/24/2018	12:59:01 AM	30300	9.64
1/24/2018	1:04:01 AM	30600	9.64
1/24/2018	1:09:01 AM	30900	9.64
1/24/2018	1:14:01 AM	31200	9.64
1/24/2018	1:19:01 AM	31500	9.64
1/24/2018	1:24:01 AM	31800	9.64
1/24/2018	1:29:01 AM	32100	9.64
1/24/2018	1:34:01 AM	32400	9.64
1/24/2018	1:39:01 AM	32700	9.64
1/24/2018	1:44:01 AM	33000	9.64
1/24/2018	1:49:01 AM	33300	9.64
1/24/2018	1:54:01 AM	33600	9.64
1/24/2018	1:59:01 AM	33900	9.64
1/24/2018	2:04:01 AM	34200	9.65
1/24/2018	2:09:01 AM	34500	9.65
1/24/2018	2:14:01 AM	34800	9.65
1/24/2018	2:19:01 AM	35100	9.65
1/24/2018	2:24:01 AM	35400	9.65
1/24/2018	2:29:01 AM	35700	9.65
1/24/2018	2:34:01 AM	36000	9.65
1/24/2018	2:39:01 AM	36300	9.66
1/24/2018	2:44:01 AM	36600	9.65
1/24/2018	2:49:01 AM	36900	9.66
1/24/2018	2:54:01 AM	37200	9.66
1/24/2018	2:59:01 AM	37500	9.66
1/24/2018	3:04:01 AM	37800	9.66
1/24/2018	3:09:01 AM	38100	9.66
1/24/2018	3:14:01 AM	38400	9.66
1/24/2018	3:19:01 AM	38700	9.66
1/24/2018	3:24:01 AM	39000	9.66
1/24/2018	3:29:01 AM	39300	9.66
1/24/2018	3:34:01 AM	39600	9.67
1/24/2018	3:39:01 AM	39900	9.67
1/24/2018	3:44:01 AM	40200	9.66

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/24/2018	3:49:01 AM	40500	9.67
1/24/2018	3:54:01 AM	40800	9.67
1/24/2018	3:59:01 AM	41100	9.66
1/24/2018	4:04:01 AM	41400	9.67
1/24/2018	4:09:01 AM	41700	9.67
1/24/2018	4:14:01 AM	42000	9.67
1/24/2018	4:19:01 AM	42300	9.67
1/24/2018	4:24:01 AM	42600	9.67
1/24/2018	4:29:01 AM	42900	9.67
1/24/2018	4:34:01 AM	43200	9.67
1/24/2018	4:39:01 AM	43500	9.67
1/24/2018	4:44:01 AM	43800	9.67
1/24/2018	4:49:01 AM	44100	9.67
1/24/2018	4:54:01 AM	44400	9.67
1/24/2018	4:59:01 AM	44700	9.67
1/24/2018	5:04:01 AM	45000	9.67
1/24/2018	5:09:01 AM	45300	9.67
1/24/2018	5:14:01 AM	45600	9.67
1/24/2018	5:19:01 AM	45900	9.67
1/24/2018	5:24:01 AM	46200	9.67
1/24/2018	5:29:01 AM	46500	9.67
1/24/2018	5:34:01 AM	46800	9.68
1/24/2018	5:39:01 AM	47100	9.67
1/24/2018	5:44:01 AM	47400	9.67
1/24/2018	5:49:01 AM	47700	9.68
1/24/2018	5:54:01 AM	48000	9.68
1/24/2018	5:59:01 AM	48300	9.68
1/24/2018	6:04:01 AM	48600	9.68
1/24/2018	6:09:01 AM	48900	9.68
1/24/2018	6:14:01 AM	49200	9.68
1/24/2018	6:19:01 AM	49500	9.68
1/24/2018	6:24:01 AM	49800	9.68
1/24/2018	6:29:01 AM	50100	9.68
1/24/2018	6:34:01 AM	50400	9.68
1/24/2018	6:39:01 AM	50700	9.68
1/24/2018	6:44:01 AM	51000	9.68
1/24/2018	6:49:01 AM	51300	9.68
1/24/2018	6:54:01 AM	51600	9.68
1/24/2018	6:59:01 AM	51900	9.68
1/24/2018	7:04:01 AM	52200	9.69
1/24/2018	7:09:01 AM	52500	9.69
1/24/2018	7:14:01 AM	52800	9.68
1/24/2018	7:19:01 AM	53100	9.69
1/24/2018	7:24:01 AM	53400	9.69
1/24/2018	7:29:01 AM	53700	9.69

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/24/2018	7:34:01 AM	54000	9.69
1/24/2018	7:39:01 AM	54300	9.69
1/24/2018	7:44:01 AM	54600	9.69
1/24/2018	7:49:01 AM	54900	9.69
1/24/2018	7:54:01 AM	55200	9.69
1/24/2018	7:59:01 AM	55500	9.7
1/24/2018	8:04:01 AM	55800	9.7
1/24/2018	8:09:01 AM	56100	9.7
1/24/2018	8:14:01 AM	56400	9.7
1/24/2018	8:19:01 AM	56700	9.7
1/24/2018	8:24:01 AM	57000	9.7
1/24/2018	8:29:01 AM	57300	9.7
1/24/2018	8:34:01 AM	57600	9.7
1/24/2018	8:39:01 AM	57900	9.7
1/24/2018	8:44:01 AM	58200	9.7
1/24/2018	8:49:01 AM	58500	9.7
1/24/2018	8:54:01 AM	58800	9.7
1/24/2018	8:59:01 AM	59100	9.7
1/24/2018	9:04:01 AM	59400	9.71
1/24/2018	9:09:01 AM	59700	9.71
1/24/2018	9:14:01 AM	60000	9.7
1/24/2018	9:19:01 AM	60300	9.71
1/24/2018	9:24:01 AM	60600	9.71
1/24/2018	9:29:01 AM	60900	9.71
1/24/2018	9:34:01 AM	61200	9.71
1/24/2018	9:39:01 AM	61500	9.71
1/24/2018	9:44:01 AM	61800	9.71
1/24/2018	9:49:01 AM	62100	9.71
1/24/2018	9:54:01 AM	62400	9.71
1/24/2018	9:59:01 AM	62700	9.71
1/24/2018	10:04:01 AM	63000	9.71
1/24/2018	10:09:01 AM	63300	9.71
1/24/2018	10:14:01 AM	63600	9.71
1/24/2018	10:19:01 AM	63900	9.71
1/24/2018	10:24:01 AM	64200	9.71
1/24/2018	10:29:01 AM	64500	9.71
1/24/2018	10:34:01 AM	64800	9.71
1/24/2018	10:39:01 AM	65100	9.71
1/24/2018	10:44:01 AM	65400	9.71
1/24/2018	10:49:01 AM	65700	9.71
1/24/2018	10:54:01 AM	66000	9.71
1/24/2018	10:59:01 AM	66300	9.7
1/24/2018	11:04:01 AM	66600	9.71
1/24/2018	11:09:01 AM	66900	9.7
1/24/2018	11:14:01 AM	67200	9.71

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/24/2018	11:19:01 AM	67500	9.7
1/24/2018	11:24:01 AM	67800	9.7
1/24/2018	11:29:01 AM	68100	9.7
1/24/2018	11:34:01 AM	68400	9.7
1/24/2018	11:39:01 AM	68700	9.7
1/24/2018	11:44:01 AM	69000	9.7
1/24/2018	11:49:01 AM	69300	9.7
1/24/2018	11:54:01 AM	69600	9.69
1/24/2018	11:59:01 AM	69900	9.71
1/24/2018	12:04:01 PM	70200	9.7
1/24/2018	12:09:01 PM	70500	9.7
1/24/2018	12:14:01 PM	70800	9.69
1/24/2018	12:19:01 PM	71100	9.68
1/24/2018	12:24:01 PM	71400	9.68
1/24/2018	12:29:01 PM	71700	9.68
1/24/2018	12:34:01 PM	72000	9.68
1/24/2018	12:39:01 PM	72300	9.68
1/24/2018	12:44:01 PM	72600	9.68
1/24/2018	12:49:01 PM	72900	9.68
1/24/2018	12:54:01 PM	73200	9.67
1/24/2018	12:59:01 PM	73500	9.68
1/24/2018	1:04:01 PM	73800	9.68
1/24/2018	1:09:01 PM	74100	9.68
1/24/2018	1:14:01 PM	74400	9.68
1/24/2018	1:19:01 PM	74700	9.68
1/24/2018	1:24:01 PM	75000	9.68
1/24/2018	1:29:01 PM	75300	9.68
1/24/2018	1:34:01 PM	75600	9.67
1/24/2018	1:39:01 PM	75900	9.68
1/24/2018	1:44:01 PM	76200	9.68
1/24/2018	1:49:01 PM	76500	9.68
1/24/2018	1:54:01 PM	76800	9.67
1/24/2018	1:59:01 PM	77100	9.67
1/24/2018	2:04:01 PM	77400	9.67
1/24/2018	2:09:01 PM	77700	9.67
1/24/2018	2:14:01 PM	78000	9.67
1/24/2018	2:19:01 PM	78300	9.67
1/24/2018	2:24:01 PM	78600	9.67
1/24/2018	2:29:01 PM	78900	9.67
1/24/2018	2:34:01 PM	79200	9.67
1/24/2018	2:39:01 PM	79500	9.67
1/24/2018	2:44:01 PM	79800	9.67
1/24/2018	2:49:01 PM	80100	9.67
1/24/2018	2:54:01 PM	80400	9.67
1/24/2018	2:59:01 PM	80700	9.67

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/24/2018	3:04:01 PM	81000	9.67
1/24/2018	3:09:01 PM	81300	9.66
1/24/2018	3:14:01 PM	81600	9.67
1/24/2018	3:19:01 PM	81900	9.67
1/24/2018	3:24:01 PM	82200	9.67
1/24/2018	3:29:01 PM	82500	9.67
1/24/2018	3:34:01 PM	82800	9.67
1/24/2018	3:39:01 PM	83100	9.67
1/24/2018	3:44:01 PM	83400	9.67
1/24/2018	3:49:01 PM	83700	9.67
1/24/2018	3:54:01 PM	84000	9.68
1/24/2018	3:59:01 PM	84300	9.67
1/24/2018	4:04:01 PM	84600	9.67
1/24/2018	4:09:01 PM	84900	9.67
1/24/2018	4:14:01 PM	85200	9.68
1/24/2018	4:19:01 PM	85500	9.67
1/24/2018	4:24:01 PM	85800	9.67
1/24/2018	4:29:01 PM	86100	9.67
1/24/2018	4:34:01 PM	86400	9.67
1/24/2018	4:39:01 PM	86700	9.67
1/24/2018	4:44:01 PM	87000	9.67
1/24/2018	4:49:01 PM	87300	9.67
1/24/2018	4:54:01 PM	87600	9.67
1/24/2018	4:59:01 PM	87900	9.68
1/24/2018	5:04:01 PM	88200	9.67
1/24/2018	5:09:01 PM	88500	9.68
1/24/2018	5:14:01 PM	88800	9.68
1/24/2018	5:19:01 PM	89100	9.68
1/24/2018	5:24:01 PM	89400	9.68
1/24/2018	5:29:01 PM	89700	9.68
1/24/2018	5:34:01 PM	90000	9.68
1/24/2018	5:39:01 PM	90300	9.68
1/24/2018	5:44:01 PM	90600	9.68
1/24/2018	5:49:01 PM	90900	9.68
1/24/2018	5:54:01 PM	91200	9.68
1/24/2018	5:59:01 PM	91500	9.68
1/24/2018	6:04:01 PM	91800	9.69
1/24/2018	6:09:01 PM	92100	9.69
1/24/2018	6:14:01 PM	92400	9.69
1/24/2018	6:19:01 PM	92700	9.68
1/24/2018	6:24:01 PM	93000	9.69
1/24/2018	6:29:01 PM	93300	9.69
1/24/2018	6:34:01 PM	93600	9.69
1/24/2018	6:39:01 PM	93900	9.69
1/24/2018	6:44:01 PM	94200	9.69

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/24/2018	6:49:01 PM	94500	9.69
1/24/2018	6:54:01 PM	94800	9.69
1/24/2018	6:59:01 PM	95100	9.69
1/24/2018	7:04:01 PM	95400	9.69
1/24/2018	7:09:01 PM	95700	9.69
1/24/2018	7:14:01 PM	96000	9.69
1/24/2018	7:19:01 PM	96300	9.69
1/24/2018	7:24:01 PM	96600	9.69
1/24/2018	7:29:01 PM	96900	9.69
1/24/2018	7:34:01 PM	97200	9.7
1/24/2018	7:39:01 PM	97500	9.69
1/24/2018	7:44:01 PM	97800	9.69
1/24/2018	7:49:01 PM	98100	9.7
1/24/2018	7:54:01 PM	98400	9.7
1/24/2018	7:59:01 PM	98700	9.7
1/24/2018	8:04:01 PM	99000	9.69
1/24/2018	8:09:01 PM	99300	9.69
1/24/2018	8:14:01 PM	99600	9.69
1/24/2018	8:19:01 PM	99900	9.69
1/24/2018	8:24:01 PM	100200	9.68
1/24/2018	8:29:01 PM	100500	9.69
1/24/2018	8:34:01 PM	100800	9.69
1/24/2018	8:39:01 PM	101100	9.68
1/24/2018	8:44:01 PM	101400	9.69
1/24/2018	8:49:01 PM	101700	9.69
1/24/2018	8:54:01 PM	102000	9.69
1/24/2018	8:59:01 PM	102300	9.69
1/24/2018	9:04:01 PM	102600	9.69
1/24/2018	9:09:01 PM	102900	9.69
1/24/2018	9:14:01 PM	103200	9.69
1/24/2018	9:19:01 PM	103500	9.69
1/24/2018	9:24:01 PM	103800	9.7
1/24/2018	9:29:01 PM	104100	9.7
1/24/2018	9:34:01 PM	104400	9.7
1/24/2018	9:39:01 PM	104700	9.7
1/24/2018	9:44:01 PM	105000	9.7
1/24/2018	9:49:01 PM	105300	9.7
1/24/2018	9:54:01 PM	105600	9.7
1/24/2018	9:59:01 PM	105900	9.7
1/24/2018	10:04:01 PM	106200	9.7
1/24/2018	10:09:01 PM	106500	9.7
1/24/2018	10:14:01 PM	106800	9.7
1/24/2018	10:19:01 PM	107100	9.7
1/24/2018	10:24:01 PM	107400	9.7
1/24/2018	10:29:01 PM	107700	9.7

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/24/2018	10:34:01 PM	108000	9.7
1/24/2018	10:39:01 PM	108300	9.7
1/24/2018	10:44:01 PM	108600	9.7
1/24/2018	10:49:01 PM	108900	9.7
1/24/2018	10:54:01 PM	109200	9.7
1/24/2018	10:59:01 PM	109500	9.7
1/24/2018	11:04:01 PM	109800	9.7
1/24/2018	11:09:01 PM	110100	9.7
1/24/2018	11:14:01 PM	110400	9.7
1/24/2018	11:19:01 PM	110700	9.7
1/24/2018	11:24:01 PM	111000	9.7
1/24/2018	11:29:01 PM	111300	9.7
1/24/2018	11:34:01 PM	111600	9.7
1/24/2018	11:39:01 PM	111900	9.7
1/24/2018	11:44:01 PM	112200	9.7
1/24/2018	11:49:01 PM	112500	9.71
1/24/2018	11:54:01 PM	112800	9.71
1/24/2018	11:59:01 PM	113100	9.7
1/25/2018	12:04:01 AM	113400	9.7
1/25/2018	12:09:01 AM	113700	9.7
1/25/2018	12:14:01 AM	114000	9.7
1/25/2018	12:19:01 AM	114300	9.7
1/25/2018	12:24:01 AM	114600	9.7
1/25/2018	12:29:01 AM	114900	9.7
1/25/2018	12:34:01 AM	115200	9.7
1/25/2018	12:39:01 AM	115500	9.7
1/25/2018	12:44:01 AM	115800	9.7
1/25/2018	12:49:01 AM	116100	9.7
1/25/2018	12:54:01 AM	116400	9.7
1/25/2018	12:59:01 AM	116700	9.7
1/25/2018	1:04:01 AM	117000	9.7
1/25/2018	1:09:01 AM	117300	9.7
1/25/2018	1:14:01 AM	117600	9.7
1/25/2018	1:19:01 AM	117900	9.7
1/25/2018	1:24:01 AM	118200	9.7
1/25/2018	1:29:01 AM	118500	9.7
1/25/2018	1:34:01 AM	118800	9.7
1/25/2018	1:39:01 AM	119100	9.7
1/25/2018	1:44:01 AM	119400	9.7
1/25/2018	1:49:01 AM	119700	9.7
1/25/2018	1:54:01 AM	120000	9.7
1/25/2018	1:59:01 AM	120300	9.7
1/25/2018	2:04:01 AM	120600	9.7
1/25/2018	2:09:01 AM	120900	9.7
1/25/2018	2:14:01 AM	121200	9.7

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/25/2018	2:19:01 AM	121500	9.7
1/25/2018	2:24:01 AM	121800	9.7
1/25/2018	2:29:01 AM	122100	9.7
1/25/2018	2:34:01 AM	122400	9.7
1/25/2018	2:39:01 AM	122700	9.7
1/25/2018	2:44:01 AM	123000	9.7
1/25/2018	2:49:01 AM	123300	9.7
1/25/2018	2:54:01 AM	123600	9.7
1/25/2018	2:59:01 AM	123900	9.69
1/25/2018	3:04:01 AM	124200	9.7
1/25/2018	3:09:01 AM	124500	9.69
1/25/2018	3:14:01 AM	124800	9.7
1/25/2018	3:19:01 AM	125100	9.69
1/25/2018	3:24:01 AM	125400	9.7
1/25/2018	3:29:01 AM	125700	9.7
1/25/2018	3:34:01 AM	126000	9.7
1/25/2018	3:39:01 AM	126300	9.69
1/25/2018	3:44:01 AM	126600	9.7
1/25/2018	3:49:01 AM	126900	9.7
1/25/2018	3:54:01 AM	127200	9.7
1/25/2018	3:59:01 AM	127500	9.7
1/25/2018	4:04:01 AM	127800	9.7
1/25/2018	4:09:01 AM	128100	9.7
1/25/2018	4:14:01 AM	128400	9.7
1/25/2018	4:19:01 AM	128700	9.7
1/25/2018	4:24:01 AM	129000	9.7
1/25/2018	4:29:01 AM	129300	9.7
1/25/2018	4:34:01 AM	129600	9.7
1/25/2018	4:39:01 AM	129900	9.69
1/25/2018	4:44:01 AM	130200	9.7
1/25/2018	4:49:01 AM	130500	9.7
1/25/2018	4:54:01 AM	130800	9.69
1/25/2018	4:59:01 AM	131100	9.7
1/25/2018	5:04:01 AM	131400	9.7
1/25/2018	5:09:01 AM	131700	9.7
1/25/2018	5:14:01 AM	132000	9.7
1/25/2018	5:19:01 AM	132300	9.7
1/25/2018	5:24:01 AM	132600	9.71
1/25/2018	5:29:01 AM	132900	9.71
1/25/2018	5:34:01 AM	133200	9.71
1/25/2018	5:39:01 AM	133500	9.71
1/25/2018	5:44:01 AM	133800	9.71
1/25/2018	5:49:01 AM	134100	9.71
1/25/2018	5:54:01 AM	134400	9.71
1/25/2018	5:59:01 AM	134700	9.71

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/25/2018	6:04:01 AM	135000	9.71
1/25/2018	6:09:01 AM	135300	9.71
1/25/2018	6:14:01 AM	135600	9.72
1/25/2018	6:19:01 AM	135900	9.72
1/25/2018	6:24:01 AM	136200	9.72
1/25/2018	6:29:01 AM	136500	9.72
1/25/2018	6:34:01 AM	136800	9.72
1/25/2018	6:39:01 AM	137100	9.72
1/25/2018	6:44:01 AM	137400	9.71
1/25/2018	6:49:01 AM	137700	9.71
1/25/2018	6:54:01 AM	138000	9.72
1/25/2018	6:59:01 AM	138300	9.71
1/25/2018	7:04:01 AM	138600	9.72
1/25/2018	7:09:01 AM	138900	9.71
1/25/2018	7:14:01 AM	139200	9.72
1/25/2018	7:19:01 AM	139500	9.72
1/25/2018	7:24:01 AM	139800	9.72
1/25/2018	7:29:01 AM	140100	9.71
1/25/2018	7:34:01 AM	140400	9.71
1/25/2018	7:39:01 AM	140700	9.71
1/25/2018	7:44:01 AM	141000	9.71
1/25/2018	7:49:01 AM	141300	9.71
1/25/2018	7:54:01 AM	141600	9.71
1/25/2018	7:59:01 AM	141900	9.72
1/25/2018	8:04:01 AM	142200	9.71
1/25/2018	8:09:01 AM	142500	9.72
1/25/2018	8:14:01 AM	142800	9.72
1/25/2018	8:19:01 AM	143100	9.72
1/25/2018	8:24:01 AM	143400	9.72
1/25/2018	8:29:01 AM	143700	9.72
1/25/2018	8:34:01 AM	144000	9.73
1/25/2018	8:39:01 AM	144300	9.72
1/25/2018	8:44:01 AM	144600	9.72
1/25/2018	8:49:01 AM	144900	9.73
1/25/2018	8:54:01 AM	145200	9.72
1/25/2018	8:59:01 AM	145500	9.73
1/25/2018	9:04:01 AM	145800	9.73
1/25/2018	9:09:01 AM	146100	9.72
1/25/2018	9:14:01 AM	146400	9.72
1/25/2018	9:19:01 AM	146700	9.73
1/25/2018	9:24:01 AM	147000	9.72
1/25/2018	9:29:01 AM	147300	9.73
1/25/2018	9:34:01 AM	147600	9.73
1/25/2018	9:39:01 AM	147900	9.73
1/25/2018	9:44:01 AM	148200	9.73

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/25/2018	9:49:01 AM	148500	9.73
1/25/2018	9:54:01 AM	148800	9.72
1/25/2018	9:59:01 AM	149100	9.73
1/25/2018	10:04:01 AM	149400	9.73
1/25/2018	10:09:01 AM	149700	9.73
1/25/2018	10:14:01 AM	150000	9.73
1/25/2018	10:19:01 AM	150300	9.73
1/25/2018	10:24:01 AM	150600	9.73
1/25/2018	10:29:01 AM	150900	9.73
1/25/2018	10:34:01 AM	151200	9.72
1/25/2018	10:39:01 AM	151500	9.73
1/25/2018	10:44:01 AM	151800	9.72
1/25/2018	10:49:01 AM	152100	9.72
1/25/2018	10:54:01 AM	152400	9.73
1/25/2018	10:59:01 AM	152700	9.73
1/25/2018	11:04:01 AM	153000	9.72
1/25/2018	11:09:01 AM	153300	9.72
1/25/2018	11:14:01 AM	153600	9.72
1/25/2018	11:19:01 AM	153900	9.72
1/25/2018	11:24:01 AM	154200	9.72
1/25/2018	11:29:01 AM	154500	9.72
1/25/2018	11:34:01 AM	154800	9.72
1/25/2018	11:39:01 AM	155100	9.72
1/25/2018	11:44:01 AM	155400	9.71
1/25/2018	11:49:01 AM	155700	9.71
1/25/2018	11:54:01 AM	156000	9.71
1/25/2018	11:59:01 AM	156300	9.71
1/25/2018	12:04:01 PM	156600	9.71
1/25/2018	12:09:01 PM	156900	9.7
1/25/2018	12:14:01 PM	157200	9.7
1/25/2018	12:19:01 PM	157500	9.71
1/25/2018	12:24:01 PM	157800	9.71
1/25/2018	12:29:01 PM	158100	9.7
1/25/2018	12:34:01 PM	158400	9.71
1/25/2018	12:39:01 PM	158700	9.71
1/25/2018	12:44:01 PM	159000	9.7
1/25/2018	12:49:01 PM	159300	9.7
1/25/2018	12:54:01 PM	159600	9.7
1/25/2018	12:59:01 PM	159900	9.7
1/25/2018	1:04:01 PM	160200	9.7
1/25/2018	1:09:01 PM	160500	9.69
1/25/2018	1:14:01 PM	160800	9.7
1/25/2018	1:19:01 PM	161100	9.69
1/25/2018	1:24:01 PM	161400	9.69
1/25/2018	1:29:01 PM	161700	9.69

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/25/2018	1:34:01 PM	162000	9.69
1/25/2018	1:39:01 PM	162300	9.69
1/25/2018	1:44:01 PM	162600	9.69
1/25/2018	1:49:01 PM	162900	9.69
1/25/2018	1:54:01 PM	163200	9.69
1/25/2018	1:59:01 PM	163500	9.69
1/25/2018	2:04:01 PM	163800	9.68
1/25/2018	2:09:01 PM	164100	9.69
1/25/2018	2:14:01 PM	164400	9.69
1/25/2018	2:19:01 PM	164700	9.68
1/25/2018	2:24:01 PM	165000	9.68
1/25/2018	2:29:01 PM	165300	9.68
1/25/2018	2:34:01 PM	165600	9.69
1/25/2018	2:39:01 PM	165900	9.68
1/25/2018	2:44:01 PM	166200	9.69
1/25/2018	2:49:01 PM	166500	9.69
1/25/2018	2:54:01 PM	166800	9.69
1/25/2018	2:59:01 PM	167100	9.68
1/25/2018	3:04:01 PM	167400	9.69
1/25/2018	3:09:01 PM	167700	9.69
1/25/2018	3:14:01 PM	168000	9.68
1/25/2018	3:19:01 PM	168300	9.68
1/25/2018	3:24:01 PM	168600	9.68
1/25/2018	3:29:01 PM	168900	9.68
1/25/2018	3:34:01 PM	169200	9.68
1/25/2018	3:39:01 PM	169500	9.68
1/25/2018	3:44:01 PM	169800	9.68
1/25/2018	3:49:01 PM	170100	9.68
1/25/2018	3:54:01 PM	170400	9.67
1/25/2018	3:59:01 PM	170700	9.67
1/25/2018	4:04:01 PM	171000	9.67
1/25/2018	4:09:01 PM	171300	9.67
1/25/2018	4:14:01 PM	171600	9.68
1/25/2018	4:19:01 PM	171900	9.68
1/25/2018	4:24:01 PM	172200	9.67
1/25/2018	4:29:01 PM	172500	9.67
1/25/2018	4:34:01 PM	172800	9.67
1/25/2018	4:39:01 PM	173100	9.67
1/25/2018	4:44:01 PM	173400	9.67
1/25/2018	4:49:01 PM	173700	9.67
1/25/2018	4:54:01 PM	174000	9.67
1/25/2018	4:59:01 PM	174300	9.67
1/25/2018	5:04:01 PM	174600	9.67
1/25/2018	5:09:01 PM	174900	9.68
1/25/2018	5:14:01 PM	175200	9.67

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/25/2018	5:19:01 PM	175500	9.68
1/25/2018	5:24:01 PM	175800	9.68
1/25/2018	5:29:01 PM	176100	9.68
1/25/2018	5:34:01 PM	176400	9.68
1/25/2018	5:39:01 PM	176700	9.68
1/25/2018	5:44:01 PM	177000	9.68
1/25/2018	5:49:01 PM	177300	9.68
1/25/2018	5:54:01 PM	177600	9.68
1/25/2018	5:59:01 PM	177900	9.68
1/25/2018	6:04:01 PM	178200	9.69
1/25/2018	6:09:01 PM	178500	9.68
1/25/2018	6:14:01 PM	178800	9.68
1/25/2018	6:19:01 PM	179100	9.69
1/25/2018	6:24:01 PM	179400	9.68
1/25/2018	6:29:01 PM	179700	9.68
1/25/2018	6:34:01 PM	180000	9.69
1/25/2018	6:39:01 PM	180300	9.69
1/25/2018	6:44:01 PM	180600	9.69
1/25/2018	6:49:01 PM	180900	9.69
1/25/2018	6:54:01 PM	181200	9.69
1/25/2018	6:59:01 PM	181500	9.69
1/25/2018	7:04:01 PM	181800	9.69
1/25/2018	7:09:01 PM	182100	9.69
1/25/2018	7:14:01 PM	182400	9.69
1/25/2018	7:19:01 PM	182700	9.7
1/25/2018	7:24:01 PM	183000	9.7
1/25/2018	7:29:01 PM	183300	9.7
1/25/2018	7:34:01 PM	183600	9.7
1/25/2018	7:39:01 PM	183900	9.7
1/25/2018	7:44:01 PM	184200	9.7
1/25/2018	7:49:01 PM	184500	9.7
1/25/2018	7:54:01 PM	184800	9.7
1/25/2018	7:59:01 PM	185100	9.7
1/25/2018	8:04:01 PM	185400	9.7
1/25/2018	8:09:01 PM	185700	9.7
1/25/2018	8:14:01 PM	186000	9.7
1/25/2018	8:19:01 PM	186300	9.71
1/25/2018	8:24:01 PM	186600	9.71
1/25/2018	8:29:01 PM	186900	9.71
1/25/2018	8:34:01 PM	187200	9.7
1/25/2018	8:39:01 PM	187500	9.71
1/25/2018	8:44:01 PM	187800	9.71
1/25/2018	8:49:01 PM	188100	9.71
1/25/2018	8:54:01 PM	188400	9.71
1/25/2018	8:59:01 PM	188700	9.71

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/25/2018	9:04:01 PM	189000	9.71
1/25/2018	9:09:01 PM	189300	9.71
1/25/2018	9:14:01 PM	189600	9.71
1/25/2018	9:19:01 PM	189900	9.71
1/25/2018	9:24:01 PM	190200	9.71
1/25/2018	9:29:01 PM	190500	9.71
1/25/2018	9:34:01 PM	190800	9.71
1/25/2018	9:39:01 PM	191100	9.71
1/25/2018	9:44:01 PM	191400	9.71
1/25/2018	9:49:01 PM	191700	9.71
1/25/2018	9:54:01 PM	192000	9.71
1/25/2018	9:59:01 PM	192300	9.71
1/25/2018	10:04:01 PM	192600	9.71
1/25/2018	10:09:01 PM	192900	9.71
1/25/2018	10:14:01 PM	193200	9.71
1/25/2018	10:19:01 PM	193500	9.72
1/25/2018	10:24:01 PM	193800	9.72
1/25/2018	10:29:01 PM	194100	9.72
1/25/2018	10:34:01 PM	194400	9.72
1/25/2018	10:39:01 PM	194700	9.71
1/25/2018	10:44:01 PM	195000	9.72
1/25/2018	10:49:01 PM	195300	9.71
1/25/2018	10:54:01 PM	195600	9.71
1/25/2018	10:59:01 PM	195900	9.71
1/25/2018	11:04:01 PM	196200	9.72
1/25/2018	11:09:01 PM	196500	9.72
1/25/2018	11:14:01 PM	196800	9.72
1/25/2018	11:19:01 PM	197100	9.72
1/25/2018	11:24:01 PM	197400	9.72
1/25/2018	11:29:01 PM	197700	9.72
1/25/2018	11:34:01 PM	198000	9.72
1/25/2018	11:39:01 PM	198300	9.72
1/25/2018	11:44:01 PM	198600	9.72
1/25/2018	11:49:01 PM	198900	9.72
1/25/2018	11:54:01 PM	199200	9.72
1/25/2018	11:59:01 PM	199500	9.72
1/26/2018	12:04:01 AM	199800	9.73
1/26/2018	12:09:01 AM	200100	9.73
1/26/2018	12:14:01 AM	200400	9.72
1/26/2018	12:19:01 AM	200700	9.72
1/26/2018	12:24:01 AM	201000	9.73
1/26/2018	12:29:01 AM	201300	9.73
1/26/2018	12:34:01 AM	201600	9.72
1/26/2018	12:39:01 AM	201900	9.73
1/26/2018	12:44:01 AM	202200	9.72

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/26/2018	12:49:01 AM	202500	9.73
1/26/2018	12:54:01 AM	202800	9.72
1/26/2018	12:59:01 AM	203100	9.72
1/26/2018	1:04:01 AM	203400	9.72
1/26/2018	1:09:01 AM	203700	9.72
1/26/2018	1:14:01 AM	204000	9.72
1/26/2018	1:19:01 AM	204300	9.73
1/26/2018	1:24:01 AM	204600	9.72
1/26/2018	1:29:01 AM	204900	9.72
1/26/2018	1:34:01 AM	205200	9.72
1/26/2018	1:39:01 AM	205500	9.73
1/26/2018	1:44:01 AM	205800	9.73
1/26/2018	1:49:01 AM	206100	9.72
1/26/2018	1:54:01 AM	206400	9.72
1/26/2018	1:59:01 AM	206700	9.72
1/26/2018	2:04:01 AM	207000	9.72
1/26/2018	2:09:01 AM	207300	9.72
1/26/2018	2:14:01 AM	207600	9.71
1/26/2018	2:19:01 AM	207900	9.7
1/26/2018	2:24:01 AM	208200	9.69
1/26/2018	2:29:01 AM	208500	9.68
1/26/2018	2:34:01 AM	208800	9.66
1/26/2018	2:39:01 AM	209100	9.67
1/26/2018	2:44:01 AM	209400	9.69
1/26/2018	2:49:01 AM	209700	9.7
1/26/2018	2:54:01 AM	210000	9.7
1/26/2018	2:59:01 AM	210300	9.71
1/26/2018	3:04:01 AM	210600	9.7
1/26/2018	3:09:01 AM	210900	9.71
1/26/2018	3:14:01 AM	211200	9.71
1/26/2018	3:19:01 AM	211500	9.71
1/26/2018	3:24:01 AM	211800	9.72
1/26/2018	3:29:01 AM	212100	9.72
1/26/2018	3:34:01 AM	212400	9.72
1/26/2018	3:39:01 AM	212700	9.72
1/26/2018	3:44:01 AM	213000	9.72
1/26/2018	3:49:01 AM	213300	9.72
1/26/2018	3:54:01 AM	213600	9.72
1/26/2018	3:59:01 AM	213900	9.72
1/26/2018	4:04:01 AM	214200	9.72
1/26/2018	4:09:01 AM	214500	9.72
1/26/2018	4:14:01 AM	214800	9.72
1/26/2018	4:19:01 AM	215100	9.72
1/26/2018	4:24:01 AM	215400	9.73
1/26/2018	4:29:01 AM	215700	9.72

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time	17PZ01
		(seconds)	
1/26/2018	4:34:01 AM	216000	9.72
1/26/2018	4:39:01 AM	216300	9.73
1/26/2018	4:44:01 AM	216600	9.73
1/26/2018	4:49:01 AM	216900	9.73
1/26/2018	4:54:01 AM	217200	9.73
1/26/2018	4:59:01 AM	217500	9.73
1/26/2018	5:04:01 AM	217800	9.73
1/26/2018	5:09:01 AM	218100	9.73
1/26/2018	5:14:01 AM	218400	9.73
1/26/2018	5:19:01 AM	218700	9.73
1/26/2018	5:24:01 AM	219000	9.73
1/26/2018	5:29:01 AM	219300	9.73
1/26/2018	5:34:01 AM	219600	9.73
1/26/2018	5:39:01 AM	219900	9.73
1/26/2018	5:44:01 AM	220200	9.73
1/26/2018	5:49:01 AM	220500	9.73
1/26/2018	5:54:01 AM	220800	9.73
1/26/2018	5:59:01 AM	221100	9.73
1/26/2018	6:04:01 AM	221400	9.73
1/26/2018	6:09:01 AM	221700	9.73
1/26/2018	6:14:01 AM	222000	9.73
1/26/2018	6:19:01 AM	222300	9.73
1/26/2018	6:24:01 AM	222600	9.73
1/26/2018	6:29:01 AM	222900	9.73
1/26/2018	6:34:01 AM	223200	9.74
1/26/2018	6:39:01 AM	223500	9.73
1/26/2018	6:44:01 AM	223800	9.74
1/26/2018	6:49:01 AM	224100	9.74
1/26/2018	6:54:01 AM	224400	9.74
1/26/2018	6:59:01 AM	224700	9.74
1/26/2018	7:04:01 AM	225000	9.74
1/26/2018	7:09:01 AM	225300	9.74
1/26/2018	7:14:01 AM	225600	9.74
1/26/2018	7:19:01 AM	225900	9.75
1/26/2018	7:24:01 AM	226200	9.75
1/26/2018	7:29:01 AM	226500	9.75
1/26/2018	7:34:01 AM	226800	9.75
1/26/2018	7:39:01 AM	227100	9.74
1/26/2018	7:44:01 AM	227400	9.75
1/26/2018	7:49:01 AM	227700	9.75
1/26/2018	7:54:01 AM	228000	9.74
1/26/2018	7:59:01 AM	228300	9.75
1/26/2018	8:04:01 AM	228600	9.74
1/26/2018	8:09:01 AM	228900	9.75
1/26/2018	8:14:01 AM	229200	9.75

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/26/2018	8:19:01 AM	229500	9.75
1/26/2018	8:24:01 AM	229800	9.76
1/26/2018	8:29:01 AM	230100	9.75
1/26/2018	8:34:01 AM	230400	9.75
1/26/2018	8:39:01 AM	230700	9.75
1/26/2018	8:44:01 AM	231000	9.74
1/26/2018	8:49:01 AM	231300	9.75
1/26/2018	8:54:01 AM	231600	9.75
1/26/2018	8:59:01 AM	231900	9.75
1/26/2018	9:04:01 AM	232200	9.75
1/26/2018	9:09:01 AM	232500	9.75
1/26/2018	9:14:01 AM	232800	9.74
1/26/2018	9:19:01 AM	233100	9.74
1/26/2018	9:24:01 AM	233400	9.75
1/26/2018	9:29:01 AM	233700	9.75
1/26/2018	9:34:01 AM	234000	9.75
1/26/2018	9:39:01 AM	234300	9.75
1/26/2018	9:44:01 AM	234600	9.75
1/26/2018	9:49:01 AM	234900	9.75
1/26/2018	9:54:01 AM	235200	9.75
1/26/2018	9:59:01 AM	235500	9.75
1/26/2018	10:04:01 AM	235800	9.75
1/26/2018	10:09:01 AM	236100	9.75
1/26/2018	10:14:01 AM	236400	9.75
1/26/2018	10:19:01 AM	236700	9.75
1/26/2018	10:24:01 AM	237000	9.76
1/26/2018	10:29:01 AM	237300	9.76
1/26/2018	10:34:01 AM	237600	9.76
1/26/2018	10:39:01 AM	237900	9.76
1/26/2018	10:44:01 AM	238200	9.76
1/26/2018	10:49:01 AM	238500	9.76
1/26/2018	10:54:01 AM	238800	9.76
1/26/2018	10:59:01 AM	239100	9.76
1/26/2018	11:04:01 AM	239400	9.76
1/26/2018	11:09:01 AM	239700	9.76
1/26/2018	11:14:01 AM	240000	9.76
1/26/2018	11:19:01 AM	240300	9.76
1/26/2018	11:24:01 AM	240600	9.76
1/26/2018	11:29:01 AM	240900	9.76
1/26/2018	11:34:01 AM	241200	9.76
1/26/2018	11:39:01 AM	241500	9.76
1/26/2018	11:44:01 AM	241800	9.77
1/26/2018	11:49:01 AM	242100	9.78
1/26/2018	11:54:01 AM	242400	9.77
1/26/2018	11:59:01 AM	242700	9.77

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/26/2018	12:04:01 PM	243000	9.76
1/26/2018	12:09:01 PM	243300	9.75
1/26/2018	12:14:01 PM	243600	9.76
1/26/2018	12:19:01 PM	243900	9.76
1/26/2018	12:24:01 PM	244200	9.77
1/26/2018	12:29:01 PM	244500	9.77
1/26/2018	12:34:01 PM	244800	9.76
1/26/2018	12:39:01 PM	245100	9.77
1/26/2018	12:44:01 PM	245400	9.76
1/26/2018	12:49:01 PM	245700	9.76
1/26/2018	12:54:01 PM	246000	9.76
1/26/2018	12:59:01 PM	246300	9.77
1/26/2018	1:04:01 PM	246600	9.76
1/26/2018	1:09:01 PM	246900	9.77
1/26/2018	1:14:01 PM	247200	9.77
1/26/2018	1:19:01 PM	247500	9.77
1/26/2018	1:24:01 PM	247800	9.76
1/26/2018	1:29:01 PM	248100	9.77
1/26/2018	1:34:01 PM	248400	9.77
1/26/2018	1:39:01 PM	248700	9.77
1/26/2018	1:44:01 PM	249000	9.77
1/26/2018	1:49:01 PM	249300	9.77
1/26/2018	1:54:01 PM	249600	9.77
1/26/2018	1:59:01 PM	249900	9.77
1/26/2018	2:04:01 PM	250200	9.77
1/26/2018	2:09:01 PM	250500	9.78
1/26/2018	2:14:01 PM	250800	9.77
1/26/2018	2:19:01 PM	251100	9.77
1/26/2018	2:24:01 PM	251400	9.77
1/26/2018	2:29:01 PM	251700	9.78
1/26/2018	2:34:01 PM	252000	9.78
1/26/2018	2:39:01 PM	252300	9.78
1/26/2018	2:44:01 PM	252600	9.78
1/26/2018	2:49:01 PM	252900	9.78
1/26/2018	2:54:01 PM	253200	9.78
1/26/2018	2:59:01 PM	253500	9.79
1/26/2018	3:04:01 PM	253800	9.78
1/26/2018	3:09:01 PM	254100	9.79
1/26/2018	3:14:01 PM	254400	9.79
1/26/2018	3:19:01 PM	254700	9.79
1/26/2018	3:24:01 PM	255000	9.79
1/26/2018	3:29:01 PM	255300	9.79
1/26/2018	3:34:01 PM	255600	9.8
1/26/2018	3:39:01 PM	255900	9.79
1/26/2018	3:44:01 PM	256200	9.8

17PZ01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/26/2018	3:49:01 PM	256500	9.8
1/26/2018	3:54:01 PM	256800	9.79
1/26/2018	3:59:01 PM	257100	9.8
1/26/2018	4:04:01 PM	257400	9.8
1/26/2018	4:09:01 PM	257700	9.8
1/26/2018	4:14:01 PM	258000	9.8
1/26/2018	4:19:01 PM	258300	9.81
1/26/2018	4:24:01 PM	258600	9.8
1/26/2018	4:29:01 PM	258900	9.81
1/26/2018	4:34:01 PM	259200	9.81
1/26/2018	4:39:01 PM	259500	9.81
1/26/2018	4:44:01 PM	259800	9.81
1/26/2018	4:49:01 PM	260100	9.81
1/26/2018	4:54:01 PM	260400	9.82
1/26/2018	4:59:01 PM	260700	9.82
1/26/2018	5:03:04 PM	260943	9.81

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/23/2018	4:34:01 PM	0	9.93
1/23/2018	4:39:01 PM	300	9.93
1/23/2018	4:44:01 PM	600	9.94
1/23/2018	4:49:01 PM	900	9.95
1/23/2018	4:54:01 PM	1200	9.96
1/23/2018	4:59:01 PM	1500	9.97
1/23/2018	5:04:01 PM	1800	9.99
1/23/2018	5:09:01 PM	2100	9.99
1/23/2018	5:14:01 PM	2400	10
1/23/2018	5:19:01 PM	2700	10
1/23/2018	5:24:01 PM	3000	10.01
1/23/2018	5:29:01 PM	3300	10.01
1/23/2018	5:34:01 PM	3600	10.02
1/23/2018	5:39:01 PM	3900	10.03
1/23/2018	5:44:01 PM	4200	10.03
1/23/2018	5:49:01 PM	4500	10.04
1/23/2018	5:54:01 PM	4800	10.04
1/23/2018	5:59:01 PM	5100	10.05
1/23/2018	6:04:01 PM	5400	10.05
1/23/2018	6:09:01 PM	5700	10.04
1/23/2018	6:14:01 PM	6000	10.05
1/23/2018	6:19:01 PM	6300	10.05
1/23/2018	6:24:01 PM	6600	10.06
1/23/2018	6:29:01 PM	6900	10.07
1/23/2018	6:34:01 PM	7200	10.05
1/23/2018	6:39:01 PM	7500	10.06
1/23/2018	6:44:01 PM	7800	10.07
1/23/2018	6:49:01 PM	8100	10.07
1/23/2018	6:54:01 PM	8400	10.07
1/23/2018	6:59:01 PM	8700	10.07
1/23/2018	7:04:01 PM	9000	10.07
1/23/2018	7:09:01 PM	9300	10.08
1/23/2018	7:14:01 PM	9600	10.08
1/23/2018	7:19:01 PM	9900	10.08
1/23/2018	7:24:01 PM	10200	10.08
1/23/2018	7:29:01 PM	10500	10.08
1/23/2018	7:34:01 PM	10800	10.08
1/23/2018	7:39:01 PM	11100	10.08
1/23/2018	7:44:01 PM	11400	10.08
1/23/2018	7:49:01 PM	11700	10.09
1/23/2018	7:54:01 PM	12000	10.09
1/23/2018	7:59:01 PM	12300	10.09
1/23/2018	8:04:01 PM	12600	10.09
1/23/2018	8:09:01 PM	12900	10.09

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/23/2018	8:14:01 PM	13200	10.09
1/23/2018	8:19:01 PM	13500	10.1
1/23/2018	8:24:01 PM	13800	10.1
1/23/2018	8:29:01 PM	14100	10.1
1/23/2018	8:34:01 PM	14400	10.1
1/23/2018	8:39:01 PM	14700	10.1
1/23/2018	8:44:01 PM	15000	10.1
1/23/2018	8:49:01 PM	15300	10.11
1/23/2018	8:54:01 PM	15600	10.1
1/23/2018	8:59:01 PM	15900	10.11
1/23/2018	9:04:01 PM	16200	10.1
1/23/2018	9:09:01 PM	16500	10.11
1/23/2018	9:14:01 PM	16800	10.11
1/23/2018	9:19:01 PM	17100	10.11
1/23/2018	9:24:01 PM	17400	10.11
1/23/2018	9:29:01 PM	17700	10.11
1/23/2018	9:34:01 PM	18000	10.11
1/23/2018	9:39:01 PM	18300	10.11
1/23/2018	9:44:01 PM	18600	10.11
1/23/2018	9:49:01 PM	18900	10.11
1/23/2018	9:54:01 PM	19200	10.11
1/23/2018	9:59:01 PM	19500	10.11
1/23/2018	10:04:01 PM	19800	10.1
1/23/2018	10:09:01 PM	20100	10.11
1/23/2018	10:14:01 PM	20400	10.12
1/23/2018	10:19:01 PM	20700	10.11
1/23/2018	10:24:01 PM	21000	10.11
1/23/2018	10:29:01 PM	21300	10.12
1/23/2018	10:34:01 PM	21600	10.11
1/23/2018	10:39:01 PM	21900	10.11
1/23/2018	10:44:01 PM	22200	10.12
1/23/2018	10:49:01 PM	22500	10.12
1/23/2018	10:54:01 PM	22800	10.12
1/23/2018	10:59:01 PM	23100	10.12
1/23/2018	11:04:01 PM	23400	10.12
1/23/2018	11:09:01 PM	23700	10.12
1/23/2018	11:14:01 PM	24000	10.12
1/23/2018	11:19:01 PM	24300	10.12
1/23/2018	11:24:01 PM	24600	10.12
1/23/2018	11:29:01 PM	24900	10.12
1/23/2018	11:34:01 PM	25200	10.13
1/23/2018	11:39:01 PM	25500	10.12
1/23/2018	11:44:01 PM	25800	10.13
1/23/2018	11:49:01 PM	26100	10.13

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/23/2018	11:54:01 PM	26400	10.13
1/23/2018	11:59:01 PM	26700	10.13
1/24/2018	12:04:01 AM	27000	10.13
1/24/2018	12:09:01 AM	27300	10.13
1/24/2018	12:14:01 AM	27600	10.13
1/24/2018	12:19:01 AM	27900	10.13
1/24/2018	12:24:01 AM	28200	10.13
1/24/2018	12:29:01 AM	28500	10.13
1/24/2018	12:34:01 AM	28800	10.13
1/24/2018	12:39:01 AM	29100	10.12
1/24/2018	12:44:01 AM	29400	10.13
1/24/2018	12:49:01 AM	29700	10.13
1/24/2018	12:54:01 AM	30000	10.13
1/24/2018	12:59:01 AM	30300	10.13
1/24/2018	1:04:01 AM	30600	10.14
1/24/2018	1:09:01 AM	30900	10.13
1/24/2018	1:14:01 AM	31200	10.14
1/24/2018	1:19:01 AM	31500	10.13
1/24/2018	1:24:01 AM	31800	10.14
1/24/2018	1:29:01 AM	32100	10.14
1/24/2018	1:34:01 AM	32400	10.13
1/24/2018	1:39:01 AM	32700	10.14
1/24/2018	1:44:01 AM	33000	10.13
1/24/2018	1:49:01 AM	33300	10.14
1/24/2018	1:54:01 AM	33600	10.14
1/24/2018	1:59:01 AM	33900	10.15
1/24/2018	2:04:01 AM	34200	10.14
1/24/2018	2:09:01 AM	34500	10.14
1/24/2018	2:14:01 AM	34800	10.15
1/24/2018	2:19:01 AM	35100	10.15
1/24/2018	2:24:01 AM	35400	10.15
1/24/2018	2:29:01 AM	35700	10.15
1/24/2018	2:34:01 AM	36000	10.15
1/24/2018	2:39:01 AM	36300	10.15
1/24/2018	2:44:01 AM	36600	10.15
1/24/2018	2:49:01 AM	36900	10.15
1/24/2018	2:54:01 AM	37200	10.15
1/24/2018	2:59:01 AM	37500	10.16
1/24/2018	3:04:01 AM	37800	10.16
1/24/2018	3:09:01 AM	38100	10.16
1/24/2018	3:14:01 AM	38400	10.16
1/24/2018	3:19:01 AM	38700	10.16
1/24/2018	3:24:01 AM	39000	10.16
1/24/2018	3:29:01 AM	39300	10.16

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/24/2018	3:34:01 AM	39600	10.16
1/24/2018	3:39:01 AM	39900	10.16
1/24/2018	3:44:01 AM	40200	10.16
1/24/2018	3:49:01 AM	40500	10.16
1/24/2018	3:54:01 AM	40800	10.16
1/24/2018	3:59:01 AM	41100	10.16
1/24/2018	4:04:01 AM	41400	10.16
1/24/2018	4:09:01 AM	41700	10.17
1/24/2018	4:14:01 AM	42000	10.17
1/24/2018	4:19:01 AM	42300	10.17
1/24/2018	4:24:01 AM	42600	10.17
1/24/2018	4:29:01 AM	42900	10.16
1/24/2018	4:34:01 AM	43200	10.17
1/24/2018	4:39:01 AM	43500	10.16
1/24/2018	4:44:01 AM	43800	10.16
1/24/2018	4:49:01 AM	44100	10.17
1/24/2018	4:54:01 AM	44400	10.16
1/24/2018	4:59:01 AM	44700	10.17
1/24/2018	5:04:01 AM	45000	10.17
1/24/2018	5:09:01 AM	45300	10.17
1/24/2018	5:14:01 AM	45600	10.17
1/24/2018	5:19:01 AM	45900	10.17
1/24/2018	5:24:01 AM	46200	10.17
1/24/2018	5:29:01 AM	46500	10.17
1/24/2018	5:34:01 AM	46800	10.17
1/24/2018	5:39:01 AM	47100	10.17
1/24/2018	5:44:01 AM	47400	10.17
1/24/2018	5:49:01 AM	47700	10.17
1/24/2018	5:54:01 AM	48000	10.17
1/24/2018	5:59:01 AM	48300	10.17
1/24/2018	6:04:01 AM	48600	10.18
1/24/2018	6:09:01 AM	48900	10.18
1/24/2018	6:14:01 AM	49200	10.17
1/24/2018	6:19:01 AM	49500	10.18
1/24/2018	6:24:01 AM	49800	10.17
1/24/2018	6:29:01 AM	50100	10.18
1/24/2018	6:34:01 AM	50400	10.18
1/24/2018	6:39:01 AM	50700	10.18
1/24/2018	6:44:01 AM	51000	10.18
1/24/2018	6:49:01 AM	51300	10.17
1/24/2018	6:54:01 AM	51600	10.18
1/24/2018	6:59:01 AM	51900	10.19
1/24/2018	7:04:01 AM	52200	10.18
1/24/2018	7:09:01 AM	52500	10.18

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/24/2018	7:14:01 AM	52800	10.18
1/24/2018	7:19:01 AM	53100	10.18
1/24/2018	7:24:01 AM	53400	10.18
1/24/2018	7:29:01 AM	53700	10.18
1/24/2018	7:34:01 AM	54000	10.18
1/24/2018	7:39:01 AM	54300	10.18
1/24/2018	7:44:01 AM	54600	10.19
1/24/2018	7:49:01 AM	54900	10.19
1/24/2018	7:54:01 AM	55200	10.19
1/24/2018	7:59:01 AM	55500	10.19
1/24/2018	8:04:01 AM	55800	10.19
1/24/2018	8:09:01 AM	56100	10.19
1/24/2018	8:14:01 AM	56400	10.19
1/24/2018	8:19:01 AM	56700	10.2
1/24/2018	8:24:01 AM	57000	10.18
1/24/2018	8:29:01 AM	57300	10.19
1/24/2018	8:34:01 AM	57600	10.19
1/24/2018	8:39:01 AM	57900	10.2
1/24/2018	8:44:01 AM	58200	10.19
1/24/2018	8:49:01 AM	58500	10.2
1/24/2018	8:54:01 AM	58800	10.2
1/24/2018	8:59:01 AM	59100	10.2
1/24/2018	9:04:01 AM	59400	10.2
1/24/2018	9:09:01 AM	59700	10.2
1/24/2018	9:14:01 AM	60000	10.2
1/24/2018	9:19:01 AM	60300	10.2
1/24/2018	9:24:01 AM	60600	10.2
1/24/2018	9:29:01 AM	60900	10.21
1/24/2018	9:34:01 AM	61200	10.2
1/24/2018	9:39:01 AM	61500	10.2
1/24/2018	9:44:01 AM	61800	10.2
1/24/2018	9:49:01 AM	62100	10.2
1/24/2018	9:54:01 AM	62400	10.2
1/24/2018	9:59:01 AM	62700	10.2
1/24/2018	10:04:01 AM	63000	10.2
1/24/2018	10:09:01 AM	63300	10.21
1/24/2018	10:14:01 AM	63600	10.2
1/24/2018	10:19:01 AM	63900	10.21
1/24/2018	10:24:01 AM	64200	10.21
1/24/2018	10:29:01 AM	64500	10.2
1/24/2018	10:34:01 AM	64800	10.21
1/24/2018	10:39:01 AM	65100	10.21
1/24/2018	10:44:01 AM	65400	10.2
1/24/2018	10:49:01 AM	65700	10.21

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/24/2018	10:54:01 AM	66000	10.2
1/24/2018	10:59:01 AM	66300	10.2
1/24/2018	11:04:01 AM	66600	10.2
1/24/2018	11:09:01 AM	66900	10.2
1/24/2018	11:14:01 AM	67200	10.2
1/24/2018	11:19:01 AM	67500	10.2
1/24/2018	11:24:01 AM	67800	10.2
1/24/2018	11:29:01 AM	68100	10.2
1/24/2018	11:34:01 AM	68400	10.2
1/24/2018	11:39:01 AM	68700	10.2
1/24/2018	11:44:01 AM	69000	10.19
1/24/2018	11:49:01 AM	69300	10.19
1/24/2018	11:54:01 AM	69600	10.19
1/24/2018	11:59:01 AM	69900	10.19
1/24/2018	12:04:01 PM	70200	10.19
1/24/2018	12:09:01 PM	70500	10.19
1/24/2018	12:14:01 PM	70800	10.18
1/24/2018	12:19:01 PM	71100	10.18
1/24/2018	12:24:01 PM	71400	10.18
1/24/2018	12:29:01 PM	71700	10.17
1/24/2018	12:34:01 PM	72000	10.17
1/24/2018	12:39:01 PM	72300	10.17
1/24/2018	12:44:01 PM	72600	10.17
1/24/2018	12:49:01 PM	72900	10.17
1/24/2018	12:54:01 PM	73200	10.18
1/24/2018	12:59:01 PM	73500	10.17
1/24/2018	1:04:01 PM	73800	10.17
1/24/2018	1:09:01 PM	74100	10.17
1/24/2018	1:14:01 PM	74400	10.17
1/24/2018	1:19:01 PM	74700	10.17
1/24/2018	1:24:01 PM	75000	10.17
1/24/2018	1:29:01 PM	75300	10.17
1/24/2018	1:34:01 PM	75600	10.17
1/24/2018	1:39:01 PM	75900	10.18
1/24/2018	1:44:01 PM	76200	10.17
1/24/2018	1:49:01 PM	76500	10.17
1/24/2018	1:54:01 PM	76800	10.17
1/24/2018	1:59:01 PM	77100	10.17
1/24/2018	2:04:01 PM	77400	10.17
1/24/2018	2:09:01 PM	77700	10.17
1/24/2018	2:14:01 PM	78000	10.17
1/24/2018	2:19:01 PM	78300	10.16
1/24/2018	2:24:01 PM	78600	10.17
1/24/2018	2:29:01 PM	78900	10.17

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/24/2018	2:34:01 PM	79200	10.17
1/24/2018	2:39:01 PM	79500	10.17
1/24/2018	2:44:01 PM	79800	10.17
1/24/2018	2:49:01 PM	80100	10.17
1/24/2018	2:54:01 PM	80400	10.17
1/24/2018	2:59:01 PM	80700	10.17
1/24/2018	3:04:01 PM	81000	10.16
1/24/2018	3:09:01 PM	81300	10.16
1/24/2018	3:14:01 PM	81600	10.17
1/24/2018	3:19:01 PM	81900	10.17
1/24/2018	3:24:01 PM	82200	10.17
1/24/2018	3:29:01 PM	82500	10.16
1/24/2018	3:34:01 PM	82800	10.17
1/24/2018	3:39:01 PM	83100	10.17
1/24/2018	3:44:01 PM	83400	10.17
1/24/2018	3:49:01 PM	83700	10.17
1/24/2018	3:54:01 PM	84000	10.17
1/24/2018	3:59:01 PM	84300	10.17
1/24/2018	4:04:01 PM	84600	10.17
1/24/2018	4:09:01 PM	84900	10.17
1/24/2018	4:14:01 PM	85200	10.17
1/24/2018	4:19:01 PM	85500	10.17
1/24/2018	4:24:01 PM	85800	10.17
1/24/2018	4:29:01 PM	86100	10.17
1/24/2018	4:34:01 PM	86400	10.17
1/24/2018	4:39:01 PM	86700	10.17
1/24/2018	4:44:01 PM	87000	10.17
1/24/2018	4:49:01 PM	87300	10.18
1/24/2018	4:54:01 PM	87600	10.17
1/24/2018	4:59:01 PM	87900	10.17
1/24/2018	5:04:01 PM	88200	10.18
1/24/2018	5:09:01 PM	88500	10.17
1/24/2018	5:14:01 PM	88800	10.18
1/24/2018	5:19:01 PM	89100	10.18
1/24/2018	5:24:01 PM	89400	10.18
1/24/2018	5:29:01 PM	89700	10.18
1/24/2018	5:34:01 PM	90000	10.18
1/24/2018	5:39:01 PM	90300	10.18
1/24/2018	5:44:01 PM	90600	10.18
1/24/2018	5:49:01 PM	90900	10.18
1/24/2018	5:54:01 PM	91200	10.18
1/24/2018	5:59:01 PM	91500	10.19
1/24/2018	6:04:01 PM	91800	10.18
1/24/2018	6:09:01 PM	92100	10.18

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/24/2018	6:14:01 PM	92400	10.18
1/24/2018	6:19:01 PM	92700	10.18
1/24/2018	6:24:01 PM	93000	10.19
1/24/2018	6:29:01 PM	93300	10.18
1/24/2018	6:34:01 PM	93600	10.18
1/24/2018	6:39:01 PM	93900	10.19
1/24/2018	6:44:01 PM	94200	10.19
1/24/2018	6:49:01 PM	94500	10.19
1/24/2018	6:54:01 PM	94800	10.19
1/24/2018	6:59:01 PM	95100	10.19
1/24/2018	7:04:01 PM	95400	10.19
1/24/2018	7:09:01 PM	95700	10.19
1/24/2018	7:14:01 PM	96000	10.19
1/24/2018	7:19:01 PM	96300	10.19
1/24/2018	7:24:01 PM	96600	10.19
1/24/2018	7:29:01 PM	96900	10.19
1/24/2018	7:34:01 PM	97200	10.19
1/24/2018	7:39:01 PM	97500	10.19
1/24/2018	7:44:01 PM	97800	10.19
1/24/2018	7:49:01 PM	98100	10.2
1/24/2018	7:54:01 PM	98400	10.19
1/24/2018	7:59:01 PM	98700	10.2
1/24/2018	8:04:01 PM	99000	10.19
1/24/2018	8:09:01 PM	99300	10.19
1/24/2018	8:14:01 PM	99600	10.19
1/24/2018	8:19:01 PM	99900	10.19
1/24/2018	8:24:01 PM	100200	10.19
1/24/2018	8:29:01 PM	100500	10.19
1/24/2018	8:34:01 PM	100800	10.19
1/24/2018	8:39:01 PM	101100	10.19
1/24/2018	8:44:01 PM	101400	10.19
1/24/2018	8:49:01 PM	101700	10.19
1/24/2018	8:54:01 PM	102000	10.19
1/24/2018	8:59:01 PM	102300	10.19
1/24/2018	9:04:01 PM	102600	10.2
1/24/2018	9:09:01 PM	102900	10.19
1/24/2018	9:14:01 PM	103200	10.2
1/24/2018	9:19:01 PM	103500	10.19
1/24/2018	9:24:01 PM	103800	10.2
1/24/2018	9:29:01 PM	104100	10.19
1/24/2018	9:34:01 PM	104400	10.19
1/24/2018	9:39:01 PM	104700	10.2
1/24/2018	9:44:01 PM	105000	10.2
1/24/2018	9:49:01 PM	105300	10.2

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/24/2018	9:54:01 PM	105600	10.2
1/24/2018	9:59:01 PM	105900	10.2
1/24/2018	10:04:01 PM	106200	10.2
1/24/2018	10:09:01 PM	106500	10.2
1/24/2018	10:14:01 PM	106800	10.2
1/24/2018	10:19:01 PM	107100	10.2
1/24/2018	10:24:01 PM	107400	10.2
1/24/2018	10:29:01 PM	107700	10.2
1/24/2018	10:34:01 PM	108000	10.2
1/24/2018	10:39:01 PM	108300	10.21
1/24/2018	10:44:01 PM	108600	10.2
1/24/2018	10:49:01 PM	108900	10.21
1/24/2018	10:54:01 PM	109200	10.2
1/24/2018	10:59:01 PM	109500	10.21
1/24/2018	11:04:01 PM	109800	10.2
1/24/2018	11:09:01 PM	110100	10.2
1/24/2018	11:14:01 PM	110400	10.2
1/24/2018	11:19:01 PM	110700	10.2
1/24/2018	11:24:01 PM	111000	10.2
1/24/2018	11:29:01 PM	111300	10.2
1/24/2018	11:34:01 PM	111600	10.2
1/24/2018	11:39:01 PM	111900	10.21
1/24/2018	11:44:01 PM	112200	10.2
1/24/2018	11:49:01 PM	112500	10.21
1/24/2018	11:54:01 PM	112800	10.2
1/24/2018	11:59:01 PM	113100	10.2
1/25/2018	12:04:01 AM	113400	10.2
1/25/2018	12:09:01 AM	113700	10.2
1/25/2018	12:14:01 AM	114000	10.21
1/25/2018	12:19:01 AM	114300	10.21
1/25/2018	12:24:01 AM	114600	10.21
1/25/2018	12:29:01 AM	114900	10.2
1/25/2018	12:34:01 AM	115200	10.2
1/25/2018	12:39:01 AM	115500	10.2
1/25/2018	12:44:01 AM	115800	10.2
1/25/2018	12:49:01 AM	116100	10.2
1/25/2018	12:54:01 AM	116400	10.2
1/25/2018	12:59:01 AM	116700	10.21
1/25/2018	1:04:01 AM	117000	10.2
1/25/2018	1:09:01 AM	117300	10.2
1/25/2018	1:14:01 AM	117600	10.2
1/25/2018	1:19:01 AM	117900	10.2
1/25/2018	1:24:01 AM	118200	10.2
1/25/2018	1:29:01 AM	118500	10.2

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	1:34:01 AM	118800	10.2
1/25/2018	1:39:01 AM	119100	10.2
1/25/2018	1:44:01 AM	119400	10.2
1/25/2018	1:49:01 AM	119700	10.2
1/25/2018	1:54:01 AM	120000	10.2
1/25/2018	1:59:01 AM	120300	10.2
1/25/2018	2:04:01 AM	120600	10.2
1/25/2018	2:09:01 AM	120900	10.19
1/25/2018	2:14:01 AM	121200	10.2
1/25/2018	2:19:01 AM	121500	10.2
1/25/2018	2:24:01 AM	121800	10.2
1/25/2018	2:29:01 AM	122100	10.2
1/25/2018	2:34:01 AM	122400	10.2
1/25/2018	2:39:01 AM	122700	10.2
1/25/2018	2:44:01 AM	123000	10.2
1/25/2018	2:49:01 AM	123300	10.2
1/25/2018	2:54:01 AM	123600	10.2
1/25/2018	2:59:01 AM	123900	10.2
1/25/2018	3:04:01 AM	124200	10.2
1/25/2018	3:09:01 AM	124500	10.2
1/25/2018	3:14:01 AM	124800	10.2
1/25/2018	3:19:01 AM	125100	10.2
1/25/2018	3:24:01 AM	125400	10.2
1/25/2018	3:29:01 AM	125700	10.2
1/25/2018	3:34:01 AM	126000	10.2
1/25/2018	3:39:01 AM	126300	10.2
1/25/2018	3:44:01 AM	126600	10.2
1/25/2018	3:49:01 AM	126900	10.2
1/25/2018	3:54:01 AM	127200	10.2
1/25/2018	3:59:01 AM	127500	10.2
1/25/2018	4:04:01 AM	127800	10.2
1/25/2018	4:09:01 AM	128100	10.2
1/25/2018	4:14:01 AM	128400	10.2
1/25/2018	4:19:01 AM	128700	10.2
1/25/2018	4:24:01 AM	129000	10.2
1/25/2018	4:29:01 AM	129300	10.2
1/25/2018	4:34:01 AM	129600	10.2
1/25/2018	4:39:01 AM	129900	10.2
1/25/2018	4:44:01 AM	130200	10.2
1/25/2018	4:49:01 AM	130500	10.2
1/25/2018	4:54:01 AM	130800	10.2
1/25/2018	4:59:01 AM	131100	10.2
1/25/2018	5:04:01 AM	131400	10.2
1/25/2018	5:09:01 AM	131700	10.2

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	5:14:01 AM	132000	10.2
1/25/2018	5:19:01 AM	132300	10.21
1/25/2018	5:24:01 AM	132600	10.21
1/25/2018	5:29:01 AM	132900	10.21
1/25/2018	5:34:01 AM	133200	10.21
1/25/2018	5:39:01 AM	133500	10.21
1/25/2018	5:44:01 AM	133800	10.21
1/25/2018	5:49:01 AM	134100	10.22
1/25/2018	5:54:01 AM	134400	10.21
1/25/2018	5:59:01 AM	134700	10.21
1/25/2018	6:04:01 AM	135000	10.21
1/25/2018	6:09:01 AM	135300	10.22
1/25/2018	6:14:01 AM	135600	10.22
1/25/2018	6:19:01 AM	135900	10.22
1/25/2018	6:24:01 AM	136200	10.22
1/25/2018	6:29:01 AM	136500	10.22
1/25/2018	6:34:01 AM	136800	10.22
1/25/2018	6:39:01 AM	137100	10.22
1/25/2018	6:44:01 AM	137400	10.21
1/25/2018	6:49:01 AM	137700	10.22
1/25/2018	6:54:01 AM	138000	10.21
1/25/2018	6:59:01 AM	138300	10.22
1/25/2018	7:04:01 AM	138600	10.22
1/25/2018	7:09:01 AM	138900	10.21
1/25/2018	7:14:01 AM	139200	10.21
1/25/2018	7:19:01 AM	139500	10.22
1/25/2018	7:24:01 AM	139800	10.22
1/25/2018	7:29:01 AM	140100	10.22
1/25/2018	7:34:01 AM	140400	10.22
1/25/2018	7:39:01 AM	140700	10.21
1/25/2018	7:44:01 AM	141000	10.22
1/25/2018	7:49:01 AM	141300	10.22
1/25/2018	7:54:01 AM	141600	10.22
1/25/2018	7:59:01 AM	141900	10.22
1/25/2018	8:04:01 AM	142200	10.22
1/25/2018	8:09:01 AM	142500	10.22
1/25/2018	8:14:01 AM	142800	10.22
1/25/2018	8:19:01 AM	143100	10.22
1/25/2018	8:24:01 AM	143400	10.22
1/25/2018	8:29:01 AM	143700	10.22
1/25/2018	8:34:01 AM	144000	10.23
1/25/2018	8:39:01 AM	144300	10.22
1/25/2018	8:44:01 AM	144600	10.22
1/25/2018	8:49:01 AM	144900	10.22

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	8:54:01 AM	145200	10.22
1/25/2018	8:59:01 AM	145500	10.22
1/25/2018	9:04:01 AM	145800	10.23
1/25/2018	9:09:01 AM	146100	10.23
1/25/2018	9:14:01 AM	146400	10.22
1/25/2018	9:19:01 AM	146700	10.23
1/25/2018	9:24:01 AM	147000	10.23
1/25/2018	9:29:01 AM	147300	10.23
1/25/2018	9:34:01 AM	147600	10.23
1/25/2018	9:39:01 AM	147900	10.23
1/25/2018	9:44:01 AM	148200	10.23
1/25/2018	9:49:01 AM	148500	10.23
1/25/2018	9:54:01 AM	148800	10.23
1/25/2018	9:59:01 AM	149100	10.22
1/25/2018	10:04:01 AM	149400	10.23
1/25/2018	10:09:01 AM	149700	10.23
1/25/2018	10:14:01 AM	150000	10.23
1/25/2018	10:19:01 AM	150300	10.23
1/25/2018	10:24:01 AM	150600	10.22
1/25/2018	10:29:01 AM	150900	10.23
1/25/2018	10:34:01 AM	151200	10.23
1/25/2018	10:39:01 AM	151500	10.22
1/25/2018	10:44:01 AM	151800	10.22
1/25/2018	10:49:01 AM	152100	10.23
1/25/2018	10:54:01 AM	152400	10.22
1/25/2018	10:59:01 AM	152700	10.22
1/25/2018	11:04:01 AM	153000	10.22
1/25/2018	11:09:01 AM	153300	10.22
1/25/2018	11:14:01 AM	153600	10.22
1/25/2018	11:19:01 AM	153900	10.22
1/25/2018	11:24:01 AM	154200	10.22
1/25/2018	11:29:01 AM	154500	10.22
1/25/2018	11:34:01 AM	154800	10.22
1/25/2018	11:39:01 AM	155100	10.21
1/25/2018	11:44:01 AM	155400	10.21
1/25/2018	11:49:01 AM	155700	10.22
1/25/2018	11:54:01 AM	156000	10.21
1/25/2018	11:59:01 AM	156300	10.21
1/25/2018	12:04:01 PM	156600	10.21
1/25/2018	12:09:01 PM	156900	10.2
1/25/2018	12:14:01 PM	157200	10.21
1/25/2018	12:19:01 PM	157500	10.21
1/25/2018	12:24:01 PM	157800	10.2
1/25/2018	12:29:01 PM	158100	10.21

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	12:34:01 PM	158400	10.21
1/25/2018	12:39:01 PM	158700	10.21
1/25/2018	12:44:01 PM	159000	10.2
1/25/2018	12:49:01 PM	159300	10.2
1/25/2018	12:54:01 PM	159600	10.2
1/25/2018	12:59:01 PM	159900	10.2
1/25/2018	1:04:01 PM	160200	10.2
1/25/2018	1:09:01 PM	160500	10.19
1/25/2018	1:14:01 PM	160800	10.19
1/25/2018	1:19:01 PM	161100	10.19
1/25/2018	1:24:01 PM	161400	10.19
1/25/2018	1:29:01 PM	161700	10.19
1/25/2018	1:34:01 PM	162000	10.19
1/25/2018	1:39:01 PM	162300	10.19
1/25/2018	1:44:01 PM	162600	10.19
1/25/2018	1:49:01 PM	162900	10.19
1/25/2018	1:54:01 PM	163200	10.19
1/25/2018	1:59:01 PM	163500	10.19
1/25/2018	2:04:01 PM	163800	10.19
1/25/2018	2:09:01 PM	164100	10.19
1/25/2018	2:14:01 PM	164400	10.19
1/25/2018	2:19:01 PM	164700	10.19
1/25/2018	2:24:01 PM	165000	10.18
1/25/2018	2:29:01 PM	165300	10.19
1/25/2018	2:34:01 PM	165600	10.19
1/25/2018	2:39:01 PM	165900	10.18
1/25/2018	2:44:01 PM	166200	10.19
1/25/2018	2:49:01 PM	166500	10.18
1/25/2018	2:54:01 PM	166800	10.18
1/25/2018	2:59:01 PM	167100	10.18
1/25/2018	3:04:01 PM	167400	10.18
1/25/2018	3:09:01 PM	167700	10.18
1/25/2018	3:14:01 PM	168000	10.19
1/25/2018	3:19:01 PM	168300	10.18
1/25/2018	3:24:01 PM	168600	10.18
1/25/2018	3:29:01 PM	168900	10.18
1/25/2018	3:34:01 PM	169200	10.18
1/25/2018	3:39:01 PM	169500	10.18
1/25/2018	3:44:01 PM	169800	10.18
1/25/2018	3:49:01 PM	170100	10.18
1/25/2018	3:54:01 PM	170400	10.18
1/25/2018	3:59:01 PM	170700	10.18
1/25/2018	4:04:01 PM	171000	10.18
1/25/2018	4:09:01 PM	171300	10.18

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	4:14:01 PM	171600	10.18
1/25/2018	4:19:01 PM	171900	10.18
1/25/2018	4:24:01 PM	172200	10.18
1/25/2018	4:29:01 PM	172500	10.18
1/25/2018	4:34:01 PM	172800	10.18
1/25/2018	4:39:01 PM	173100	10.17
1/25/2018	4:44:01 PM	173400	10.18
1/25/2018	4:49:01 PM	173700	10.17
1/25/2018	4:54:01 PM	174000	10.18
1/25/2018	4:59:01 PM	174300	10.18
1/25/2018	5:04:01 PM	174600	10.18
1/25/2018	5:09:01 PM	174900	10.18
1/25/2018	5:14:01 PM	175200	10.18
1/25/2018	5:19:01 PM	175500	10.18
1/25/2018	5:24:01 PM	175800	10.18
1/25/2018	5:29:01 PM	176100	10.18
1/25/2018	5:34:01 PM	176400	10.18
1/25/2018	5:39:01 PM	176700	10.19
1/25/2018	5:44:01 PM	177000	10.18
1/25/2018	5:49:01 PM	177300	10.19
1/25/2018	5:54:01 PM	177600	10.18
1/25/2018	5:59:01 PM	177900	10.19
1/25/2018	6:04:01 PM	178200	10.19
1/25/2018	6:09:01 PM	178500	10.19
1/25/2018	6:14:01 PM	178800	10.19
1/25/2018	6:19:01 PM	179100	10.19
1/25/2018	6:24:01 PM	179400	10.19
1/25/2018	6:29:01 PM	179700	10.19
1/25/2018	6:34:01 PM	180000	10.2
1/25/2018	6:39:01 PM	180300	10.19
1/25/2018	6:44:01 PM	180600	10.2
1/25/2018	6:49:01 PM	180900	10.2
1/25/2018	6:54:01 PM	181200	10.2
1/25/2018	6:59:01 PM	181500	10.2
1/25/2018	7:04:01 PM	181800	10.2
1/25/2018	7:09:01 PM	182100	10.2
1/25/2018	7:14:01 PM	182400	10.2
1/25/2018	7:19:01 PM	182700	10.2
1/25/2018	7:24:01 PM	183000	10.2
1/25/2018	7:29:01 PM	183300	10.21
1/25/2018	7:34:01 PM	183600	10.2
1/25/2018	7:39:01 PM	183900	10.2
1/25/2018	7:44:01 PM	184200	10.2
1/25/2018	7:49:01 PM	184500	10.21

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	7:54:01 PM	184800	10.21
1/25/2018	7:59:01 PM	185100	10.2
1/25/2018	8:04:01 PM	185400	10.21
1/25/2018	8:09:01 PM	185700	10.21
1/25/2018	8:14:01 PM	186000	10.22
1/25/2018	8:19:01 PM	186300	10.21
1/25/2018	8:24:01 PM	186600	10.21
1/25/2018	8:29:01 PM	186900	10.21
1/25/2018	8:34:01 PM	187200	10.21
1/25/2018	8:39:01 PM	187500	10.22
1/25/2018	8:44:01 PM	187800	10.22
1/25/2018	8:49:01 PM	188100	10.22
1/25/2018	8:54:01 PM	188400	10.22
1/25/2018	8:59:01 PM	188700	10.22
1/25/2018	9:04:01 PM	189000	10.22
1/25/2018	9:09:01 PM	189300	10.22
1/25/2018	9:14:01 PM	189600	10.22
1/25/2018	9:19:01 PM	189900	10.22
1/25/2018	9:24:01 PM	190200	10.22
1/25/2018	9:29:01 PM	190500	10.22
1/25/2018	9:34:01 PM	190800	10.22
1/25/2018	9:39:01 PM	191100	10.22
1/25/2018	9:44:01 PM	191400	10.22
1/25/2018	9:49:01 PM	191700	10.22
1/25/2018	9:54:01 PM	192000	10.22
1/25/2018	9:59:01 PM	192300	10.22
1/25/2018	10:04:01 PM	192600	10.22
1/25/2018	10:09:01 PM	192900	10.22
1/25/2018	10:14:01 PM	193200	10.22
1/25/2018	10:19:01 PM	193500	10.23
1/25/2018	10:24:01 PM	193800	10.23
1/25/2018	10:29:01 PM	194100	10.23
1/25/2018	10:34:01 PM	194400	10.23
1/25/2018	10:39:01 PM	194700	10.22
1/25/2018	10:44:01 PM	195000	10.22
1/25/2018	10:49:01 PM	195300	10.22
1/25/2018	10:54:01 PM	195600	10.22
1/25/2018	10:59:01 PM	195900	10.22
1/25/2018	11:04:01 PM	196200	10.23
1/25/2018	11:09:01 PM	196500	10.23
1/25/2018	11:14:01 PM	196800	10.23
1/25/2018	11:19:01 PM	197100	10.23
1/25/2018	11:24:01 PM	197400	10.23
1/25/2018	11:29:01 PM	197700	10.24

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/25/2018	11:34:01 PM	198000	10.23
1/25/2018	11:39:01 PM	198300	10.23
1/25/2018	11:44:01 PM	198600	10.23
1/25/2018	11:49:01 PM	198900	10.24
1/25/2018	11:54:01 PM	199200	10.23
1/25/2018	11:59:01 PM	199500	10.23
1/26/2018	12:04:01 AM	199800	10.23
1/26/2018	12:09:01 AM	200100	10.24
1/26/2018	12:14:01 AM	200400	10.23
1/26/2018	12:19:01 AM	200700	10.24
1/26/2018	12:24:01 AM	201000	10.24
1/26/2018	12:29:01 AM	201300	10.23
1/26/2018	12:34:01 AM	201600	10.23
1/26/2018	12:39:01 AM	201900	10.24
1/26/2018	12:44:01 AM	202200	10.24
1/26/2018	12:49:01 AM	202500	10.24
1/26/2018	12:54:01 AM	202800	10.23
1/26/2018	12:59:01 AM	203100	10.23
1/26/2018	1:04:01 AM	203400	10.23
1/26/2018	1:09:01 AM	203700	10.23
1/26/2018	1:14:01 AM	204000	10.24
1/26/2018	1:19:01 AM	204300	10.23
1/26/2018	1:24:01 AM	204600	10.23
1/26/2018	1:29:01 AM	204900	10.23
1/26/2018	1:34:01 AM	205200	10.23
1/26/2018	1:39:01 AM	205500	10.24
1/26/2018	1:44:01 AM	205800	10.23
1/26/2018	1:49:01 AM	206100	10.23
1/26/2018	1:54:01 AM	206400	10.23
1/26/2018	1:59:01 AM	206700	10.23
1/26/2018	2:04:01 AM	207000	10.23
1/26/2018	2:09:01 AM	207300	10.23
1/26/2018	2:14:01 AM	207600	10.23
1/26/2018	2:19:01 AM	207900	10.22
1/26/2018	2:24:01 AM	208200	10.21
1/26/2018	2:29:01 AM	208500	10.21
1/26/2018	2:34:01 AM	208800	10.2
1/26/2018	2:39:01 AM	209100	10.19
1/26/2018	2:44:01 AM	209400	10.21
1/26/2018	2:49:01 AM	209700	10.22
1/26/2018	2:54:01 AM	210000	10.22
1/26/2018	2:59:01 AM	210300	10.22
1/26/2018	3:04:01 AM	210600	10.22
1/26/2018	3:09:01 AM	210900	10.22

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/26/2018	3:14:01 AM	211200	10.22
1/26/2018	3:19:01 AM	211500	10.23
1/26/2018	3:24:01 AM	211800	10.22
1/26/2018	3:29:01 AM	212100	10.22
1/26/2018	3:34:01 AM	212400	10.23
1/26/2018	3:39:01 AM	212700	10.23
1/26/2018	3:44:01 AM	213000	10.23
1/26/2018	3:49:01 AM	213300	10.23
1/26/2018	3:54:01 AM	213600	10.23
1/26/2018	3:59:01 AM	213900	10.23
1/26/2018	4:04:01 AM	214200	10.24
1/26/2018	4:09:01 AM	214500	10.23
1/26/2018	4:14:01 AM	214800	10.23
1/26/2018	4:19:01 AM	215100	10.24
1/26/2018	4:24:01 AM	215400	10.24
1/26/2018	4:29:01 AM	215700	10.24
1/26/2018	4:34:01 AM	216000	10.24
1/26/2018	4:39:01 AM	216300	10.24
1/26/2018	4:44:01 AM	216600	10.24
1/26/2018	4:49:01 AM	216900	10.24
1/26/2018	4:54:01 AM	217200	10.24
1/26/2018	4:59:01 AM	217500	10.24
1/26/2018	5:04:01 AM	217800	10.25
1/26/2018	5:09:01 AM	218100	10.24
1/26/2018	5:14:01 AM	218400	10.25
1/26/2018	5:19:01 AM	218700	10.24
1/26/2018	5:24:01 AM	219000	10.24
1/26/2018	5:29:01 AM	219300	10.24
1/26/2018	5:34:01 AM	219600	10.24
1/26/2018	5:39:01 AM	219900	10.24
1/26/2018	5:44:01 AM	220200	10.24
1/26/2018	5:49:01 AM	220500	10.24
1/26/2018	5:54:01 AM	220800	10.24
1/26/2018	5:59:01 AM	221100	10.24
1/26/2018	6:04:01 AM	221400	10.24
1/26/2018	6:09:01 AM	221700	10.24
1/26/2018	6:14:01 AM	222000	10.24
1/26/2018	6:19:01 AM	222300	10.24
1/26/2018	6:24:01 AM	222600	10.24
1/26/2018	6:29:01 AM	222900	10.25
1/26/2018	6:34:01 AM	223200	10.25
1/26/2018	6:39:01 AM	223500	10.25
1/26/2018	6:44:01 AM	223800	10.25
1/26/2018	6:49:01 AM	224100	10.25

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/26/2018	6:54:01 AM	224400	10.25
1/26/2018	6:59:01 AM	224700	10.25
1/26/2018	7:04:01 AM	225000	10.25
1/26/2018	7:09:01 AM	225300	10.25
1/26/2018	7:14:01 AM	225600	10.25
1/26/2018	7:19:01 AM	225900	10.26
1/26/2018	7:24:01 AM	226200	10.26
1/26/2018	7:29:01 AM	226500	10.25
1/26/2018	7:34:01 AM	226800	10.26
1/26/2018	7:39:01 AM	227100	10.25
1/26/2018	7:44:01 AM	227400	10.25
1/26/2018	7:49:01 AM	227700	10.26
1/26/2018	7:54:01 AM	228000	10.25
1/26/2018	7:59:01 AM	228300	10.26
1/26/2018	8:04:01 AM	228600	10.26
1/26/2018	8:09:01 AM	228900	10.26
1/26/2018	8:14:01 AM	229200	10.26
1/26/2018	8:19:01 AM	229500	10.26
1/26/2018	8:24:01 AM	229800	10.26
1/26/2018	8:29:01 AM	230100	10.26
1/26/2018	8:34:01 AM	230400	10.26
1/26/2018	8:39:01 AM	230700	10.26
1/26/2018	8:44:01 AM	231000	10.25
1/26/2018	8:49:01 AM	231300	10.26
1/26/2018	8:54:01 AM	231600	10.26
1/26/2018	8:59:01 AM	231900	10.25
1/26/2018	9:04:01 AM	232200	10.26
1/26/2018	9:09:01 AM	232500	10.26
1/26/2018	9:14:01 AM	232800	10.26
1/26/2018	9:19:01 AM	233100	10.26
1/26/2018	9:24:01 AM	233400	10.27
1/26/2018	9:29:01 AM	233700	10.26
1/26/2018	9:34:01 AM	234000	10.26
1/26/2018	9:39:01 AM	234300	10.27
1/26/2018	9:44:01 AM	234600	10.26
1/26/2018	9:49:01 AM	234900	10.26
1/26/2018	9:54:01 AM	235200	10.26
1/26/2018	9:59:01 AM	235500	10.26
1/26/2018	10:04:01 AM	235800	10.27
1/26/2018	10:09:01 AM	236100	10.27
1/26/2018	10:14:01 AM	236400	10.27
1/26/2018	10:19:01 AM	236700	10.27
1/26/2018	10:24:01 AM	237000	10.27
1/26/2018	10:29:01 AM	237300	10.27

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/26/2018	10:34:01 AM	237600	10.28
1/26/2018	10:39:01 AM	237900	10.27
1/26/2018	10:44:01 AM	238200	10.27
1/26/2018	10:49:01 AM	238500	10.28
1/26/2018	10:54:01 AM	238800	10.28
1/26/2018	10:59:01 AM	239100	10.28
1/26/2018	11:04:01 AM	239400	10.28
1/26/2018	11:09:01 AM	239700	10.28
1/26/2018	11:14:01 AM	240000	10.28
1/26/2018	11:19:01 AM	240300	10.28
1/26/2018	11:24:01 AM	240600	10.28
1/26/2018	11:29:01 AM	240900	10.28
1/26/2018	11:34:01 AM	241200	10.28
1/26/2018	11:39:01 AM	241500	10.28
1/26/2018	11:44:01 AM	241800	10.28
1/26/2018	11:49:01 AM	242100	10.29
1/26/2018	11:54:01 AM	242400	10.29
1/26/2018	11:59:01 AM	242700	10.28
1/26/2018	12:04:01 PM	243000	10.28
1/26/2018	12:09:01 PM	243300	10.28
1/26/2018	12:14:01 PM	243600	10.28
1/26/2018	12:19:01 PM	243900	10.28
1/26/2018	12:24:01 PM	244200	10.29
1/26/2018	12:29:01 PM	244500	10.29
1/26/2018	12:34:01 PM	244800	10.29
1/26/2018	12:39:01 PM	245100	10.28
1/26/2018	12:44:01 PM	245400	10.28
1/26/2018	12:49:01 PM	245700	10.29
1/26/2018	12:54:01 PM	246000	10.28
1/26/2018	12:59:01 PM	246300	10.28
1/26/2018	1:04:01 PM	246600	10.29
1/26/2018	1:09:01 PM	246900	10.28
1/26/2018	1:14:01 PM	247200	10.29
1/26/2018	1:19:01 PM	247500	10.29
1/26/2018	1:24:01 PM	247800	10.29
1/26/2018	1:29:01 PM	248100	10.29
1/26/2018	1:34:01 PM	248400	10.29
1/26/2018	1:39:01 PM	248700	10.3
1/26/2018	1:44:01 PM	249000	10.3
1/26/2018	1:49:01 PM	249300	10.3
1/26/2018	1:54:01 PM	249600	10.3
1/26/2018	1:59:01 PM	249900	10.3
1/26/2018	2:04:01 PM	250200	10.3
1/26/2018	2:09:01 PM	250500	10.3

17PZ02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/26/2018	2:14:01 PM	250800	10.29
1/26/2018	2:19:01 PM	251100	10.3
1/26/2018	2:24:01 PM	251400	10.3
1/26/2018	2:29:01 PM	251700	10.3
1/26/2018	2:34:01 PM	252000	10.3
1/26/2018	2:39:01 PM	252300	10.3
1/26/2018	2:44:01 PM	252600	10.3
1/26/2018	2:49:01 PM	252900	10.3
1/26/2018	2:54:01 PM	253200	10.31
1/26/2018	2:59:01 PM	253500	10.31
1/26/2018	3:04:01 PM	253800	10.31
1/26/2018	3:09:01 PM	254100	10.31
1/26/2018	3:14:01 PM	254400	10.31
1/26/2018	3:19:01 PM	254700	10.32
1/26/2018	3:24:01 PM	255000	10.32
1/26/2018	3:29:01 PM	255300	10.31
1/26/2018	3:34:01 PM	255600	10.32
1/26/2018	3:39:01 PM	255900	10.32
1/26/2018	3:44:01 PM	256200	10.32
1/26/2018	3:49:01 PM	256500	10.33
1/26/2018	3:54:01 PM	256800	10.32
1/26/2018	3:59:01 PM	257100	10.32
1/26/2018	4:04:01 PM	257400	10.33
1/26/2018	4:09:01 PM	257700	10.33
1/26/2018	4:14:01 PM	258000	10.34
1/26/2018	4:19:01 PM	258300	10.33
1/26/2018	4:24:01 PM	258600	10.33
1/26/2018	4:29:01 PM	258900	10.34
1/26/2018	4:34:01 PM	259200	10.34
1/26/2018	4:39:01 PM	259500	10.34
1/26/2018	4:44:01 PM	259800	10.34
1/26/2018	4:49:01 PM	260100	10.35
1/26/2018	4:54:01 PM	260400	10.35
1/26/2018	4:59:01 PM	260700	10.35
1/26/2018	5:03:04 PM	260943	10.35

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/23/2018	4:34:01 PM	0	9.78
1/23/2018	4:39:01 PM	300	9.78
1/23/2018	4:44:01 PM	600	9.78
1/23/2018	4:49:01 PM	900	9.78
1/23/2018	4:54:01 PM	1200	9.78
1/23/2018	4:59:01 PM	1500	9.78
1/23/2018	5:04:01 PM	1800	9.79
1/23/2018	5:09:01 PM	2100	9.78
1/23/2018	5:14:01 PM	2400	9.79
1/23/2018	5:19:01 PM	2700	9.79
1/23/2018	5:24:01 PM	3000	9.8
1/23/2018	5:29:01 PM	3300	9.8
1/23/2018	5:34:01 PM	3600	9.8
1/23/2018	5:39:01 PM	3900	9.81
1/23/2018	5:44:01 PM	4200	9.81
1/23/2018	5:49:01 PM	4500	9.81
1/23/2018	5:54:01 PM	4800	9.81
1/23/2018	5:59:01 PM	5100	9.82
1/23/2018	6:04:01 PM	5400	9.82
1/23/2018	6:09:01 PM	5700	9.82
1/23/2018	6:14:01 PM	6000	9.83
1/23/2018	6:19:01 PM	6300	9.83
1/23/2018	6:24:01 PM	6600	9.83
1/23/2018	6:29:01 PM	6900	9.83
1/23/2018	6:34:01 PM	7200	9.83
1/23/2018	6:39:01 PM	7500	9.84
1/23/2018	6:44:01 PM	7800	9.84
1/23/2018	6:49:01 PM	8100	9.84
1/23/2018	6:54:01 PM	8400	9.84
1/23/2018	6:59:01 PM	8700	9.84
1/23/2018	7:04:01 PM	9000	9.85
1/23/2018	7:09:01 PM	9300	9.85
1/23/2018	7:14:01 PM	9600	9.85
1/23/2018	7:19:01 PM	9900	9.86
1/23/2018	7:24:01 PM	10200	9.86
1/23/2018	7:29:01 PM	10500	9.86
1/23/2018	7:34:01 PM	10800	9.86
1/23/2018	7:39:01 PM	11100	9.87
1/23/2018	7:44:01 PM	11400	9.86
1/23/2018	7:49:01 PM	11700	9.86
1/23/2018	7:54:01 PM	12000	9.86
1/23/2018	7:59:01 PM	12300	9.87
1/23/2018	8:04:01 PM	12600	9.87
1/23/2018	8:09:01 PM	12900	9.87
1/23/2018	8:14:01 PM	13200	9.87

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/23/2018	8:19:01 PM	13500	9.87
1/23/2018	8:24:01 PM	13800	9.87
1/23/2018	8:29:01 PM	14100	9.87
1/23/2018	8:34:01 PM	14400	9.87
1/23/2018	8:39:01 PM	14700	9.88
1/23/2018	8:44:01 PM	15000	9.88
1/23/2018	8:49:01 PM	15300	9.88
1/23/2018	8:54:01 PM	15600	9.88
1/23/2018	8:59:01 PM	15900	9.88
1/23/2018	9:04:01 PM	16200	9.88
1/23/2018	9:09:01 PM	16500	9.89
1/23/2018	9:14:01 PM	16800	9.88
1/23/2018	9:19:01 PM	17100	9.88
1/23/2018	9:24:01 PM	17400	9.88
1/23/2018	9:29:01 PM	17700	9.88
1/23/2018	9:34:01 PM	18000	9.88
1/23/2018	9:39:01 PM	18300	9.88
1/23/2018	9:44:01 PM	18600	9.88
1/23/2018	9:49:01 PM	18900	9.88
1/23/2018	9:54:01 PM	19200	9.88
1/23/2018	9:59:01 PM	19500	9.89
1/23/2018	10:04:01 PM	19800	9.89
1/23/2018	10:09:01 PM	20100	9.89
1/23/2018	10:14:01 PM	20400	9.89
1/23/2018	10:19:01 PM	20700	9.88
1/23/2018	10:24:01 PM	21000	9.89
1/23/2018	10:29:01 PM	21300	9.89
1/23/2018	10:34:01 PM	21600	9.89
1/23/2018	10:39:01 PM	21900	9.89
1/23/2018	10:44:01 PM	22200	9.89
1/23/2018	10:49:01 PM	22500	9.89
1/23/2018	10:54:01 PM	22800	9.88
1/23/2018	10:59:01 PM	23100	9.89
1/23/2018	11:04:01 PM	23400	9.89
1/23/2018	11:09:01 PM	23700	9.89
1/23/2018	11:14:01 PM	24000	9.89
1/23/2018	11:19:01 PM	24300	9.89
1/23/2018	11:24:01 PM	24600	9.89
1/23/2018	11:29:01 PM	24900	9.89
1/23/2018	11:34:01 PM	25200	9.89
1/23/2018	11:39:01 PM	25500	9.9
1/23/2018	11:44:01 PM	25800	9.89
1/23/2018	11:49:01 PM	26100	9.89
1/23/2018	11:54:01 PM	26400	9.89
1/23/2018	11:59:01 PM	26700	9.9

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	12:04:01 AM	27000	9.9
1/24/2018	12:09:01 AM	27300	9.9
1/24/2018	12:14:01 AM	27600	9.9
1/24/2018	12:19:01 AM	27900	9.9
1/24/2018	12:24:01 AM	28200	9.9
1/24/2018	12:29:01 AM	28500	9.9
1/24/2018	12:34:01 AM	28800	9.9
1/24/2018	12:39:01 AM	29100	9.9
1/24/2018	12:44:01 AM	29400	9.9
1/24/2018	12:49:01 AM	29700	9.9
1/24/2018	12:54:01 AM	30000	9.9
1/24/2018	12:59:01 AM	30300	9.9
1/24/2018	1:04:01 AM	30600	9.91
1/24/2018	1:09:01 AM	30900	9.9
1/24/2018	1:14:01 AM	31200	9.9
1/24/2018	1:19:01 AM	31500	9.91
1/24/2018	1:24:01 AM	31800	9.91
1/24/2018	1:29:01 AM	32100	9.91
1/24/2018	1:34:01 AM	32400	9.91
1/24/2018	1:39:01 AM	32700	9.9
1/24/2018	1:44:01 AM	33000	9.91
1/24/2018	1:49:01 AM	33300	9.91
1/24/2018	1:54:01 AM	33600	9.91
1/24/2018	1:59:01 AM	33900	9.91
1/24/2018	2:04:01 AM	34200	9.91
1/24/2018	2:09:01 AM	34500	9.92
1/24/2018	2:14:01 AM	34800	9.92
1/24/2018	2:19:01 AM	35100	9.92
1/24/2018	2:24:01 AM	35400	9.92
1/24/2018	2:29:01 AM	35700	9.92
1/24/2018	2:34:01 AM	36000	9.92
1/24/2018	2:39:01 AM	36300	9.92
1/24/2018	2:44:01 AM	36600	9.92
1/24/2018	2:49:01 AM	36900	9.92
1/24/2018	2:54:01 AM	37200	9.92
1/24/2018	2:59:01 AM	37500	9.92
1/24/2018	3:04:01 AM	37800	9.93
1/24/2018	3:09:01 AM	38100	9.92
1/24/2018	3:14:01 AM	38400	9.93
1/24/2018	3:19:01 AM	38700	9.93
1/24/2018	3:24:01 AM	39000	9.93
1/24/2018	3:29:01 AM	39300	9.93
1/24/2018	3:34:01 AM	39600	9.93
1/24/2018	3:39:01 AM	39900	9.93
1/24/2018	3:44:01 AM	40200	9.93

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	3:49:01 AM	40500	9.93
1/24/2018	3:54:01 AM	40800	9.93
1/24/2018	3:59:01 AM	41100	9.93
1/24/2018	4:04:01 AM	41400	9.94
1/24/2018	4:09:01 AM	41700	9.93
1/24/2018	4:14:01 AM	42000	9.93
1/24/2018	4:19:01 AM	42300	9.94
1/24/2018	4:24:01 AM	42600	9.94
1/24/2018	4:29:01 AM	42900	9.94
1/24/2018	4:34:01 AM	43200	9.94
1/24/2018	4:39:01 AM	43500	9.94
1/24/2018	4:44:01 AM	43800	9.94
1/24/2018	4:49:01 AM	44100	9.94
1/24/2018	4:54:01 AM	44400	9.93
1/24/2018	4:59:01 AM	44700	9.94
1/24/2018	5:04:01 AM	45000	9.94
1/24/2018	5:09:01 AM	45300	9.94
1/24/2018	5:14:01 AM	45600	9.94
1/24/2018	5:19:01 AM	45900	9.94
1/24/2018	5:24:01 AM	46200	9.94
1/24/2018	5:29:01 AM	46500	9.94
1/24/2018	5:34:01 AM	46800	9.94
1/24/2018	5:39:01 AM	47100	9.94
1/24/2018	5:44:01 AM	47400	9.94
1/24/2018	5:49:01 AM	47700	9.94
1/24/2018	5:54:01 AM	48000	9.94
1/24/2018	5:59:01 AM	48300	9.95
1/24/2018	6:04:01 AM	48600	9.94
1/24/2018	6:09:01 AM	48900	9.95
1/24/2018	6:14:01 AM	49200	9.94
1/24/2018	6:19:01 AM	49500	9.95
1/24/2018	6:24:01 AM	49800	9.95
1/24/2018	6:29:01 AM	50100	9.94
1/24/2018	6:34:01 AM	50400	9.95
1/24/2018	6:39:01 AM	50700	9.95
1/24/2018	6:44:01 AM	51000	9.95
1/24/2018	6:49:01 AM	51300	9.95
1/24/2018	6:54:01 AM	51600	9.95
1/24/2018	6:59:01 AM	51900	9.95
1/24/2018	7:04:01 AM	52200	9.95
1/24/2018	7:09:01 AM	52500	9.95
1/24/2018	7:14:01 AM	52800	9.95
1/24/2018	7:19:01 AM	53100	9.95
1/24/2018	7:24:01 AM	53400	9.95
1/24/2018	7:29:01 AM	53700	9.96

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	7:34:01 AM	54000	9.96
1/24/2018	7:39:01 AM	54300	9.96
1/24/2018	7:44:01 AM	54600	9.96
1/24/2018	7:49:01 AM	54900	9.96
1/24/2018	7:54:01 AM	55200	9.96
1/24/2018	7:59:01 AM	55500	9.96
1/24/2018	8:04:01 AM	55800	9.96
1/24/2018	8:09:01 AM	56100	9.96
1/24/2018	8:14:01 AM	56400	9.96
1/24/2018	8:19:01 AM	56700	9.97
1/24/2018	8:24:01 AM	57000	9.96
1/24/2018	8:29:01 AM	57300	9.97
1/24/2018	8:34:01 AM	57600	9.97
1/24/2018	8:39:01 AM	57900	9.96
1/24/2018	8:44:01 AM	58200	9.97
1/24/2018	8:49:01 AM	58500	9.97
1/24/2018	8:54:01 AM	58800	9.97
1/24/2018	8:59:01 AM	59100	9.97
1/24/2018	9:04:01 AM	59400	9.97
1/24/2018	9:09:01 AM	59700	9.98
1/24/2018	9:14:01 AM	60000	9.97
1/24/2018	9:19:01 AM	60300	9.98
1/24/2018	9:24:01 AM	60600	9.98
1/24/2018	9:29:01 AM	60900	9.97
1/24/2018	9:34:01 AM	61200	9.98
1/24/2018	9:39:01 AM	61500	9.98
1/24/2018	9:44:01 AM	61800	9.98
1/24/2018	9:49:01 AM	62100	9.98
1/24/2018	9:54:01 AM	62400	9.98
1/24/2018	9:59:01 AM	62700	9.98
1/24/2018	10:04:01 AM	63000	9.98
1/24/2018	10:09:01 AM	63300	9.98
1/24/2018	10:14:01 AM	63600	9.98
1/24/2018	10:19:01 AM	63900	9.98
1/24/2018	10:24:01 AM	64200	9.98
1/24/2018	10:29:01 AM	64500	9.98
1/24/2018	10:34:01 AM	64800	9.98
1/24/2018	10:39:01 AM	65100	9.99
1/24/2018	10:44:01 AM	65400	9.98
1/24/2018	10:49:01 AM	65700	9.98
1/24/2018	10:54:01 AM	66000	9.98
1/24/2018	10:59:01 AM	66300	9.98
1/24/2018	11:04:01 AM	66600	9.98
1/24/2018	11:09:01 AM	66900	9.98
1/24/2018	11:14:01 AM	67200	9.97

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	11:19:01 AM	67500	9.98
1/24/2018	11:24:01 AM	67800	9.98
1/24/2018	11:29:01 AM	68100	9.97
1/24/2018	11:34:01 AM	68400	9.97
1/24/2018	11:39:01 AM	68700	9.96
1/24/2018	11:44:01 AM	69000	9.96
1/24/2018	11:49:01 AM	69300	9.96
1/24/2018	11:54:01 AM	69600	9.97
1/24/2018	11:59:01 AM	69900	9.97
1/24/2018	12:04:01 PM	70200	9.96
1/24/2018	12:09:01 PM	70500	9.96
1/24/2018	12:14:01 PM	70800	9.96
1/24/2018	12:19:01 PM	71100	9.96
1/24/2018	12:24:01 PM	71400	9.95
1/24/2018	12:29:01 PM	71700	9.96
1/24/2018	12:34:01 PM	72000	9.96
1/24/2018	12:39:01 PM	72300	9.95
1/24/2018	12:44:01 PM	72600	9.95
1/24/2018	12:49:01 PM	72900	9.94
1/24/2018	12:54:01 PM	73200	9.95
1/24/2018	12:59:01 PM	73500	9.95
1/24/2018	1:04:01 PM	73800	9.95
1/24/2018	1:09:01 PM	74100	9.95
1/24/2018	1:14:01 PM	74400	9.95
1/24/2018	1:19:01 PM	74700	9.94
1/24/2018	1:24:01 PM	75000	9.95
1/24/2018	1:29:01 PM	75300	9.94
1/24/2018	1:34:01 PM	75600	9.94
1/24/2018	1:39:01 PM	75900	9.94
1/24/2018	1:44:01 PM	76200	9.95
1/24/2018	1:49:01 PM	76500	9.94
1/24/2018	1:54:01 PM	76800	9.93
1/24/2018	1:59:01 PM	77100	9.93
1/24/2018	2:04:01 PM	77400	9.93
1/24/2018	2:09:01 PM	77700	9.94
1/24/2018	2:14:01 PM	78000	9.93
1/24/2018	2:19:01 PM	78300	9.93
1/24/2018	2:24:01 PM	78600	9.94
1/24/2018	2:29:01 PM	78900	9.93
1/24/2018	2:34:01 PM	79200	9.93
1/24/2018	2:39:01 PM	79500	9.93
1/24/2018	2:44:01 PM	79800	9.93
1/24/2018	2:49:01 PM	80100	9.93
1/24/2018	2:54:01 PM	80400	9.93
1/24/2018	2:59:01 PM	80700	9.93

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	3:04:01 PM	81000	9.93
1/24/2018	3:09:01 PM	81300	9.93
1/24/2018	3:14:01 PM	81600	9.93
1/24/2018	3:19:01 PM	81900	9.93
1/24/2018	3:24:01 PM	82200	9.94
1/24/2018	3:29:01 PM	82500	9.94
1/24/2018	3:34:01 PM	82800	9.93
1/24/2018	3:39:01 PM	83100	9.94
1/24/2018	3:44:01 PM	83400	9.94
1/24/2018	3:49:01 PM	83700	9.94
1/24/2018	3:54:01 PM	84000	9.93
1/24/2018	3:59:01 PM	84300	9.94
1/24/2018	4:04:01 PM	84600	9.94
1/24/2018	4:09:01 PM	84900	9.94
1/24/2018	4:14:01 PM	85200	9.94
1/24/2018	4:19:01 PM	85500	9.94
1/24/2018	4:24:01 PM	85800	9.94
1/24/2018	4:29:01 PM	86100	9.93
1/24/2018	4:34:01 PM	86400	9.94
1/24/2018	4:39:01 PM	86700	9.93
1/24/2018	4:44:01 PM	87000	9.93
1/24/2018	4:49:01 PM	87300	9.94
1/24/2018	4:54:01 PM	87600	9.93
1/24/2018	4:59:01 PM	87900	9.94
1/24/2018	5:04:01 PM	88200	9.94
1/24/2018	5:09:01 PM	88500	9.94
1/24/2018	5:14:01 PM	88800	9.94
1/24/2018	5:19:01 PM	89100	9.94
1/24/2018	5:24:01 PM	89400	9.93
1/24/2018	5:29:01 PM	89700	9.94
1/24/2018	5:34:01 PM	90000	9.94
1/24/2018	5:39:01 PM	90300	9.94
1/24/2018	5:44:01 PM	90600	9.94
1/24/2018	5:49:01 PM	90900	9.95
1/24/2018	5:54:01 PM	91200	9.95
1/24/2018	5:59:01 PM	91500	9.95
1/24/2018	6:04:01 PM	91800	9.95
1/24/2018	6:09:01 PM	92100	9.95
1/24/2018	6:14:01 PM	92400	9.95
1/24/2018	6:19:01 PM	92700	9.95
1/24/2018	6:24:01 PM	93000	9.95
1/24/2018	6:29:01 PM	93300	9.95
1/24/2018	6:34:01 PM	93600	9.95
1/24/2018	6:39:01 PM	93900	9.95
1/24/2018	6:44:01 PM	94200	9.95

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	6:49:01 PM	94500	9.96
1/24/2018	6:54:01 PM	94800	9.96
1/24/2018	6:59:01 PM	95100	9.95
1/24/2018	7:04:01 PM	95400	9.96
1/24/2018	7:09:01 PM	95700	9.96
1/24/2018	7:14:01 PM	96000	9.96
1/24/2018	7:19:01 PM	96300	9.96
1/24/2018	7:24:01 PM	96600	9.96
1/24/2018	7:29:01 PM	96900	9.96
1/24/2018	7:34:01 PM	97200	9.96
1/24/2018	7:39:01 PM	97500	9.96
1/24/2018	7:44:01 PM	97800	9.96
1/24/2018	7:49:01 PM	98100	9.96
1/24/2018	7:54:01 PM	98400	9.96
1/24/2018	7:59:01 PM	98700	9.96
1/24/2018	8:04:01 PM	99000	9.96
1/24/2018	8:09:01 PM	99300	9.96
1/24/2018	8:14:01 PM	99600	9.96
1/24/2018	8:19:01 PM	99900	9.96
1/24/2018	8:24:01 PM	100200	9.96
1/24/2018	8:29:01 PM	100500	9.96
1/24/2018	8:34:01 PM	100800	9.96
1/24/2018	8:39:01 PM	101100	9.96
1/24/2018	8:44:01 PM	101400	9.96
1/24/2018	8:49:01 PM	101700	9.96
1/24/2018	8:54:01 PM	102000	9.96
1/24/2018	8:59:01 PM	102300	9.96
1/24/2018	9:04:01 PM	102600	9.97
1/24/2018	9:09:01 PM	102900	9.97
1/24/2018	9:14:01 PM	103200	9.97
1/24/2018	9:19:01 PM	103500	9.97
1/24/2018	9:24:01 PM	103800	9.96
1/24/2018	9:29:01 PM	104100	9.96
1/24/2018	9:34:01 PM	104400	9.97
1/24/2018	9:39:01 PM	104700	9.97
1/24/2018	9:44:01 PM	105000	9.97
1/24/2018	9:49:01 PM	105300	9.97
1/24/2018	9:54:01 PM	105600	9.97
1/24/2018	9:59:01 PM	105900	9.97
1/24/2018	10:04:01 PM	106200	9.97
1/24/2018	10:09:01 PM	106500	9.97
1/24/2018	10:14:01 PM	106800	9.97
1/24/2018	10:19:01 PM	107100	9.97
1/24/2018	10:24:01 PM	107400	9.97
1/24/2018	10:29:01 PM	107700	9.97

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/24/2018	10:34:01 PM	108000	9.97
1/24/2018	10:39:01 PM	108300	9.97
1/24/2018	10:44:01 PM	108600	9.98
1/24/2018	10:49:01 PM	108900	9.97
1/24/2018	10:54:01 PM	109200	9.97
1/24/2018	10:59:01 PM	109500	9.97
1/24/2018	11:04:01 PM	109800	9.97
1/24/2018	11:09:01 PM	110100	9.97
1/24/2018	11:14:01 PM	110400	9.97
1/24/2018	11:19:01 PM	110700	9.97
1/24/2018	11:24:01 PM	111000	9.97
1/24/2018	11:29:01 PM	111300	9.97
1/24/2018	11:34:01 PM	111600	9.97
1/24/2018	11:39:01 PM	111900	9.97
1/24/2018	11:44:01 PM	112200	9.97
1/24/2018	11:49:01 PM	112500	9.97
1/24/2018	11:54:01 PM	112800	9.97
1/24/2018	11:59:01 PM	113100	9.97
1/25/2018	12:04:01 AM	113400	9.97
1/25/2018	12:09:01 AM	113700	9.97
1/25/2018	12:14:01 AM	114000	9.97
1/25/2018	12:19:01 AM	114300	9.97
1/25/2018	12:24:01 AM	114600	9.97
1/25/2018	12:29:01 AM	114900	9.97
1/25/2018	12:34:01 AM	115200	9.97
1/25/2018	12:39:01 AM	115500	9.97
1/25/2018	12:44:01 AM	115800	9.97
1/25/2018	12:49:01 AM	116100	9.97
1/25/2018	12:54:01 AM	116400	9.97
1/25/2018	12:59:01 AM	116700	9.97
1/25/2018	1:04:01 AM	117000	9.97
1/25/2018	1:09:01 AM	117300	9.97
1/25/2018	1:14:01 AM	117600	9.97
1/25/2018	1:19:01 AM	117900	9.97
1/25/2018	1:24:01 AM	118200	9.96
1/25/2018	1:29:01 AM	118500	9.97
1/25/2018	1:34:01 AM	118800	9.97
1/25/2018	1:39:01 AM	119100	9.97
1/25/2018	1:44:01 AM	119400	9.96
1/25/2018	1:49:01 AM	119700	9.97
1/25/2018	1:54:01 AM	120000	9.97
1/25/2018	1:59:01 AM	120300	9.97
1/25/2018	2:04:01 AM	120600	9.97
1/25/2018	2:09:01 AM	120900	9.97
1/25/2018	2:14:01 AM	121200	9.97

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/25/2018	2:19:01 AM	121500	9.96
1/25/2018	2:24:01 AM	121800	9.97
1/25/2018	2:29:01 AM	122100	9.97
1/25/2018	2:34:01 AM	122400	9.97
1/25/2018	2:39:01 AM	122700	9.97
1/25/2018	2:44:01 AM	123000	9.96
1/25/2018	2:49:01 AM	123300	9.97
1/25/2018	2:54:01 AM	123600	9.97
1/25/2018	2:59:01 AM	123900	9.97
1/25/2018	3:04:01 AM	124200	9.97
1/25/2018	3:09:01 AM	124500	9.97
1/25/2018	3:14:01 AM	124800	9.97
1/25/2018	3:19:01 AM	125100	9.97
1/25/2018	3:24:01 AM	125400	9.97
1/25/2018	3:29:01 AM	125700	9.97
1/25/2018	3:34:01 AM	126000	9.97
1/25/2018	3:39:01 AM	126300	9.97
1/25/2018	3:44:01 AM	126600	9.97
1/25/2018	3:49:01 AM	126900	9.97
1/25/2018	3:54:01 AM	127200	9.97
1/25/2018	3:59:01 AM	127500	9.97
1/25/2018	4:04:01 AM	127800	9.97
1/25/2018	4:09:01 AM	128100	9.97
1/25/2018	4:14:01 AM	128400	9.97
1/25/2018	4:19:01 AM	128700	9.97
1/25/2018	4:24:01 AM	129000	9.97
1/25/2018	4:29:01 AM	129300	9.97
1/25/2018	4:34:01 AM	129600	9.97
1/25/2018	4:39:01 AM	129900	9.97
1/25/2018	4:44:01 AM	130200	9.97
1/25/2018	4:49:01 AM	130500	9.97
1/25/2018	4:54:01 AM	130800	9.97
1/25/2018	4:59:01 AM	131100	9.97
1/25/2018	5:04:01 AM	131400	9.97
1/25/2018	5:09:01 AM	131700	9.97
1/25/2018	5:14:01 AM	132000	9.97
1/25/2018	5:19:01 AM	132300	9.97
1/25/2018	5:24:01 AM	132600	9.98
1/25/2018	5:29:01 AM	132900	9.97
1/25/2018	5:34:01 AM	133200	9.97
1/25/2018	5:39:01 AM	133500	9.98
1/25/2018	5:44:01 AM	133800	9.98
1/25/2018	5:49:01 AM	134100	9.98
1/25/2018	5:54:01 AM	134400	9.97
1/25/2018	5:59:01 AM	134700	9.98

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/25/2018	6:04:01 AM	135000	9.98
1/25/2018	6:09:01 AM	135300	9.98
1/25/2018	6:14:01 AM	135600	9.98
1/25/2018	6:19:01 AM	135900	9.98
1/25/2018	6:24:01 AM	136200	9.98
1/25/2018	6:29:01 AM	136500	9.98
1/25/2018	6:34:01 AM	136800	9.98
1/25/2018	6:39:01 AM	137100	9.98
1/25/2018	6:44:01 AM	137400	9.98
1/25/2018	6:49:01 AM	137700	9.98
1/25/2018	6:54:01 AM	138000	9.98
1/25/2018	6:59:01 AM	138300	9.99
1/25/2018	7:04:01 AM	138600	9.99
1/25/2018	7:09:01 AM	138900	9.98
1/25/2018	7:14:01 AM	139200	9.99
1/25/2018	7:19:01 AM	139500	9.98
1/25/2018	7:24:01 AM	139800	9.98
1/25/2018	7:29:01 AM	140100	9.99
1/25/2018	7:34:01 AM	140400	9.98
1/25/2018	7:39:01 AM	140700	9.99
1/25/2018	7:44:01 AM	141000	9.98
1/25/2018	7:49:01 AM	141300	9.99
1/25/2018	7:54:01 AM	141600	9.99
1/25/2018	7:59:01 AM	141900	9.99
1/25/2018	8:04:01 AM	142200	9.99
1/25/2018	8:09:01 AM	142500	9.99
1/25/2018	8:14:01 AM	142800	9.99
1/25/2018	8:19:01 AM	143100	9.99
1/25/2018	8:24:01 AM	143400	9.99
1/25/2018	8:29:01 AM	143700	10
1/25/2018	8:34:01 AM	144000	10
1/25/2018	8:39:01 AM	144300	9.99
1/25/2018	8:44:01 AM	144600	10
1/25/2018	8:49:01 AM	144900	10
1/25/2018	8:54:01 AM	145200	9.99
1/25/2018	8:59:01 AM	145500	10
1/25/2018	9:04:01 AM	145800	10
1/25/2018	9:09:01 AM	146100	10
1/25/2018	9:14:01 AM	146400	9.99
1/25/2018	9:19:01 AM	146700	10
1/25/2018	9:24:01 AM	147000	10
1/25/2018	9:29:01 AM	147300	10
1/25/2018	9:34:01 AM	147600	10
1/25/2018	9:39:01 AM	147900	9.99
1/25/2018	9:44:01 AM	148200	10

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/25/2018	9:49:01 AM	148500	10.01
1/25/2018	9:54:01 AM	148800	10
1/25/2018	9:59:01 AM	149100	10.01
1/25/2018	10:04:01 AM	149400	10
1/25/2018	10:09:01 AM	149700	10
1/25/2018	10:14:01 AM	150000	10
1/25/2018	10:19:01 AM	150300	10
1/25/2018	10:24:01 AM	150600	10
1/25/2018	10:29:01 AM	150900	10
1/25/2018	10:34:01 AM	151200	10.01
1/25/2018	10:39:01 AM	151500	10
1/25/2018	10:44:01 AM	151800	10
1/25/2018	10:49:01 AM	152100	9.99
1/25/2018	10:54:01 AM	152400	10
1/25/2018	10:59:01 AM	152700	10
1/25/2018	11:04:01 AM	153000	9.99
1/25/2018	11:09:01 AM	153300	10
1/25/2018	11:14:01 AM	153600	9.99
1/25/2018	11:19:01 AM	153900	10
1/25/2018	11:24:01 AM	154200	9.99
1/25/2018	11:29:01 AM	154500	9.99
1/25/2018	11:34:01 AM	154800	9.99
1/25/2018	11:39:01 AM	155100	9.99
1/25/2018	11:44:01 AM	155400	9.98
1/25/2018	11:49:01 AM	155700	9.99
1/25/2018	11:54:01 AM	156000	9.98
1/25/2018	11:59:01 AM	156300	9.98
1/25/2018	12:04:01 PM	156600	9.98
1/25/2018	12:09:01 PM	156900	9.96
1/25/2018	12:14:01 PM	157200	9.98
1/25/2018	12:19:01 PM	157500	9.98
1/25/2018	12:24:01 PM	157800	9.99
1/25/2018	12:29:01 PM	158100	9.97
1/25/2018	12:34:01 PM	158400	9.98
1/25/2018	12:39:01 PM	158700	9.97
1/25/2018	12:44:01 PM	159000	9.98
1/25/2018	12:49:01 PM	159300	9.97
1/25/2018	12:54:01 PM	159600	9.96
1/25/2018	12:59:01 PM	159900	9.97
1/25/2018	1:04:01 PM	160200	9.97
1/25/2018	1:09:01 PM	160500	9.97
1/25/2018	1:14:01 PM	160800	9.96
1/25/2018	1:19:01 PM	161100	9.96
1/25/2018	1:24:01 PM	161400	9.96
1/25/2018	1:29:01 PM	161700	9.96

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/25/2018	1:34:01 PM	162000	9.95
1/25/2018	1:39:01 PM	162300	9.96
1/25/2018	1:44:01 PM	162600	9.96
1/25/2018	1:49:01 PM	162900	9.96
1/25/2018	1:54:01 PM	163200	9.96
1/25/2018	1:59:01 PM	163500	9.96
1/25/2018	2:04:01 PM	163800	9.95
1/25/2018	2:09:01 PM	164100	9.95
1/25/2018	2:14:01 PM	164400	9.96
1/25/2018	2:19:01 PM	164700	9.95
1/25/2018	2:24:01 PM	165000	9.95
1/25/2018	2:29:01 PM	165300	9.95
1/25/2018	2:34:01 PM	165600	9.95
1/25/2018	2:39:01 PM	165900	9.94
1/25/2018	2:44:01 PM	166200	9.95
1/25/2018	2:49:01 PM	166500	9.95
1/25/2018	2:54:01 PM	166800	9.94
1/25/2018	2:59:01 PM	167100	9.95
1/25/2018	3:04:01 PM	167400	9.95
1/25/2018	3:09:01 PM	167700	9.95
1/25/2018	3:14:01 PM	168000	9.95
1/25/2018	3:19:01 PM	168300	9.95
1/25/2018	3:24:01 PM	168600	9.94
1/25/2018	3:29:01 PM	168900	9.95
1/25/2018	3:34:01 PM	169200	9.94
1/25/2018	3:39:01 PM	169500	9.94
1/25/2018	3:44:01 PM	169800	9.94
1/25/2018	3:49:01 PM	170100	9.95
1/25/2018	3:54:01 PM	170400	9.94
1/25/2018	3:59:01 PM	170700	9.94
1/25/2018	4:04:01 PM	171000	9.94
1/25/2018	4:09:01 PM	171300	9.94
1/25/2018	4:14:01 PM	171600	9.93
1/25/2018	4:19:01 PM	171900	9.93
1/25/2018	4:24:01 PM	172200	9.94
1/25/2018	4:29:01 PM	172500	9.94
1/25/2018	4:34:01 PM	172800	9.94
1/25/2018	4:39:01 PM	173100	9.94
1/25/2018	4:44:01 PM	173400	9.94
1/25/2018	4:49:01 PM	173700	9.94
1/25/2018	4:54:01 PM	174000	9.94
1/25/2018	4:59:01 PM	174300	9.94
1/25/2018	5:04:01 PM	174600	9.94
1/25/2018	5:09:01 PM	174900	9.94
1/25/2018	5:14:01 PM	175200	9.94

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/25/2018	5:19:01 PM	175500	9.95
1/25/2018	5:24:01 PM	175800	9.94
1/25/2018	5:29:01 PM	176100	9.94
1/25/2018	5:34:01 PM	176400	9.94
1/25/2018	5:39:01 PM	176700	9.94
1/25/2018	5:44:01 PM	177000	9.94
1/25/2018	5:49:01 PM	177300	9.94
1/25/2018	5:54:01 PM	177600	9.95
1/25/2018	5:59:01 PM	177900	9.95
1/25/2018	6:04:01 PM	178200	9.95
1/25/2018	6:09:01 PM	178500	9.95
1/25/2018	6:14:01 PM	178800	9.96
1/25/2018	6:19:01 PM	179100	9.95
1/25/2018	6:24:01 PM	179400	9.96
1/25/2018	6:29:01 PM	179700	9.95
1/25/2018	6:34:01 PM	180000	9.96
1/25/2018	6:39:01 PM	180300	9.95
1/25/2018	6:44:01 PM	180600	9.96
1/25/2018	6:49:01 PM	180900	9.96
1/25/2018	6:54:01 PM	181200	9.96
1/25/2018	6:59:01 PM	181500	9.96
1/25/2018	7:04:01 PM	181800	9.96
1/25/2018	7:09:01 PM	182100	9.96
1/25/2018	7:14:01 PM	182400	9.96
1/25/2018	7:19:01 PM	182700	9.96
1/25/2018	7:24:01 PM	183000	9.96
1/25/2018	7:29:01 PM	183300	9.96
1/25/2018	7:34:01 PM	183600	9.96
1/25/2018	7:39:01 PM	183900	9.97
1/25/2018	7:44:01 PM	184200	9.97
1/25/2018	7:49:01 PM	184500	9.97
1/25/2018	7:54:01 PM	184800	9.97
1/25/2018	7:59:01 PM	185100	9.97
1/25/2018	8:04:01 PM	185400	9.97
1/25/2018	8:09:01 PM	185700	9.97
1/25/2018	8:14:01 PM	186000	9.97
1/25/2018	8:19:01 PM	186300	9.97
1/25/2018	8:24:01 PM	186600	9.97
1/25/2018	8:29:01 PM	186900	9.97
1/25/2018	8:34:01 PM	187200	9.97
1/25/2018	8:39:01 PM	187500	9.97
1/25/2018	8:44:01 PM	187800	9.98
1/25/2018	8:49:01 PM	188100	9.98
1/25/2018	8:54:01 PM	188400	9.98
1/25/2018	8:59:01 PM	188700	9.98

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/25/2018	9:04:01 PM	189000	9.98
1/25/2018	9:09:01 PM	189300	9.98
1/25/2018	9:14:01 PM	189600	9.98
1/25/2018	9:19:01 PM	189900	9.98
1/25/2018	9:24:01 PM	190200	9.98
1/25/2018	9:29:01 PM	190500	9.98
1/25/2018	9:34:01 PM	190800	9.98
1/25/2018	9:39:01 PM	191100	9.98
1/25/2018	9:44:01 PM	191400	9.98
1/25/2018	9:49:01 PM	191700	9.98
1/25/2018	9:54:01 PM	192000	9.98
1/25/2018	9:59:01 PM	192300	9.98
1/25/2018	10:04:01 PM	192600	9.98
1/25/2018	10:09:01 PM	192900	9.98
1/25/2018	10:14:01 PM	193200	9.98
1/25/2018	10:19:01 PM	193500	9.98
1/25/2018	10:24:01 PM	193800	9.98
1/25/2018	10:29:01 PM	194100	9.98
1/25/2018	10:34:01 PM	194400	9.98
1/25/2018	10:39:01 PM	194700	9.98
1/25/2018	10:44:01 PM	195000	9.98
1/25/2018	10:49:01 PM	195300	9.98
1/25/2018	10:54:01 PM	195600	9.98
1/25/2018	10:59:01 PM	195900	9.98
1/25/2018	11:04:01 PM	196200	9.99
1/25/2018	11:09:01 PM	196500	9.99
1/25/2018	11:14:01 PM	196800	9.99
1/25/2018	11:19:01 PM	197100	9.99
1/25/2018	11:24:01 PM	197400	9.99
1/25/2018	11:29:01 PM	197700	9.99
1/25/2018	11:34:01 PM	198000	9.99
1/25/2018	11:39:01 PM	198300	9.99
1/25/2018	11:44:01 PM	198600	9.98
1/25/2018	11:49:01 PM	198900	9.99
1/25/2018	11:54:01 PM	199200	9.98
1/25/2018	11:59:01 PM	199500	9.99
1/26/2018	12:04:01 AM	199800	9.99
1/26/2018	12:09:01 AM	200100	9.99
1/26/2018	12:14:01 AM	200400	9.99
1/26/2018	12:19:01 AM	200700	9.99
1/26/2018	12:24:01 AM	201000	9.99
1/26/2018	12:29:01 AM	201300	9.99
1/26/2018	12:34:01 AM	201600	9.99
1/26/2018	12:39:01 AM	201900	9.99
1/26/2018	12:44:01 AM	202200	9.99

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	12:49:01 AM	202500	9.99
1/26/2018	12:54:01 AM	202800	9.99
1/26/2018	12:59:01 AM	203100	9.99
1/26/2018	1:04:01 AM	203400	9.99
1/26/2018	1:09:01 AM	203700	9.99
1/26/2018	1:14:01 AM	204000	9.99
1/26/2018	1:19:01 AM	204300	9.99
1/26/2018	1:24:01 AM	204600	9.99
1/26/2018	1:29:01 AM	204900	9.99
1/26/2018	1:34:01 AM	205200	9.99
1/26/2018	1:39:01 AM	205500	9.99
1/26/2018	1:44:01 AM	205800	9.99
1/26/2018	1:49:01 AM	206100	9.98
1/26/2018	1:54:01 AM	206400	9.98
1/26/2018	1:59:01 AM	206700	9.99
1/26/2018	2:04:01 AM	207000	9.99
1/26/2018	2:09:01 AM	207300	9.99
1/26/2018	2:14:01 AM	207600	9.99
1/26/2018	2:19:01 AM	207900	9.99
1/26/2018	2:24:01 AM	208200	9.98
1/26/2018	2:29:01 AM	208500	9.99
1/26/2018	2:34:01 AM	208800	9.98
1/26/2018	2:39:01 AM	209100	9.98
1/26/2018	2:44:01 AM	209400	9.98
1/26/2018	2:49:01 AM	209700	9.98
1/26/2018	2:54:01 AM	210000	9.98
1/26/2018	2:59:01 AM	210300	9.98
1/26/2018	3:04:01 AM	210600	9.98
1/26/2018	3:09:01 AM	210900	9.98
1/26/2018	3:14:01 AM	211200	9.98
1/26/2018	3:19:01 AM	211500	9.98
1/26/2018	3:24:01 AM	211800	9.99
1/26/2018	3:29:01 AM	212100	9.99
1/26/2018	3:34:01 AM	212400	9.99
1/26/2018	3:39:01 AM	212700	9.99
1/26/2018	3:44:01 AM	213000	9.99
1/26/2018	3:49:01 AM	213300	9.99
1/26/2018	3:54:01 AM	213600	9.99
1/26/2018	3:59:01 AM	213900	9.99
1/26/2018	4:04:01 AM	214200	9.99
1/26/2018	4:09:01 AM	214500	9.99
1/26/2018	4:14:01 AM	214800	9.99
1/26/2018	4:19:01 AM	215100	9.99
1/26/2018	4:24:01 AM	215400	9.99
1/26/2018	4:29:01 AM	215700	9.99

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	4:34:01 AM	216000	9.99
1/26/2018	4:39:01 AM	216300	9.99
1/26/2018	4:44:01 AM	216600	9.99
1/26/2018	4:49:01 AM	216900	10
1/26/2018	4:54:01 AM	217200	10
1/26/2018	4:59:01 AM	217500	9.99
1/26/2018	5:04:01 AM	217800	9.99
1/26/2018	5:09:01 AM	218100	10
1/26/2018	5:14:01 AM	218400	10
1/26/2018	5:19:01 AM	218700	10
1/26/2018	5:24:01 AM	219000	10
1/26/2018	5:29:01 AM	219300	10
1/26/2018	5:34:01 AM	219600	10
1/26/2018	5:39:01 AM	219900	9.99
1/26/2018	5:44:01 AM	220200	10
1/26/2018	5:49:01 AM	220500	10
1/26/2018	5:54:01 AM	220800	10
1/26/2018	5:59:01 AM	221100	10
1/26/2018	6:04:01 AM	221400	10
1/26/2018	6:09:01 AM	221700	10
1/26/2018	6:14:01 AM	222000	10
1/26/2018	6:19:01 AM	222300	10
1/26/2018	6:24:01 AM	222600	10
1/26/2018	6:29:01 AM	222900	10
1/26/2018	6:34:01 AM	223200	10
1/26/2018	6:39:01 AM	223500	10
1/26/2018	6:44:01 AM	223800	10
1/26/2018	6:49:01 AM	224100	10
1/26/2018	6:54:01 AM	224400	10
1/26/2018	6:59:01 AM	224700	10
1/26/2018	7:04:01 AM	225000	10.01
1/26/2018	7:09:01 AM	225300	10.01
1/26/2018	7:14:01 AM	225600	10.01
1/26/2018	7:19:01 AM	225900	10.01
1/26/2018	7:24:01 AM	226200	10.01
1/26/2018	7:29:01 AM	226500	10.01
1/26/2018	7:34:01 AM	226800	10.01
1/26/2018	7:39:01 AM	227100	10.01
1/26/2018	7:44:01 AM	227400	10.01
1/26/2018	7:49:01 AM	227700	10
1/26/2018	7:54:01 AM	228000	10.01
1/26/2018	7:59:01 AM	228300	10.01
1/26/2018	8:04:01 AM	228600	10.01
1/26/2018	8:09:01 AM	228900	10.01
1/26/2018	8:14:01 AM	229200	10.02

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	8:19:01 AM	229500	10.01
1/26/2018	8:24:01 AM	229800	10.02
1/26/2018	8:29:01 AM	230100	10.02
1/26/2018	8:34:01 AM	230400	10.02
1/26/2018	8:39:01 AM	230700	10.02
1/26/2018	8:44:01 AM	231000	10.01
1/26/2018	8:49:01 AM	231300	10.02
1/26/2018	8:54:01 AM	231600	10.02
1/26/2018	8:59:01 AM	231900	10.02
1/26/2018	9:04:01 AM	232200	10.01
1/26/2018	9:09:01 AM	232500	10.02
1/26/2018	9:14:01 AM	232800	10.01
1/26/2018	9:19:01 AM	233100	10.01
1/26/2018	9:24:01 AM	233400	10.03
1/26/2018	9:29:01 AM	233700	10.01
1/26/2018	9:34:01 AM	234000	10.02
1/26/2018	9:39:01 AM	234300	10.01
1/26/2018	9:44:01 AM	234600	10.02
1/26/2018	9:49:01 AM	234900	10.01
1/26/2018	9:54:01 AM	235200	10.02
1/26/2018	9:59:01 AM	235500	10.02
1/26/2018	10:04:01 AM	235800	10.02
1/26/2018	10:09:01 AM	236100	10.02
1/26/2018	10:14:01 AM	236400	10.02
1/26/2018	10:19:01 AM	236700	10.02
1/26/2018	10:24:01 AM	237000	10.02
1/26/2018	10:29:01 AM	237300	10.03
1/26/2018	10:34:01 AM	237600	10.03
1/26/2018	10:39:01 AM	237900	10.03
1/26/2018	10:44:01 AM	238200	10.02
1/26/2018	10:49:01 AM	238500	10.03
1/26/2018	10:54:01 AM	238800	10.03
1/26/2018	10:59:01 AM	239100	10.03
1/26/2018	11:04:01 AM	239400	10.03
1/26/2018	11:09:01 AM	239700	10.03
1/26/2018	11:14:01 AM	240000	10.03
1/26/2018	11:19:01 AM	240300	10.02
1/26/2018	11:24:01 AM	240600	10.03
1/26/2018	11:29:01 AM	240900	10.03
1/26/2018	11:34:01 AM	241200	10.02
1/26/2018	11:39:01 AM	241500	10.02
1/26/2018	11:44:01 AM	241800	10.03
1/26/2018	11:49:01 AM	242100	10.04
1/26/2018	11:54:01 AM	242400	10.03
1/26/2018	11:59:01 AM	242700	10.03

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	12:04:01 PM	243000	10.03
1/26/2018	12:09:01 PM	243300	10.02
1/26/2018	12:14:01 PM	243600	10.03
1/26/2018	12:19:01 PM	243900	10.02
1/26/2018	12:24:01 PM	244200	10.04
1/26/2018	12:29:01 PM	244500	10.03
1/26/2018	12:34:01 PM	244800	10.02
1/26/2018	12:39:01 PM	245100	10.02
1/26/2018	12:44:01 PM	245400	10.03
1/26/2018	12:49:01 PM	245700	10.02
1/26/2018	12:54:01 PM	246000	10.02
1/26/2018	12:59:01 PM	246300	10.03
1/26/2018	1:04:01 PM	246600	10.03
1/26/2018	1:09:01 PM	246900	10.02
1/26/2018	1:14:01 PM	247200	10.02
1/26/2018	1:19:01 PM	247500	10.02
1/26/2018	1:24:01 PM	247800	10.02
1/26/2018	1:29:01 PM	248100	10.02
1/26/2018	1:34:01 PM	248400	10.03
1/26/2018	1:39:01 PM	248700	10.02
1/26/2018	1:44:01 PM	249000	10.02
1/26/2018	1:49:01 PM	249300	10.02
1/26/2018	1:54:01 PM	249600	10.02
1/26/2018	1:59:01 PM	249900	10.02
1/26/2018	2:04:01 PM	250200	10.02
1/26/2018	2:09:01 PM	250500	10.03
1/26/2018	2:14:01 PM	250800	10.03
1/26/2018	2:19:01 PM	251100	10.02
1/26/2018	2:24:01 PM	251400	10.02
1/26/2018	2:29:01 PM	251700	10.03
1/26/2018	2:34:01 PM	252000	10.03
1/26/2018	2:39:01 PM	252300	10.03
1/26/2018	2:44:01 PM	252600	10.03
1/26/2018	2:49:01 PM	252900	10.03
1/26/2018	2:54:01 PM	253200	10.03
1/26/2018	2:59:01 PM	253500	10.03
1/26/2018	3:04:01 PM	253800	10.03
1/26/2018	3:09:01 PM	254100	10.04
1/26/2018	3:14:01 PM	254400	10.04
1/26/2018	3:19:01 PM	254700	10.04
1/26/2018	3:24:01 PM	255000	10.04
1/26/2018	3:29:01 PM	255300	10.04
1/26/2018	3:34:01 PM	255600	10.04
1/26/2018	3:39:01 PM	255900	10.04
1/26/2018	3:44:01 PM	256200	10.04

17PZ03 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	3:49:01 PM	256500	10.04
1/26/2018	3:54:01 PM	256800	10.04
1/26/2018	3:59:01 PM	257100	10.05
1/26/2018	4:04:01 PM	257400	10.04
1/26/2018	4:09:01 PM	257700	10.05
1/26/2018	4:14:01 PM	258000	10.05
1/26/2018	4:19:01 PM	258300	10.05
1/26/2018	4:24:01 PM	258600	10.05
1/26/2018	4:29:01 PM	258900	10.05
1/26/2018	4:34:01 PM	259200	10.05
1/26/2018	4:39:01 PM	259500	10.05
1/26/2018	4:44:01 PM	259800	10.06
1/26/2018	4:49:01 PM	260100	10.06
1/26/2018	4:54:01 PM	260400	10.05
1/26/2018	4:59:01 PM	260700	10.06
1/26/2018	5:03:04 PM	260943	10.06

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/23/2018	4:34:01 PM	0	10.96
1/23/2018	4:39:01 PM	300	10.97
1/23/2018	4:44:01 PM	600	10.96
1/23/2018	4:49:01 PM	900	10.97
1/23/2018	4:54:01 PM	1200	10.98
1/23/2018	4:59:01 PM	1500	10.96
1/23/2018	5:04:01 PM	1800	10.98
1/23/2018	5:09:01 PM	2100	10.97
1/23/2018	5:14:01 PM	2400	10.97
1/23/2018	5:19:01 PM	2700	10.98
1/23/2018	5:24:01 PM	3000	10.97
1/23/2018	5:29:01 PM	3300	10.98
1/23/2018	5:34:01 PM	3600	10.98
1/23/2018	5:39:01 PM	3900	10.98
1/23/2018	5:44:01 PM	4200	10.98
1/23/2018	5:49:01 PM	4500	10.98
1/23/2018	5:54:01 PM	4800	10.98
1/23/2018	5:59:01 PM	5100	10.98
1/23/2018	6:04:01 PM	5400	10.98
1/23/2018	6:09:01 PM	5700	10.99
1/23/2018	6:14:01 PM	6000	10.99
1/23/2018	6:19:01 PM	6300	10.99
1/23/2018	6:24:01 PM	6600	10.99
1/23/2018	6:29:01 PM	6900	10.99
1/23/2018	6:34:01 PM	7200	10.99
1/23/2018	6:39:01 PM	7500	11
1/23/2018	6:44:01 PM	7800	11
1/23/2018	6:49:01 PM	8100	11
1/23/2018	6:54:01 PM	8400	11
1/23/2018	6:59:01 PM	8700	11
1/23/2018	7:04:01 PM	9000	10.99
1/23/2018	7:09:01 PM	9300	11
1/23/2018	7:14:01 PM	9600	11
1/23/2018	7:19:01 PM	9900	11
1/23/2018	7:24:01 PM	10200	11
1/23/2018	7:29:01 PM	10500	11.01
1/23/2018	7:34:01 PM	10800	11.01
1/23/2018	7:39:01 PM	11100	11.01
1/23/2018	7:44:01 PM	11400	11
1/23/2018	7:49:01 PM	11700	11.01
1/23/2018	7:54:01 PM	12000	11.01
1/23/2018	7:59:01 PM	12300	11.01
1/23/2018	8:04:01 PM	12600	11
1/23/2018	8:09:01 PM	12900	11.01

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/23/2018	8:14:01 PM	13200	11.01
1/23/2018	8:19:01 PM	13500	11.01
1/23/2018	8:24:01 PM	13800	11.01
1/23/2018	8:29:01 PM	14100	11.01
1/23/2018	8:34:01 PM	14400	11.01
1/23/2018	8:39:01 PM	14700	11.01
1/23/2018	8:44:01 PM	15000	11.01
1/23/2018	8:49:01 PM	15300	11.01
1/23/2018	8:54:01 PM	15600	11.02
1/23/2018	8:59:01 PM	15900	11.01
1/23/2018	9:04:01 PM	16200	11.01
1/23/2018	9:09:01 PM	16500	11.01
1/23/2018	9:14:01 PM	16800	11.01
1/23/2018	9:19:01 PM	17100	11.01
1/23/2018	9:24:01 PM	17400	11.01
1/23/2018	9:29:01 PM	17700	11.02
1/23/2018	9:34:01 PM	18000	11.01
1/23/2018	9:39:01 PM	18300	11.01
1/23/2018	9:44:01 PM	18600	11.02
1/23/2018	9:49:01 PM	18900	11.01
1/23/2018	9:54:01 PM	19200	11.02
1/23/2018	9:59:01 PM	19500	11.02
1/23/2018	10:04:01 PM	19800	11.02
1/23/2018	10:09:01 PM	20100	11.01
1/23/2018	10:14:01 PM	20400	11.02
1/23/2018	10:19:01 PM	20700	11.01
1/23/2018	10:24:01 PM	21000	11.02
1/23/2018	10:29:01 PM	21300	11.02
1/23/2018	10:34:01 PM	21600	11.01
1/23/2018	10:39:01 PM	21900	11.02
1/23/2018	10:44:01 PM	22200	11.01
1/23/2018	10:49:01 PM	22500	11.01
1/23/2018	10:54:01 PM	22800	11.01
1/23/2018	10:59:01 PM	23100	11.01
1/23/2018	11:04:01 PM	23400	11.01
1/23/2018	11:09:01 PM	23700	11.02
1/23/2018	11:14:01 PM	24000	11.01
1/23/2018	11:19:01 PM	24300	11.01
1/23/2018	11:24:01 PM	24600	11.02
1/23/2018	11:29:01 PM	24900	11.02
1/23/2018	11:34:01 PM	25200	11.02
1/23/2018	11:39:01 PM	25500	11.02
1/23/2018	11:44:01 PM	25800	11.02
1/23/2018	11:49:01 PM	26100	11.01

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/23/2018	11:54:01 PM	26400	11.01
1/23/2018	11:59:01 PM	26700	11.01
1/24/2018	12:04:01 AM	27000	11.01
1/24/2018	12:09:01 AM	27300	11.02
1/24/2018	12:14:01 AM	27600	11.01
1/24/2018	12:19:01 AM	27900	11.02
1/24/2018	12:24:01 AM	28200	11.02
1/24/2018	12:29:01 AM	28500	11.02
1/24/2018	12:34:01 AM	28800	11.02
1/24/2018	12:39:01 AM	29100	11.02
1/24/2018	12:44:01 AM	29400	11.02
1/24/2018	12:49:01 AM	29700	11.02
1/24/2018	12:54:01 AM	30000	11.02
1/24/2018	12:59:01 AM	30300	11.02
1/24/2018	1:04:01 AM	30600	11.02
1/24/2018	1:09:01 AM	30900	11.02
1/24/2018	1:14:01 AM	31200	11.02
1/24/2018	1:19:01 AM	31500	11.02
1/24/2018	1:24:01 AM	31800	11.02
1/24/2018	1:29:01 AM	32100	11.03
1/24/2018	1:34:01 AM	32400	11.02
1/24/2018	1:39:01 AM	32700	11.02
1/24/2018	1:44:01 AM	33000	11.02
1/24/2018	1:49:01 AM	33300	11.02
1/24/2018	1:54:01 AM	33600	11.03
1/24/2018	1:59:01 AM	33900	11.02
1/24/2018	2:04:01 AM	34200	11.03
1/24/2018	2:09:01 AM	34500	11.02
1/24/2018	2:14:01 AM	34800	11.03
1/24/2018	2:19:01 AM	35100	11.02
1/24/2018	2:24:01 AM	35400	11.03
1/24/2018	2:29:01 AM	35700	11.03
1/24/2018	2:34:01 AM	36000	11.03
1/24/2018	2:39:01 AM	36300	11.03
1/24/2018	2:44:01 AM	36600	11.03
1/24/2018	2:49:01 AM	36900	11.03
1/24/2018	2:54:01 AM	37200	11.04
1/24/2018	2:59:01 AM	37500	11.03
1/24/2018	3:04:01 AM	37800	11.04
1/24/2018	3:09:01 AM	38100	11.04
1/24/2018	3:14:01 AM	38400	11.03
1/24/2018	3:19:01 AM	38700	11.04
1/24/2018	3:24:01 AM	39000	11.04
1/24/2018	3:29:01 AM	39300	11.04

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/24/2018	3:34:01 AM	39600	11.04
1/24/2018	3:39:01 AM	39900	11.04
1/24/2018	3:44:01 AM	40200	11.04
1/24/2018	3:49:01 AM	40500	11.04
1/24/2018	3:54:01 AM	40800	11.04
1/24/2018	3:59:01 AM	41100	11.05
1/24/2018	4:04:01 AM	41400	11.04
1/24/2018	4:09:01 AM	41700	11.04
1/24/2018	4:14:01 AM	42000	11.04
1/24/2018	4:19:01 AM	42300	11.05
1/24/2018	4:24:01 AM	42600	11.04
1/24/2018	4:29:01 AM	42900	11.04
1/24/2018	4:34:01 AM	43200	11.05
1/24/2018	4:39:01 AM	43500	11.04
1/24/2018	4:44:01 AM	43800	11.04
1/24/2018	4:49:01 AM	44100	11.05
1/24/2018	4:54:01 AM	44400	11.04
1/24/2018	4:59:01 AM	44700	11.05
1/24/2018	5:04:01 AM	45000	11.04
1/24/2018	5:09:01 AM	45300	11.05
1/24/2018	5:14:01 AM	45600	11.04
1/24/2018	5:19:01 AM	45900	11.04
1/24/2018	5:24:01 AM	46200	11.04
1/24/2018	5:29:01 AM	46500	11.05
1/24/2018	5:34:01 AM	46800	11.05
1/24/2018	5:39:01 AM	47100	11.05
1/24/2018	5:44:01 AM	47400	11.05
1/24/2018	5:49:01 AM	47700	11.05
1/24/2018	5:54:01 AM	48000	11.05
1/24/2018	5:59:01 AM	48300	11.04
1/24/2018	6:04:01 AM	48600	11.05
1/24/2018	6:09:01 AM	48900	11.05
1/24/2018	6:14:01 AM	49200	11.05
1/24/2018	6:19:01 AM	49500	11.05
1/24/2018	6:24:01 AM	49800	11.05
1/24/2018	6:29:01 AM	50100	11.05
1/24/2018	6:34:01 AM	50400	11.05
1/24/2018	6:39:01 AM	50700	11.05
1/24/2018	6:44:01 AM	51000	11.05
1/24/2018	6:49:01 AM	51300	11.06
1/24/2018	6:54:01 AM	51600	11.06
1/24/2018	6:59:01 AM	51900	11.06
1/24/2018	7:04:01 AM	52200	11.05
1/24/2018	7:09:01 AM	52500	11.06

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/24/2018	7:14:01 AM	52800	11.06
1/24/2018	7:19:01 AM	53100	11.06
1/24/2018	7:24:01 AM	53400	11.06
1/24/2018	7:29:01 AM	53700	11.06
1/24/2018	7:34:01 AM	54000	11.06
1/24/2018	7:39:01 AM	54300	11.07
1/24/2018	7:44:01 AM	54600	11.06
1/24/2018	7:49:01 AM	54900	11.06
1/24/2018	7:54:01 AM	55200	11.06
1/24/2018	7:59:01 AM	55500	11.06
1/24/2018	8:04:01 AM	55800	11.06
1/24/2018	8:09:01 AM	56100	11.07
1/24/2018	8:14:01 AM	56400	11.07
1/24/2018	8:19:01 AM	56700	11.06
1/24/2018	8:24:01 AM	57000	11.06
1/24/2018	8:29:01 AM	57300	11.06
1/24/2018	8:34:01 AM	57600	11.07
1/24/2018	8:39:01 AM	57900	11.07
1/24/2018	8:44:01 AM	58200	11.07
1/24/2018	8:49:01 AM	58500	11.07
1/24/2018	8:54:01 AM	58800	11.07
1/24/2018	8:59:01 AM	59100	11.07
1/24/2018	9:04:01 AM	59400	11.07
1/24/2018	9:09:01 AM	59700	11.07
1/24/2018	9:14:01 AM	60000	11.07
1/24/2018	9:19:01 AM	60300	11.07
1/24/2018	9:24:01 AM	60600	11.07
1/24/2018	9:29:01 AM	60900	11.07
1/24/2018	9:34:01 AM	61200	11.07
1/24/2018	9:39:01 AM	61500	11.08
1/24/2018	9:44:01 AM	61800	11.08
1/24/2018	9:49:01 AM	62100	11.07
1/24/2018	9:54:01 AM	62400	11.07
1/24/2018	9:59:01 AM	62700	11.08
1/24/2018	10:04:01 AM	63000	11.07
1/24/2018	10:09:01 AM	63300	11.08
1/24/2018	10:14:01 AM	63600	11.07
1/24/2018	10:19:01 AM	63900	11.08
1/24/2018	10:24:01 AM	64200	11.07
1/24/2018	10:29:01 AM	64500	11.07
1/24/2018	10:34:01 AM	64800	11.07
1/24/2018	10:39:01 AM	65100	11.08
1/24/2018	10:44:01 AM	65400	11.07
1/24/2018	10:49:01 AM	65700	11.07

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/24/2018	10:54:01 AM	66000	11.07
1/24/2018	10:59:01 AM	66300	11.08
1/24/2018	11:04:01 AM	66600	11.07
1/24/2018	11:09:01 AM	66900	11.07
1/24/2018	11:14:01 AM	67200	11.06
1/24/2018	11:19:01 AM	67500	11.06
1/24/2018	11:24:01 AM	67800	11.07
1/24/2018	11:29:01 AM	68100	11.06
1/24/2018	11:34:01 AM	68400	11.06
1/24/2018	11:39:01 AM	68700	11.06
1/24/2018	11:44:01 AM	69000	11.06
1/24/2018	11:49:01 AM	69300	11.06
1/24/2018	11:54:01 AM	69600	11.06
1/24/2018	11:59:01 AM	69900	11.06
1/24/2018	12:04:01 PM	70200	11.05
1/24/2018	12:09:01 PM	70500	11.05
1/24/2018	12:14:01 PM	70800	11.04
1/24/2018	12:19:01 PM	71100	11.08
1/24/2018	12:24:01 PM	71400	11.07
1/24/2018	12:29:01 PM	71700	11.07
1/24/2018	12:34:01 PM	72000	11.06
1/24/2018	12:39:01 PM	72300	11.06
1/24/2018	12:44:01 PM	72600	11.05
1/24/2018	12:49:01 PM	72900	11.06
1/24/2018	12:54:01 PM	73200	11.06
1/24/2018	12:59:01 PM	73500	11.05
1/24/2018	1:04:01 PM	73800	11.05
1/24/2018	1:09:01 PM	74100	11.05
1/24/2018	1:14:01 PM	74400	11.05
1/24/2018	1:19:01 PM	74700	11.05
1/24/2018	1:24:01 PM	75000	11.05
1/24/2018	1:29:01 PM	75300	11.04
1/24/2018	1:34:01 PM	75600	11.05
1/24/2018	1:39:01 PM	75900	11.04
1/24/2018	1:44:01 PM	76200	11.05
1/24/2018	1:49:01 PM	76500	11.05
1/24/2018	1:54:01 PM	76800	11.05
1/24/2018	1:59:01 PM	77100	11.04
1/24/2018	2:04:01 PM	77400	11.04
1/24/2018	2:09:01 PM	77700	11.04
1/24/2018	2:14:01 PM	78000	11.03
1/24/2018	2:19:01 PM	78300	11.03
1/24/2018	2:24:01 PM	78600	11.04
1/24/2018	2:29:01 PM	78900	11.04

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/24/2018	2:34:01 PM	79200	11.04
1/24/2018	2:39:01 PM	79500	11.04
1/24/2018	2:44:01 PM	79800	11.04
1/24/2018	2:49:01 PM	80100	11.04
1/24/2018	2:54:01 PM	80400	11.04
1/24/2018	2:59:01 PM	80700	11.04
1/24/2018	3:04:01 PM	81000	11.04
1/24/2018	3:09:01 PM	81300	11.04
1/24/2018	3:14:01 PM	81600	11.04
1/24/2018	3:19:01 PM	81900	11.03
1/24/2018	3:24:01 PM	82200	11.04
1/24/2018	3:29:01 PM	82500	11.04
1/24/2018	3:34:01 PM	82800	11.04
1/24/2018	3:39:01 PM	83100	11.04
1/24/2018	3:44:01 PM	83400	11.04
1/24/2018	3:49:01 PM	83700	11.04
1/24/2018	3:54:01 PM	84000	11.04
1/24/2018	3:59:01 PM	84300	11.04
1/24/2018	4:04:01 PM	84600	11.04
1/24/2018	4:09:01 PM	84900	11.04
1/24/2018	4:14:01 PM	85200	11.04
1/24/2018	4:19:01 PM	85500	11.04
1/24/2018	4:24:01 PM	85800	11.04
1/24/2018	4:29:01 PM	86100	11.04
1/24/2018	4:34:01 PM	86400	11.04
1/24/2018	4:39:01 PM	86700	11.04
1/24/2018	4:44:01 PM	87000	11.04
1/24/2018	4:49:01 PM	87300	11.04
1/24/2018	4:54:01 PM	87600	11.04
1/24/2018	4:59:01 PM	87900	11.04
1/24/2018	5:04:01 PM	88200	11.05
1/24/2018	5:09:01 PM	88500	11.05
1/24/2018	5:14:01 PM	88800	11.05
1/24/2018	5:19:01 PM	89100	11.05
1/24/2018	5:24:01 PM	89400	11.05
1/24/2018	5:29:01 PM	89700	11.05
1/24/2018	5:34:01 PM	90000	11.05
1/24/2018	5:39:01 PM	90300	11.05
1/24/2018	5:44:01 PM	90600	11.05
1/24/2018	5:49:01 PM	90900	11.05
1/24/2018	5:54:01 PM	91200	11.05
1/24/2018	5:59:01 PM	91500	11.05
1/24/2018	6:04:01 PM	91800	11.05
1/24/2018	6:09:01 PM	92100	11.05

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/24/2018	6:14:01 PM	92400	11.05
1/24/2018	6:19:01 PM	92700	11.05
1/24/2018	6:24:01 PM	93000	11.06
1/24/2018	6:29:01 PM	93300	11.05
1/24/2018	6:34:01 PM	93600	11.06
1/24/2018	6:39:01 PM	93900	11.06
1/24/2018	6:44:01 PM	94200	11.06
1/24/2018	6:49:01 PM	94500	11.06
1/24/2018	6:54:01 PM	94800	11.05
1/24/2018	6:59:01 PM	95100	11.05
1/24/2018	7:04:01 PM	95400	11.05
1/24/2018	7:09:01 PM	95700	11.06
1/24/2018	7:14:01 PM	96000	11.06
1/24/2018	7:19:01 PM	96300	11.06
1/24/2018	7:24:01 PM	96600	11.06
1/24/2018	7:29:01 PM	96900	11.06
1/24/2018	7:34:01 PM	97200	11.06
1/24/2018	7:39:01 PM	97500	11.07
1/24/2018	7:44:01 PM	97800	11.06
1/24/2018	7:49:01 PM	98100	11.06
1/24/2018	7:54:01 PM	98400	11.07
1/24/2018	7:59:01 PM	98700	11.06
1/24/2018	8:04:01 PM	99000	11.06
1/24/2018	8:09:01 PM	99300	11.07
1/24/2018	8:14:01 PM	99600	11.06
1/24/2018	8:19:01 PM	99900	11.06
1/24/2018	8:24:01 PM	100200	11.07
1/24/2018	8:29:01 PM	100500	11.06
1/24/2018	8:34:01 PM	100800	11.06
1/24/2018	8:39:01 PM	101100	11.06
1/24/2018	8:44:01 PM	101400	11.06
1/24/2018	8:49:01 PM	101700	11.06
1/24/2018	8:54:01 PM	102000	11.06
1/24/2018	8:59:01 PM	102300	11.06
1/24/2018	9:04:01 PM	102600	11.06
1/24/2018	9:09:01 PM	102900	11.07
1/24/2018	9:14:01 PM	103200	11.06
1/24/2018	9:19:01 PM	103500	11.07
1/24/2018	9:24:01 PM	103800	11.06
1/24/2018	9:29:01 PM	104100	11.06
1/24/2018	9:34:01 PM	104400	11.07
1/24/2018	9:39:01 PM	104700	11.06
1/24/2018	9:44:01 PM	105000	11.06
1/24/2018	9:49:01 PM	105300	11.06

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/24/2018	9:54:01 PM	105600	11.06
1/24/2018	9:59:01 PM	105900	11.06
1/24/2018	10:04:01 PM	106200	11.06
1/24/2018	10:09:01 PM	106500	11.07
1/24/2018	10:14:01 PM	106800	11.07
1/24/2018	10:19:01 PM	107100	11.07
1/24/2018	10:24:01 PM	107400	11.07
1/24/2018	10:29:01 PM	107700	11.07
1/24/2018	10:34:01 PM	108000	11.07
1/24/2018	10:39:01 PM	108300	11.08
1/24/2018	10:44:01 PM	108600	11.06
1/24/2018	10:49:01 PM	108900	11.07
1/24/2018	10:54:01 PM	109200	11.07
1/24/2018	10:59:01 PM	109500	11.07
1/24/2018	11:04:01 PM	109800	11.07
1/24/2018	11:09:01 PM	110100	11.07
1/24/2018	11:14:01 PM	110400	11.07
1/24/2018	11:19:01 PM	110700	11.07
1/24/2018	11:24:01 PM	111000	11.07
1/24/2018	11:29:01 PM	111300	11.06
1/24/2018	11:34:01 PM	111600	11.07
1/24/2018	11:39:01 PM	111900	11.07
1/24/2018	11:44:01 PM	112200	11.07
1/24/2018	11:49:01 PM	112500	11.07
1/24/2018	11:54:01 PM	112800	11.07
1/24/2018	11:59:01 PM	113100	11.07
1/25/2018	12:04:01 AM	113400	11.07
1/25/2018	12:09:01 AM	113700	11.07
1/25/2018	12:14:01 AM	114000	11.07
1/25/2018	12:19:01 AM	114300	11.07
1/25/2018	12:24:01 AM	114600	11.07
1/25/2018	12:29:01 AM	114900	11.07
1/25/2018	12:34:01 AM	115200	11.07
1/25/2018	12:39:01 AM	115500	11.07
1/25/2018	12:44:01 AM	115800	11.07
1/25/2018	12:49:01 AM	116100	11.06
1/25/2018	12:54:01 AM	116400	11.06
1/25/2018	12:59:01 AM	116700	11.06
1/25/2018	1:04:01 AM	117000	11.07
1/25/2018	1:09:01 AM	117300	11.06
1/25/2018	1:14:01 AM	117600	11.07
1/25/2018	1:19:01 AM	117900	11.07
1/25/2018	1:24:01 AM	118200	11.07
1/25/2018	1:29:01 AM	118500	11.07

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/25/2018	1:34:01 AM	118800	11.07
1/25/2018	1:39:01 AM	119100	11.06
1/25/2018	1:44:01 AM	119400	11.07
1/25/2018	1:49:01 AM	119700	11.06
1/25/2018	1:54:01 AM	120000	11.06
1/25/2018	1:59:01 AM	120300	11.06
1/25/2018	2:04:01 AM	120600	11.06
1/25/2018	2:09:01 AM	120900	11.06
1/25/2018	2:14:01 AM	121200	11.06
1/25/2018	2:19:01 AM	121500	11.06
1/25/2018	2:24:01 AM	121800	11.06
1/25/2018	2:29:01 AM	122100	11.06
1/25/2018	2:34:01 AM	122400	11.06
1/25/2018	2:39:01 AM	122700	11.06
1/25/2018	2:44:01 AM	123000	11.07
1/25/2018	2:49:01 AM	123300	11.06
1/25/2018	2:54:01 AM	123600	11.06
1/25/2018	2:59:01 AM	123900	11.06
1/25/2018	3:04:01 AM	124200	11.06
1/25/2018	3:09:01 AM	124500	11.06
1/25/2018	3:14:01 AM	124800	11.06
1/25/2018	3:19:01 AM	125100	11.06
1/25/2018	3:24:01 AM	125400	11.06
1/25/2018	3:29:01 AM	125700	11.06
1/25/2018	3:34:01 AM	126000	11.07
1/25/2018	3:39:01 AM	126300	11.06
1/25/2018	3:44:01 AM	126600	11.06
1/25/2018	3:49:01 AM	126900	11.07
1/25/2018	3:54:01 AM	127200	11.06
1/25/2018	3:59:01 AM	127500	11.06
1/25/2018	4:04:01 AM	127800	11.06
1/25/2018	4:09:01 AM	128100	11.06
1/25/2018	4:14:01 AM	128400	11.06
1/25/2018	4:19:01 AM	128700	11.06
1/25/2018	4:24:01 AM	129000	11.06
1/25/2018	4:29:01 AM	129300	11.06
1/25/2018	4:34:01 AM	129600	11.06
1/25/2018	4:39:01 AM	129900	11.06
1/25/2018	4:44:01 AM	130200	11.06
1/25/2018	4:49:01 AM	130500	11.06
1/25/2018	4:54:01 AM	130800	11.06
1/25/2018	4:59:01 AM	131100	11.06
1/25/2018	5:04:01 AM	131400	11.06
1/25/2018	5:09:01 AM	131700	11.06

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/25/2018	5:14:01 AM	132000	11.07
1/25/2018	5:19:01 AM	132300	11.07
1/25/2018	5:24:01 AM	132600	11.06
1/25/2018	5:29:01 AM	132900	11.06
1/25/2018	5:34:01 AM	133200	11.07
1/25/2018	5:39:01 AM	133500	11.07
1/25/2018	5:44:01 AM	133800	11.07
1/25/2018	5:49:01 AM	134100	11.07
1/25/2018	5:54:01 AM	134400	11.07
1/25/2018	5:59:01 AM	134700	11.07
1/25/2018	6:04:01 AM	135000	11.07
1/25/2018	6:09:01 AM	135300	11.07
1/25/2018	6:14:01 AM	135600	11.07
1/25/2018	6:19:01 AM	135900	11.07
1/25/2018	6:24:01 AM	136200	11.07
1/25/2018	6:29:01 AM	136500	11.08
1/25/2018	6:34:01 AM	136800	11.07
1/25/2018	6:39:01 AM	137100	11.07
1/25/2018	6:44:01 AM	137400	11.08
1/25/2018	6:49:01 AM	137700	11.08
1/25/2018	6:54:01 AM	138000	11.08
1/25/2018	6:59:01 AM	138300	11.07
1/25/2018	7:04:01 AM	138600	11.08
1/25/2018	7:09:01 AM	138900	11.08
1/25/2018	7:14:01 AM	139200	11.08
1/25/2018	7:19:01 AM	139500	11.08
1/25/2018	7:24:01 AM	139800	11.08
1/25/2018	7:29:01 AM	140100	11.08
1/25/2018	7:34:01 AM	140400	11.08
1/25/2018	7:39:01 AM	140700	11.08
1/25/2018	7:44:01 AM	141000	11.07
1/25/2018	7:49:01 AM	141300	11.08
1/25/2018	7:54:01 AM	141600	11.08
1/25/2018	7:59:01 AM	141900	11.08
1/25/2018	8:04:01 AM	142200	11.08
1/25/2018	8:09:01 AM	142500	11.08
1/25/2018	8:14:01 AM	142800	11.09
1/25/2018	8:19:01 AM	143100	11.08
1/25/2018	8:24:01 AM	143400	11.08
1/25/2018	8:29:01 AM	143700	11.08
1/25/2018	8:34:01 AM	144000	11.08
1/25/2018	8:39:01 AM	144300	11.08
1/25/2018	8:44:01 AM	144600	11.09
1/25/2018	8:49:01 AM	144900	11.09

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/25/2018	8:54:01 AM	145200	11.08
1/25/2018	8:59:01 AM	145500	11.09
1/25/2018	9:04:01 AM	145800	11.09
1/25/2018	9:09:01 AM	146100	11.09
1/25/2018	9:14:01 AM	146400	11.08
1/25/2018	9:19:01 AM	146700	11.09
1/25/2018	9:24:01 AM	147000	11.09
1/25/2018	9:29:01 AM	147300	11.09
1/25/2018	9:34:01 AM	147600	11.09
1/25/2018	9:39:01 AM	147900	11.09
1/25/2018	9:44:01 AM	148200	11.09
1/25/2018	9:49:01 AM	148500	11.09
1/25/2018	9:54:01 AM	148800	11.09
1/25/2018	9:59:01 AM	149100	11.09
1/25/2018	10:04:01 AM	149400	11.09
1/25/2018	10:09:01 AM	149700	11.09
1/25/2018	10:14:01 AM	150000	11.09
1/25/2018	10:19:01 AM	150300	11.09
1/25/2018	10:24:01 AM	150600	11.09
1/25/2018	10:29:01 AM	150900	11.09
1/25/2018	10:34:01 AM	151200	11.08
1/25/2018	10:39:01 AM	151500	11.09
1/25/2018	10:44:01 AM	151800	11.08
1/25/2018	10:49:01 AM	152100	11.08
1/25/2018	10:54:01 AM	152400	11.09
1/25/2018	10:59:01 AM	152700	11.09
1/25/2018	11:04:01 AM	153000	11.08
1/25/2018	11:09:01 AM	153300	11.08
1/25/2018	11:14:01 AM	153600	11.08
1/25/2018	11:19:01 AM	153900	11.08
1/25/2018	11:24:01 AM	154200	11.08
1/25/2018	11:29:01 AM	154500	11.08
1/25/2018	11:34:01 AM	154800	11.08
1/25/2018	11:39:01 AM	155100	11.08
1/25/2018	11:44:01 AM	155400	11.06
1/25/2018	11:49:01 AM	155700	11.07
1/25/2018	11:54:01 AM	156000	11.07
1/25/2018	11:59:01 AM	156300	11.07
1/25/2018	12:04:01 PM	156600	11.06
1/25/2018	12:09:01 PM	156900	11.05
1/25/2018	12:14:01 PM	157200	11.07
1/25/2018	12:19:01 PM	157500	11.06
1/25/2018	12:24:01 PM	157800	11.07
1/25/2018	12:29:01 PM	158100	11.06

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	17WW01
1/25/2018	12:34:01 PM	158400	11.06
1/25/2018	12:39:01 PM	158700	11.07
1/25/2018	12:44:01 PM	159000	11.06
1/25/2018	12:49:01 PM	159300	11.06
1/25/2018	12:54:01 PM	159600	11.06
1/25/2018	12:59:01 PM	159900	11.06
1/25/2018	1:04:01 PM	160200	11.04
1/25/2018	1:09:01 PM	160500	11.04
1/25/2018	1:14:01 PM	160800	11.05
1/25/2018	1:19:01 PM	161100	11.05
1/25/2018	1:24:01 PM	161400	11.05
1/25/2018	1:29:01 PM	161700	11.04
1/25/2018	1:34:01 PM	162000	11.05
1/25/2018	1:39:01 PM	162300	11.04
1/25/2018	1:44:01 PM	162600	11.04
1/25/2018	1:49:01 PM	162900	11.03
1/25/2018	1:54:01 PM	163200	11.04
1/25/2018	1:59:01 PM	163500	11.04
1/25/2018	2:04:01 PM	163800	11.03
1/25/2018	2:09:01 PM	164100	11.03
1/25/2018	2:14:01 PM	164400	11.04
1/25/2018	2:19:01 PM	164700	11.03
1/25/2018	2:24:01 PM	165000	11.02
1/25/2018	2:29:01 PM	165300	11.03
1/25/2018	2:34:01 PM	165600	11.03
1/25/2018	2:39:01 PM	165900	11.03
1/25/2018	2:44:01 PM	166200	11.03
1/25/2018	2:49:01 PM	166500	11.04
1/25/2018	2:54:01 PM	166800	11.03
1/25/2018	2:59:01 PM	167100	11.03
1/25/2018	3:04:01 PM	167400	11.03
1/25/2018	3:09:01 PM	167700	11.04
1/25/2018	3:14:01 PM	168000	11.03
1/25/2018	3:19:01 PM	168300	11.04
1/25/2018	3:24:01 PM	168600	11.02
1/25/2018	3:29:01 PM	168900	11.03
1/25/2018	3:34:01 PM	169200	11.02
1/25/2018	3:39:01 PM	169500	11.02
1/25/2018	3:44:01 PM	169800	11.03
1/25/2018	3:49:01 PM	170100	11.03
1/25/2018	3:54:01 PM	170400	11.02
1/25/2018	3:59:01 PM	170700	11.02
1/25/2018	4:04:01 PM	171000	11.03
1/25/2018	4:09:01 PM	171300	11.02

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/25/2018	4:14:01 PM	171600	11.02
1/25/2018	4:19:01 PM	171900	12.09
1/25/2018	4:24:01 PM	172200	12.48
1/25/2018	4:29:01 PM	172500	12.54
1/25/2018	4:34:01 PM	172800	12.57
1/25/2018	4:39:01 PM	173100	12.6
1/25/2018	4:44:01 PM	173400	12.61
1/25/2018	4:49:01 PM	173700	12.61
1/25/2018	4:54:01 PM	174000	12.61
1/25/2018	4:59:01 PM	174300	12.61
1/25/2018	5:04:01 PM	174600	12.61
1/25/2018	5:09:01 PM	174900	12.62
1/25/2018	5:14:01 PM	175200	12.61
1/25/2018	5:19:01 PM	175500	12.61
1/25/2018	5:24:01 PM	175800	12.6
1/25/2018	5:29:01 PM	176100	12.6
1/25/2018	5:34:01 PM	176400	12.6
1/25/2018	5:39:01 PM	176700	12.61
1/25/2018	5:44:01 PM	177000	12.61
1/25/2018	5:49:01 PM	177300	12.61
1/25/2018	5:54:01 PM	177600	12.62
1/25/2018	5:59:01 PM	177900	12.62
1/25/2018	6:04:01 PM	178200	12.61
1/25/2018	6:09:01 PM	178500	12.61
1/25/2018	6:14:01 PM	178800	12.61
1/25/2018	6:19:01 PM	179100	12.62
1/25/2018	6:24:01 PM	179400	12.62
1/25/2018	6:29:01 PM	179700	12.63
1/25/2018	6:34:01 PM	180000	12.64
1/25/2018	6:39:01 PM	180300	12.64
1/25/2018	6:44:01 PM	180600	12.63
1/25/2018	6:49:01 PM	180900	12.63
1/25/2018	6:54:01 PM	181200	12.63
1/25/2018	6:59:01 PM	181500	12.63
1/25/2018	7:04:01 PM	181800	12.63
1/25/2018	7:09:01 PM	182100	12.63
1/25/2018	7:14:01 PM	182400	12.63
1/25/2018	7:19:01 PM	182700	12.64
1/25/2018	7:24:01 PM	183000	12.64
1/25/2018	7:29:01 PM	183300	12.63
1/25/2018	7:34:01 PM	183600	12.64
1/25/2018	7:39:01 PM	183900	12.65
1/25/2018	7:44:01 PM	184200	12.65
1/25/2018	7:49:01 PM	184500	12.64

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/25/2018	7:54:01 PM	184800	12.64
1/25/2018	7:59:01 PM	185100	12.65
1/25/2018	8:04:01 PM	185400	12.65
1/25/2018	8:09:01 PM	185700	12.64
1/25/2018	8:14:01 PM	186000	12.64
1/25/2018	8:19:01 PM	186300	12.64
1/25/2018	8:24:01 PM	186600	12.65
1/25/2018	8:29:01 PM	186900	12.65
1/25/2018	8:34:01 PM	187200	12.65
1/25/2018	8:39:01 PM	187500	12.65
1/25/2018	8:44:01 PM	187800	12.65
1/25/2018	8:49:01 PM	188100	12.65
1/25/2018	8:54:01 PM	188400	12.65
1/25/2018	8:59:01 PM	188700	12.65
1/25/2018	9:04:01 PM	189000	12.65
1/25/2018	9:09:01 PM	189300	12.66
1/25/2018	9:14:01 PM	189600	12.66
1/25/2018	9:19:01 PM	189900	12.65
1/25/2018	9:24:01 PM	190200	12.66
1/25/2018	9:29:01 PM	190500	12.66
1/25/2018	9:34:01 PM	190800	12.66
1/25/2018	9:39:01 PM	191100	12.65
1/25/2018	9:44:01 PM	191400	12.65
1/25/2018	9:49:01 PM	191700	12.65
1/25/2018	9:54:01 PM	192000	12.65
1/25/2018	9:59:01 PM	192300	12.65
1/25/2018	10:04:01 PM	192600	12.65
1/25/2018	10:09:01 PM	192900	12.64
1/25/2018	10:14:01 PM	193200	12.65
1/25/2018	10:19:01 PM	193500	12.65
1/25/2018	10:24:01 PM	193800	12.65
1/25/2018	10:29:01 PM	194100	12.65
1/25/2018	10:34:01 PM	194400	12.65
1/25/2018	10:39:01 PM	194700	12.65
1/25/2018	10:44:01 PM	195000	12.65
1/25/2018	10:49:01 PM	195300	12.65
1/25/2018	10:54:01 PM	195600	12.65
1/25/2018	10:59:01 PM	195900	12.65
1/25/2018	11:04:01 PM	196200	12.65
1/25/2018	11:09:01 PM	196500	12.65
1/25/2018	11:14:01 PM	196800	12.65
1/25/2018	11:19:01 PM	197100	12.7
1/25/2018	11:24:01 PM	197400	12.75
1/25/2018	11:29:01 PM	197700	12.77

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/25/2018	11:34:01 PM	198000	12.77
1/25/2018	11:39:01 PM	198300	12.78
1/25/2018	11:44:01 PM	198600	12.78
1/25/2018	11:49:01 PM	198900	12.77
1/25/2018	11:54:01 PM	199200	12.78
1/25/2018	11:59:01 PM	199500	12.78
1/26/2018	12:04:01 AM	199800	12.79
1/26/2018	12:09:01 AM	200100	12.78
1/26/2018	12:14:01 AM	200400	12.78
1/26/2018	12:19:01 AM	200700	12.78
1/26/2018	12:24:01 AM	201000	12.77
1/26/2018	12:29:01 AM	201300	12.78
1/26/2018	12:34:01 AM	201600	12.78
1/26/2018	12:39:01 AM	201900	12.78
1/26/2018	12:44:01 AM	202200	12.78
1/26/2018	12:49:01 AM	202500	12.78
1/26/2018	12:54:01 AM	202800	12.78
1/26/2018	12:59:01 AM	203100	12.78
1/26/2018	1:04:01 AM	203400	12.78
1/26/2018	1:09:01 AM	203700	12.77
1/26/2018	1:14:01 AM	204000	12.77
1/26/2018	1:19:01 AM	204300	12.77
1/26/2018	1:24:01 AM	204600	12.77
1/26/2018	1:29:01 AM	204900	12.77
1/26/2018	1:34:01 AM	205200	12.76
1/26/2018	1:39:01 AM	205500	12.76
1/26/2018	1:44:01 AM	205800	12.77
1/26/2018	1:49:01 AM	206100	12.76
1/26/2018	1:54:01 AM	206400	12.76
1/26/2018	1:59:01 AM	206700	12.77
1/26/2018	2:04:01 AM	207000	12.76
1/26/2018	2:09:01 AM	207300	12.76
1/26/2018	2:14:01 AM	207600	12.77
1/26/2018	2:19:01 AM	207900	12.76
1/26/2018	2:24:01 AM	208200	12.76
1/26/2018	2:29:01 AM	208500	12.76
1/26/2018	2:34:01 AM	208800	12.77
1/26/2018	2:39:01 AM	209100	12.77
1/26/2018	2:44:01 AM	209400	12.77
1/26/2018	2:49:01 AM	209700	12.76
1/26/2018	2:54:01 AM	210000	12.76
1/26/2018	2:59:01 AM	210300	12.77
1/26/2018	3:04:01 AM	210600	12.75
1/26/2018	3:09:01 AM	210900	12.76

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/26/2018	3:14:01 AM	211200	12.76
1/26/2018	3:19:01 AM	211500	12.76
1/26/2018	3:24:01 AM	211800	12.77
1/26/2018	3:29:01 AM	212100	12.77
1/26/2018	3:34:01 AM	212400	12.77
1/26/2018	3:39:01 AM	212700	12.76
1/26/2018	3:44:01 AM	213000	12.77
1/26/2018	3:49:01 AM	213300	12.77
1/26/2018	3:54:01 AM	213600	12.76
1/26/2018	3:59:01 AM	213900	12.76
1/26/2018	4:04:01 AM	214200	12.76
1/26/2018	4:09:01 AM	214500	12.76
1/26/2018	4:14:01 AM	214800	12.76
1/26/2018	4:19:01 AM	215100	12.76
1/26/2018	4:24:01 AM	215400	12.76
1/26/2018	4:29:01 AM	215700	12.77
1/26/2018	4:34:01 AM	216000	12.77
1/26/2018	4:39:01 AM	216300	12.76
1/26/2018	4:44:01 AM	216600	12.76
1/26/2018	4:49:01 AM	216900	12.76
1/26/2018	4:54:01 AM	217200	12.76
1/26/2018	4:59:01 AM	217500	12.76
1/26/2018	5:04:01 AM	217800	12.75
1/26/2018	5:09:01 AM	218100	12.76
1/26/2018	5:14:01 AM	218400	12.75
1/26/2018	5:19:01 AM	218700	12.76
1/26/2018	5:24:01 AM	219000	12.76
1/26/2018	5:29:01 AM	219300	12.74
1/26/2018	5:34:01 AM	219600	12.75
1/26/2018	5:39:01 AM	219900	12.76
1/26/2018	5:44:01 AM	220200	12.76
1/26/2018	5:49:01 AM	220500	12.76
1/26/2018	5:54:01 AM	220800	12.76
1/26/2018	5:59:01 AM	221100	12.76
1/26/2018	6:04:01 AM	221400	12.76
1/26/2018	6:09:01 AM	221700	12.76
1/26/2018	6:14:01 AM	222000	12.76
1/26/2018	6:19:01 AM	222300	12.76
1/26/2018	6:24:01 AM	222600	12.77
1/26/2018	6:29:01 AM	222900	12.76
1/26/2018	6:34:01 AM	223200	12.77
1/26/2018	6:39:01 AM	223500	12.77
1/26/2018	6:44:01 AM	223800	12.76
1/26/2018	6:49:01 AM	224100	12.76

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/26/2018	6:54:01 AM	224400	12.76
1/26/2018	6:59:01 AM	224700	12.77
1/26/2018	7:04:01 AM	225000	12.77
1/26/2018	7:09:01 AM	225300	12.76
1/26/2018	7:14:01 AM	225600	12.76
1/26/2018	7:19:01 AM	225900	12.76
1/26/2018	7:24:01 AM	226200	12.77
1/26/2018	7:29:01 AM	226500	12.76
1/26/2018	7:34:01 AM	226800	12.76
1/26/2018	7:39:01 AM	227100	12.77
1/26/2018	7:44:01 AM	227400	12.77
1/26/2018	7:49:01 AM	227700	12.77
1/26/2018	7:54:01 AM	228000	12.78
1/26/2018	7:59:01 AM	228300	12.77
1/26/2018	8:04:01 AM	228600	12.78
1/26/2018	8:09:01 AM	228900	12.77
1/26/2018	8:14:01 AM	229200	12.78
1/26/2018	8:19:01 AM	229500	12.78
1/26/2018	8:24:01 AM	229800	12.79
1/26/2018	8:29:01 AM	230100	12.8
1/26/2018	8:34:01 AM	230400	12.8
1/26/2018	8:39:01 AM	230700	12.8
1/26/2018	8:44:01 AM	231000	12.8
1/26/2018	8:49:01 AM	231300	12.8
1/26/2018	8:54:01 AM	231600	12.8
1/26/2018	8:59:01 AM	231900	12.81
1/26/2018	9:04:01 AM	232200	12.8
1/26/2018	9:09:01 AM	232500	15.12
1/26/2018	9:14:01 AM	232800	16.06
1/26/2018	9:19:01 AM	233100	16.76
1/26/2018	9:24:01 AM	233400	17.26
1/26/2018	9:29:01 AM	233700	17.6
1/26/2018	9:34:01 AM	234000	17.86
1/26/2018	9:39:01 AM	234300	18.07
1/26/2018	9:44:01 AM	234600	18.45
1/26/2018	9:49:01 AM	234900	18.72
1/26/2018	9:54:01 AM	235200	18.93
1/26/2018	9:59:01 AM	235500	19.08
1/26/2018	10:04:01 AM	235800	19.2
1/26/2018	10:09:01 AM	236100	19.3
1/26/2018	10:14:01 AM	236400	19.36
1/26/2018	10:19:01 AM	236700	19.42
1/26/2018	10:24:01 AM	237000	19.46
1/26/2018	10:29:01 AM	237300	19.51

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/26/2018	10:34:01 AM	237600	19.54
1/26/2018	10:39:01 AM	237900	19.59
1/26/2018	10:44:01 AM	238200	19.61
1/26/2018	10:49:01 AM	238500	19.64
1/26/2018	10:54:01 AM	238800	19.67
1/26/2018	10:59:01 AM	239100	19.69
1/26/2018	11:04:01 AM	239400	19.71
1/26/2018	11:09:01 AM	239700	19.73
1/26/2018	11:14:01 AM	240000	19.74
1/26/2018	11:19:01 AM	240300	19.76
1/26/2018	11:24:01 AM	240600	19.76
1/26/2018	11:29:01 AM	240900	19.79
1/26/2018	11:34:01 AM	241200	19.79
1/26/2018	11:39:01 AM	241500	19.79
1/26/2018	11:44:01 AM	241800	19.8
1/26/2018	11:49:01 AM	242100	19.82
1/26/2018	11:54:01 AM	242400	19.83
1/26/2018	11:59:01 AM	242700	19.83
1/26/2018	12:04:01 PM	243000	19.85
1/26/2018	12:09:01 PM	243300	19.85
1/26/2018	12:14:01 PM	243600	19.87
1/26/2018	12:19:01 PM	243900	19.87
1/26/2018	12:24:01 PM	244200	19.9
1/26/2018	12:29:01 PM	244500	19.9
1/26/2018	12:34:01 PM	244800	19.91
1/26/2018	12:39:01 PM	245100	19.92
1/26/2018	12:44:01 PM	245400	19.93
1/26/2018	12:49:01 PM	245700	19.94
1/26/2018	12:54:01 PM	246000	19.94
1/26/2018	12:59:01 PM	246300	19.95
1/26/2018	1:04:01 PM	246600	19.96
1/26/2018	1:09:01 PM	246900	19.97
1/26/2018	1:14:01 PM	247200	19.97
1/26/2018	1:19:01 PM	247500	19.97
1/26/2018	1:24:01 PM	247800	19.98
1/26/2018	1:29:01 PM	248100	19.99
1/26/2018	1:34:01 PM	248400	20
1/26/2018	1:39:01 PM	248700	20
1/26/2018	1:44:01 PM	249000	20.01
1/26/2018	1:49:01 PM	249300	20.01
1/26/2018	1:54:01 PM	249600	20.31
1/26/2018	1:59:01 PM	249900	20.82
1/26/2018	2:04:01 PM	250200	21.13
1/26/2018	2:09:01 PM	250500	21.35

17WW01 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/26/2018	2:14:01 PM	250800	21.49
1/26/2018	2:19:01 PM	251100	21.61
1/26/2018	2:24:01 PM	251400	21.69
1/26/2018	2:29:01 PM	251700	21.75
1/26/2018	2:34:01 PM	252000	21.81
1/26/2018	2:39:01 PM	252300	21.84
1/26/2018	2:44:01 PM	252600	21.87
1/26/2018	2:49:01 PM	252900	21.88
1/26/2018	2:54:01 PM	253200	21.9
1/26/2018	2:59:01 PM	253500	21.91
1/26/2018	3:04:01 PM	253800	21.93
1/26/2018	3:09:01 PM	254100	21.95
1/26/2018	3:14:01 PM	254400	21.97
1/26/2018	3:19:01 PM	254700	22
1/26/2018	3:24:01 PM	255000	22.01
1/26/2018	3:29:01 PM	255300	22.04
1/26/2018	3:34:01 PM	255600	22.06
1/26/2018	3:39:01 PM	255900	22.07
1/26/2018	3:44:01 PM	256200	22.09
1/26/2018	3:49:01 PM	256500	22.12
1/26/2018	3:54:01 PM	256800	22.16
1/26/2018	3:59:01 PM	257100	22.2
1/26/2018	4:04:01 PM	257400	22.24
1/26/2018	4:09:01 PM	257700	22.26
1/26/2018	4:14:01 PM	258000	22.27
1/26/2018	4:19:01 PM	258300	22.28
1/26/2018	4:24:01 PM	258600	22.29
1/26/2018	4:29:01 PM	258900	22.3
1/26/2018	4:34:01 PM	259200	22.31
1/26/2018	4:39:01 PM	259500	22.32
1/26/2018	4:44:01 PM	259800	22.33
1/26/2018	4:49:01 PM	260100	22.34
1/26/2018	4:54:01 PM	260400	22.36
1/26/2018	4:59:01 PM	260700	22.36
1/26/2018	5:03:04 PM	260943	22.36

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/23/2018	4:34:01 PM	0	9.95
1/23/2018	4:39:01 PM	300	11.85
1/23/2018	4:44:01 PM	600	12.95
1/23/2018	4:49:01 PM	900	13.92
1/23/2018	4:54:01 PM	1200	14.82
1/23/2018	4:59:01 PM	1500	15.4
1/23/2018	5:04:01 PM	1800	15.46
1/23/2018	5:09:01 PM	2100	15.76
1/23/2018	5:14:01 PM	2400	16.09
1/23/2018	5:19:01 PM	2700	16.39
1/23/2018	5:24:01 PM	3000	16.63
1/23/2018	5:29:01 PM	3300	16.82
1/23/2018	5:34:01 PM	3600	16.99
1/23/2018	5:39:01 PM	3900	17.2
1/23/2018	5:44:01 PM	4200	17.37
1/23/2018	5:49:01 PM	4500	17.49
1/23/2018	5:54:01 PM	4800	17.6
1/23/2018	5:59:01 PM	5100	17.68
1/23/2018	6:04:01 PM	5400	17.75
1/23/2018	6:09:01 PM	5700	17.8
1/23/2018	6:14:01 PM	6000	17.85
1/23/2018	6:19:01 PM	6300	17.88
1/23/2018	6:24:01 PM	6600	17.9
1/23/2018	6:29:01 PM	6900	17.92
1/23/2018	6:34:01 PM	7200	17.93
1/23/2018	6:39:01 PM	7500	17.95
1/23/2018	6:44:01 PM	7800	17.95
1/23/2018	6:49:01 PM	8100	17.96
1/23/2018	6:54:01 PM	8400	17.96
1/23/2018	6:59:01 PM	8700	17.97
1/23/2018	7:04:01 PM	9000	17.97
1/23/2018	7:09:01 PM	9300	17.98
1/23/2018	7:14:01 PM	9600	17.98
1/23/2018	7:19:01 PM	9900	17.97
1/23/2018	7:24:01 PM	10200	17.99
1/23/2018	7:29:01 PM	10500	17.98
1/23/2018	7:34:01 PM	10800	17.98
1/23/2018	7:39:01 PM	11100	17.97
1/23/2018	7:44:01 PM	11400	17.98
1/23/2018	7:49:01 PM	11700	17.98
1/23/2018	7:54:01 PM	12000	17.99
1/23/2018	7:59:01 PM	12300	17.99
1/23/2018	8:04:01 PM	12600	17.98
1/23/2018	8:09:01 PM	12900	17.99
1/23/2018	8:14:01 PM	13200	17.99

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/23/2018	8:19:01 PM	13500	18
1/23/2018	8:24:01 PM	13800	18.01
1/23/2018	8:29:01 PM	14100	18.02
1/23/2018	8:34:01 PM	14400	18.03
1/23/2018	8:39:01 PM	14700	18.04
1/23/2018	8:44:01 PM	15000	18.05
1/23/2018	8:49:01 PM	15300	18.05
1/23/2018	8:54:01 PM	15600	18.06
1/23/2018	8:59:01 PM	15900	18.07
1/23/2018	9:04:01 PM	16200	18.07
1/23/2018	9:09:01 PM	16500	18.07
1/23/2018	9:14:01 PM	16800	18.08
1/23/2018	9:19:01 PM	17100	18.08
1/23/2018	9:24:01 PM	17400	18.08
1/23/2018	9:29:01 PM	17700	18.09
1/23/2018	9:34:01 PM	18000	18.09
1/23/2018	9:39:01 PM	18300	18.09
1/23/2018	9:44:01 PM	18600	18.09
1/23/2018	9:49:01 PM	18900	18.09
1/23/2018	9:54:01 PM	19200	18.1
1/23/2018	9:59:01 PM	19500	18.1
1/23/2018	10:04:01 PM	19800	18.1
1/23/2018	10:09:01 PM	20100	18.11
1/23/2018	10:14:01 PM	20400	18.11
1/23/2018	10:19:01 PM	20700	18.11
1/23/2018	10:24:01 PM	21000	18.11
1/23/2018	10:29:01 PM	21300	18.11
1/23/2018	10:34:01 PM	21600	18.11
1/23/2018	10:39:01 PM	21900	18.11
1/23/2018	10:44:01 PM	22200	18.1
1/23/2018	10:49:01 PM	22500	18.12
1/23/2018	10:54:01 PM	22800	18.11
1/23/2018	10:59:01 PM	23100	18.12
1/23/2018	11:04:01 PM	23400	18.12
1/23/2018	11:09:01 PM	23700	18.13
1/23/2018	11:14:01 PM	24000	18.13
1/23/2018	11:19:01 PM	24300	18.13
1/23/2018	11:24:01 PM	24600	18.13
1/23/2018	11:29:01 PM	24900	18.14
1/23/2018	11:34:01 PM	25200	18.13
1/23/2018	11:39:01 PM	25500	18.13
1/23/2018	11:44:01 PM	25800	18.14
1/23/2018	11:49:01 PM	26100	18.14
1/23/2018	11:54:01 PM	26400	18.14
1/23/2018	11:59:01 PM	26700	18.14

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	12:04:01 AM	27000	18.14
1/24/2018	12:09:01 AM	27300	18.14
1/24/2018	12:14:01 AM	27600	18.14
1/24/2018	12:19:01 AM	27900	18.14
1/24/2018	12:24:01 AM	28200	18.14
1/24/2018	12:29:01 AM	28500	18.15
1/24/2018	12:34:01 AM	28800	18.14
1/24/2018	12:39:01 AM	29100	18.14
1/24/2018	12:44:01 AM	29400	18.14
1/24/2018	12:49:01 AM	29700	18.14
1/24/2018	12:54:01 AM	30000	18.13
1/24/2018	12:59:01 AM	30300	18.13
1/24/2018	1:04:01 AM	30600	18.14
1/24/2018	1:09:01 AM	30900	18.14
1/24/2018	1:14:01 AM	31200	18.14
1/24/2018	1:19:01 AM	31500	18.14
1/24/2018	1:24:01 AM	31800	18.14
1/24/2018	1:29:01 AM	32100	18.15
1/24/2018	1:34:01 AM	32400	18.14
1/24/2018	1:39:01 AM	32700	18.14
1/24/2018	1:44:01 AM	33000	18.14
1/24/2018	1:49:01 AM	33300	18.15
1/24/2018	1:54:01 AM	33600	18.15
1/24/2018	1:59:01 AM	33900	18.15
1/24/2018	2:04:01 AM	34200	18.15
1/24/2018	2:09:01 AM	34500	18.14
1/24/2018	2:14:01 AM	34800	18.15
1/24/2018	2:19:01 AM	35100	18.15
1/24/2018	2:24:01 AM	35400	18.16
1/24/2018	2:29:01 AM	35700	18.16
1/24/2018	2:34:01 AM	36000	18.16
1/24/2018	2:39:01 AM	36300	18.16
1/24/2018	2:44:01 AM	36600	18.16
1/24/2018	2:49:01 AM	36900	18.17
1/24/2018	2:54:01 AM	37200	18.17
1/24/2018	2:59:01 AM	37500	18.17
1/24/2018	3:04:01 AM	37800	18.17
1/24/2018	3:09:01 AM	38100	18.18
1/24/2018	3:14:01 AM	38400	18.18
1/24/2018	3:19:01 AM	38700	18.18
1/24/2018	3:24:01 AM	39000	18.18
1/24/2018	3:29:01 AM	39300	18.18
1/24/2018	3:34:01 AM	39600	18.18
1/24/2018	3:39:01 AM	39900	18.18
1/24/2018	3:44:01 AM	40200	18.18

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	3:49:01 AM	40500	18.18
1/24/2018	3:54:01 AM	40800	18.19
1/24/2018	3:59:01 AM	41100	18.19
1/24/2018	4:04:01 AM	41400	18.19
1/24/2018	4:09:01 AM	41700	18.2
1/24/2018	4:14:01 AM	42000	18.2
1/24/2018	4:19:01 AM	42300	18.19
1/24/2018	4:24:01 AM	42600	18.19
1/24/2018	4:29:01 AM	42900	18.2
1/24/2018	4:34:01 AM	43200	18.2
1/24/2018	4:39:01 AM	43500	18.19
1/24/2018	4:44:01 AM	43800	18.2
1/24/2018	4:49:01 AM	44100	18.2
1/24/2018	4:54:01 AM	44400	18.2
1/24/2018	4:59:01 AM	44700	18.2
1/24/2018	5:04:01 AM	45000	18.2
1/24/2018	5:09:01 AM	45300	18.2
1/24/2018	5:14:01 AM	45600	18.19
1/24/2018	5:19:01 AM	45900	18.19
1/24/2018	5:24:01 AM	46200	18.18
1/24/2018	5:29:01 AM	46500	18.18
1/24/2018	5:34:01 AM	46800	18.19
1/24/2018	5:39:01 AM	47100	18.18
1/24/2018	5:44:01 AM	47400	18.18
1/24/2018	5:49:01 AM	47700	18.18
1/24/2018	5:54:01 AM	48000	18.18
1/24/2018	5:59:01 AM	48300	18.18
1/24/2018	6:04:01 AM	48600	18.17
1/24/2018	6:09:01 AM	48900	18.17
1/24/2018	6:14:01 AM	49200	18.18
1/24/2018	6:19:01 AM	49500	18.18
1/24/2018	6:24:01 AM	49800	18.17
1/24/2018	6:29:01 AM	50100	18.19
1/24/2018	6:34:01 AM	50400	18.18
1/24/2018	6:39:01 AM	50700	18.18
1/24/2018	6:44:01 AM	51000	18.19
1/24/2018	6:49:01 AM	51300	18.19
1/24/2018	6:54:01 AM	51600	18.19
1/24/2018	6:59:01 AM	51900	18.19
1/24/2018	7:04:01 AM	52200	18.19
1/24/2018	7:09:01 AM	52500	18.19
1/24/2018	7:14:01 AM	52800	18.19
1/24/2018	7:19:01 AM	53100	18.17
1/24/2018	7:24:01 AM	53400	18.18
1/24/2018	7:29:01 AM	53700	18.18

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	7:34:01 AM	54000	18.19
1/24/2018	7:39:01 AM	54300	18.19
1/24/2018	7:44:01 AM	54600	18.18
1/24/2018	7:49:01 AM	54900	18.18
1/24/2018	7:54:01 AM	55200	18.17
1/24/2018	7:59:01 AM	55500	18.18
1/24/2018	8:04:01 AM	55800	18.19
1/24/2018	8:09:01 AM	56100	18.19
1/24/2018	8:14:01 AM	56400	18.2
1/24/2018	8:19:01 AM	56700	18.2
1/24/2018	8:24:01 AM	57000	18.2
1/24/2018	8:29:01 AM	57300	18.2
1/24/2018	8:34:01 AM	57600	18.2
1/24/2018	8:39:01 AM	57900	18.21
1/24/2018	8:44:01 AM	58200	18.21
1/24/2018	8:49:01 AM	58500	18.22
1/24/2018	8:54:01 AM	58800	18.23
1/24/2018	8:59:01 AM	59100	18.22
1/24/2018	9:04:01 AM	59400	18.23
1/24/2018	9:09:01 AM	59700	18.23
1/24/2018	9:14:01 AM	60000	18.23
1/24/2018	9:19:01 AM	60300	18.22
1/24/2018	9:24:01 AM	60600	18.23
1/24/2018	9:29:01 AM	60900	18.23
1/24/2018	9:34:01 AM	61200	18.23
1/24/2018	9:39:01 AM	61500	18.24
1/24/2018	9:44:01 AM	61800	18.23
1/24/2018	9:49:01 AM	62100	18.23
1/24/2018	9:54:01 AM	62400	18.23
1/24/2018	9:59:01 AM	62700	18.24
1/24/2018	10:04:01 AM	63000	18.24
1/24/2018	10:09:01 AM	63300	18.25
1/24/2018	10:14:01 AM	63600	18.25
1/24/2018	10:19:01 AM	63900	18.25
1/24/2018	10:24:01 AM	64200	18.26
1/24/2018	10:29:01 AM	64500	18.26
1/24/2018	10:34:01 AM	64800	18.27
1/24/2018	10:39:01 AM	65100	18.27
1/24/2018	10:44:01 AM	65400	18.27
1/24/2018	10:49:01 AM	65700	18.28
1/24/2018	10:54:01 AM	66000	18.28
1/24/2018	10:59:01 AM	66300	18.28
1/24/2018	11:04:01 AM	66600	18.29
1/24/2018	11:09:01 AM	66900	18.29
1/24/2018	11:14:01 AM	67200	18.29

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	11:19:01 AM	67500	18.29
1/24/2018	11:24:01 AM	67800	18.3
1/24/2018	11:29:01 AM	68100	18.3
1/24/2018	11:34:01 AM	68400	18.3
1/24/2018	11:39:01 AM	68700	18.3
1/24/2018	11:44:01 AM	69000	18.3
1/24/2018	11:49:01 AM	69300	18.3
1/24/2018	11:54:01 AM	69600	18.3
1/24/2018	11:59:01 AM	69900	18.31
1/24/2018	12:04:01 PM	70200	18.3
1/24/2018	12:09:01 PM	70500	18.1
1/24/2018	12:14:01 PM	70800	17.52
1/24/2018	12:19:01 PM	71100	16.87
1/24/2018	12:24:01 PM	71400	16.4
1/24/2018	12:29:01 PM	71700	17.39
1/24/2018	12:34:01 PM	72000	17.79
1/24/2018	12:39:01 PM	72300	17.89
1/24/2018	12:44:01 PM	72600	17.92
1/24/2018	12:49:01 PM	72900	17.95
1/24/2018	12:54:01 PM	73200	17.98
1/24/2018	12:59:01 PM	73500	18
1/24/2018	1:04:01 PM	73800	18.02
1/24/2018	1:09:01 PM	74100	18.06
1/24/2018	1:14:01 PM	74400	18.1
1/24/2018	1:19:01 PM	74700	18.12
1/24/2018	1:24:01 PM	75000	18.15
1/24/2018	1:29:01 PM	75300	18.16
1/24/2018	1:34:01 PM	75600	18.17
1/24/2018	1:39:01 PM	75900	18.18
1/24/2018	1:44:01 PM	76200	18.18
1/24/2018	1:49:01 PM	76500	18.18
1/24/2018	1:54:01 PM	76800	18.19
1/24/2018	1:59:01 PM	77100	18.18
1/24/2018	2:04:01 PM	77400	18.18
1/24/2018	2:09:01 PM	77700	18.19
1/24/2018	2:14:01 PM	78000	18.19
1/24/2018	2:19:01 PM	78300	18.18
1/24/2018	2:24:01 PM	78600	18.18
1/24/2018	2:29:01 PM	78900	18.18
1/24/2018	2:34:01 PM	79200	18.18
1/24/2018	2:39:01 PM	79500	18.2
1/24/2018	2:44:01 PM	79800	18.18
1/24/2018	2:49:01 PM	80100	18.19
1/24/2018	2:54:01 PM	80400	18.19
1/24/2018	2:59:01 PM	80700	18.07

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	3:04:01 PM	81000	17.58
1/24/2018	3:09:01 PM	81300	17.69
1/24/2018	3:14:01 PM	81600	18.07
1/24/2018	3:19:01 PM	81900	18.12
1/24/2018	3:24:01 PM	82200	18.16
1/24/2018	3:29:01 PM	82500	18.19
1/24/2018	3:34:01 PM	82800	18.22
1/24/2018	3:39:01 PM	83100	18.24
1/24/2018	3:44:01 PM	83400	18.25
1/24/2018	3:49:01 PM	83700	18.26
1/24/2018	3:54:01 PM	84000	18.26
1/24/2018	3:59:01 PM	84300	18.26
1/24/2018	4:04:01 PM	84600	18.26
1/24/2018	4:09:01 PM	84900	18.27
1/24/2018	4:14:01 PM	85200	18.28
1/24/2018	4:19:01 PM	85500	18.27
1/24/2018	4:24:01 PM	85800	18.26
1/24/2018	4:29:01 PM	86100	18.27
1/24/2018	4:34:01 PM	86400	18.29
1/24/2018	4:39:01 PM	86700	18.28
1/24/2018	4:44:01 PM	87000	18.28
1/24/2018	4:49:01 PM	87300	18.27
1/24/2018	4:54:01 PM	87600	17.98
1/24/2018	4:59:01 PM	87900	18.15
1/24/2018	5:04:01 PM	88200	18.14
1/24/2018	5:09:01 PM	88500	18.47
1/24/2018	5:14:01 PM	88800	18.44
1/24/2018	5:19:01 PM	89100	18.43
1/24/2018	5:24:01 PM	89400	18.43
1/24/2018	5:29:01 PM	89700	18.41
1/24/2018	5:34:01 PM	90000	18.41
1/24/2018	5:39:01 PM	90300	18.4
1/24/2018	5:44:01 PM	90600	18.4
1/24/2018	5:49:01 PM	90900	18.4
1/24/2018	5:54:01 PM	91200	18.39
1/24/2018	5:59:01 PM	91500	18.39
1/24/2018	6:04:01 PM	91800	18.38
1/24/2018	6:09:01 PM	92100	18.38
1/24/2018	6:14:01 PM	92400	18.39
1/24/2018	6:19:01 PM	92700	18.38
1/24/2018	6:24:01 PM	93000	18.39
1/24/2018	6:29:01 PM	93300	18.39
1/24/2018	6:34:01 PM	93600	18.4
1/24/2018	6:39:01 PM	93900	18.4
1/24/2018	6:44:01 PM	94200	18.39

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	6:49:01 PM	94500	18.4
1/24/2018	6:54:01 PM	94800	18.4
1/24/2018	6:59:01 PM	95100	18.4
1/24/2018	7:04:01 PM	95400	18.4
1/24/2018	7:09:01 PM	95700	18.42
1/24/2018	7:14:01 PM	96000	18.41
1/24/2018	7:19:01 PM	96300	18.41
1/24/2018	7:24:01 PM	96600	18.41
1/24/2018	7:29:01 PM	96900	18.42
1/24/2018	7:34:01 PM	97200	18.42
1/24/2018	7:39:01 PM	97500	18.42
1/24/2018	7:44:01 PM	97800	18.43
1/24/2018	7:49:01 PM	98100	18.4
1/24/2018	7:54:01 PM	98400	17.95
1/24/2018	7:59:01 PM	98700	18.68
1/24/2018	8:04:01 PM	99000	18.5
1/24/2018	8:09:01 PM	99300	18.13
1/24/2018	8:14:01 PM	99600	17.9
1/24/2018	8:19:01 PM	99900	17.94
1/24/2018	8:24:01 PM	100200	18.24
1/24/2018	8:29:01 PM	100500	18.23
1/24/2018	8:34:01 PM	100800	18.28
1/24/2018	8:39:01 PM	101100	18.31
1/24/2018	8:44:01 PM	101400	18.32
1/24/2018	8:49:01 PM	101700	18.34
1/24/2018	8:54:01 PM	102000	18.35
1/24/2018	8:59:01 PM	102300	18.35
1/24/2018	9:04:01 PM	102600	18.36
1/24/2018	9:09:01 PM	102900	18.36
1/24/2018	9:14:01 PM	103200	18.37
1/24/2018	9:19:01 PM	103500	18.37
1/24/2018	9:24:01 PM	103800	18.38
1/24/2018	9:29:01 PM	104100	18.38
1/24/2018	9:34:01 PM	104400	18.38
1/24/2018	9:39:01 PM	104700	18.39
1/24/2018	9:44:01 PM	105000	18.39
1/24/2018	9:49:01 PM	105300	18.39
1/24/2018	9:54:01 PM	105600	18.4
1/24/2018	9:59:01 PM	105900	18.4
1/24/2018	10:04:01 PM	106200	18.4
1/24/2018	10:09:01 PM	106500	18.4
1/24/2018	10:14:01 PM	106800	18.42
1/24/2018	10:19:01 PM	107100	18.43
1/24/2018	10:24:01 PM	107400	18.44
1/24/2018	10:29:01 PM	107700	18.45

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/24/2018	10:34:01 PM	108000	18.45
1/24/2018	10:39:01 PM	108300	18.46
1/24/2018	10:44:01 PM	108600	18.47
1/24/2018	10:49:01 PM	108900	18.46
1/24/2018	10:54:01 PM	109200	18.47
1/24/2018	10:59:01 PM	109500	18.47
1/24/2018	11:04:01 PM	109800	18.47
1/24/2018	11:09:01 PM	110100	18.47
1/24/2018	11:14:01 PM	110400	18.48
1/24/2018	11:19:01 PM	110700	18.48
1/24/2018	11:24:01 PM	111000	18.48
1/24/2018	11:29:01 PM	111300	18.48
1/24/2018	11:34:01 PM	111600	18.48
1/24/2018	11:39:01 PM	111900	18.48
1/24/2018	11:44:01 PM	112200	18.48
1/24/2018	11:49:01 PM	112500	18.49
1/24/2018	11:54:01 PM	112800	18.49
1/24/2018	11:59:01 PM	113100	18.49
1/25/2018	12:04:01 AM	113400	18.49
1/25/2018	12:09:01 AM	113700	18.46
1/25/2018	12:14:01 AM	114000	18.44
1/25/2018	12:19:01 AM	114300	18.44
1/25/2018	12:24:01 AM	114600	18.43
1/25/2018	12:29:01 AM	114900	18.42
1/25/2018	12:34:01 AM	115200	18.42
1/25/2018	12:39:01 AM	115500	18.41
1/25/2018	12:44:01 AM	115800	18.41
1/25/2018	12:49:01 AM	116100	18.41
1/25/2018	12:54:01 AM	116400	18.4
1/25/2018	12:59:01 AM	116700	18.4
1/25/2018	1:04:01 AM	117000	18.4
1/25/2018	1:09:01 AM	117300	18.4
1/25/2018	1:14:01 AM	117600	18.4
1/25/2018	1:19:01 AM	117900	18.4
1/25/2018	1:24:01 AM	118200	18.4
1/25/2018	1:29:01 AM	118500	18.4
1/25/2018	1:34:01 AM	118800	18.4
1/25/2018	1:39:01 AM	119100	18.4
1/25/2018	1:44:01 AM	119400	18.41
1/25/2018	1:49:01 AM	119700	18.41
1/25/2018	1:54:01 AM	120000	18.41
1/25/2018	1:59:01 AM	120300	18.42
1/25/2018	2:04:01 AM	120600	18.42
1/25/2018	2:09:01 AM	120900	18.37
1/25/2018	2:14:01 AM	121200	17.99

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/25/2018	2:19:01 AM	121500	18.07
1/25/2018	2:24:01 AM	121800	18.37
1/25/2018	2:29:01 AM	122100	18.38
1/25/2018	2:34:01 AM	122400	18.37
1/25/2018	2:39:01 AM	122700	18.36
1/25/2018	2:44:01 AM	123000	18.36
1/25/2018	2:49:01 AM	123300	18.35
1/25/2018	2:54:01 AM	123600	18.34
1/25/2018	2:59:01 AM	123900	18.33
1/25/2018	3:04:01 AM	124200	18.34
1/25/2018	3:09:01 AM	124500	18.34
1/25/2018	3:14:01 AM	124800	18.35
1/25/2018	3:19:01 AM	125100	18.35
1/25/2018	3:24:01 AM	125400	18.35
1/25/2018	3:29:01 AM	125700	18.35
1/25/2018	3:34:01 AM	126000	18.36
1/25/2018	3:39:01 AM	126300	18.36
1/25/2018	3:44:01 AM	126600	18.36
1/25/2018	3:49:01 AM	126900	18.36
1/25/2018	3:54:01 AM	127200	18.37
1/25/2018	3:59:01 AM	127500	18.37
1/25/2018	4:04:01 AM	127800	18.38
1/25/2018	4:09:01 AM	128100	18.39
1/25/2018	4:14:01 AM	128400	18.39
1/25/2018	4:19:01 AM	128700	18.39
1/25/2018	4:24:01 AM	129000	18.38
1/25/2018	4:29:01 AM	129300	18.39
1/25/2018	4:34:01 AM	129600	18.4
1/25/2018	4:39:01 AM	129900	18.39
1/25/2018	4:44:01 AM	130200	18.31
1/25/2018	4:49:01 AM	130500	17.82
1/25/2018	4:54:01 AM	130800	17.95
1/25/2018	4:59:01 AM	131100	18.35
1/25/2018	5:04:01 AM	131400	18.17
1/25/2018	5:09:01 AM	131700	18.42
1/25/2018	5:14:01 AM	132000	18.76
1/25/2018	5:19:01 AM	132300	18.8
1/25/2018	5:24:01 AM	132600	18.83
1/25/2018	5:29:01 AM	132900	18.84
1/25/2018	5:34:01 AM	133200	18.82
1/25/2018	5:39:01 AM	133500	18.79
1/25/2018	5:44:01 AM	133800	18.77
1/25/2018	5:49:01 AM	134100	18.78
1/25/2018	5:54:01 AM	134400	18.77
1/25/2018	5:59:01 AM	134700	18.77

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/25/2018	6:04:01 AM	135000	18.78
1/25/2018	6:09:01 AM	135300	18.78
1/25/2018	6:14:01 AM	135600	18.79
1/25/2018	6:19:01 AM	135900	18.79
1/25/2018	6:24:01 AM	136200	18.8
1/25/2018	6:29:01 AM	136500	18.8
1/25/2018	6:34:01 AM	136800	18.8
1/25/2018	6:39:01 AM	137100	18.8
1/25/2018	6:44:01 AM	137400	18.81
1/25/2018	6:49:01 AM	137700	18.81
1/25/2018	6:54:01 AM	138000	18.82
1/25/2018	6:59:01 AM	138300	18.61
1/25/2018	7:04:01 AM	138600	17.91
1/25/2018	7:09:01 AM	138900	18.32
1/25/2018	7:14:01 AM	139200	18.92
1/25/2018	7:19:01 AM	139500	18.48
1/25/2018	7:24:01 AM	139800	18.21
1/25/2018	7:29:01 AM	140100	18.33
1/25/2018	7:34:01 AM	140400	18.11
1/25/2018	7:39:01 AM	140700	18.18
1/25/2018	7:44:01 AM	141000	18.06
1/25/2018	7:49:01 AM	141300	18.17
1/25/2018	7:54:01 AM	141600	18.35
1/25/2018	7:59:01 AM	141900	18.4
1/25/2018	8:04:01 AM	142200	18.32
1/25/2018	8:09:01 AM	142500	18.45
1/25/2018	8:14:01 AM	142800	18.61
1/25/2018	8:19:01 AM	143100	18.75
1/25/2018	8:24:01 AM	143400	18.77
1/25/2018	8:29:01 AM	143700	18.66
1/25/2018	8:34:01 AM	144000	18.55
1/25/2018	8:39:01 AM	144300	18.45
1/25/2018	8:44:01 AM	144600	18.55
1/25/2018	8:49:01 AM	144900	18.61
1/25/2018	8:54:01 AM	145200	18.54
1/25/2018	8:59:01 AM	145500	18.5
1/25/2018	9:04:01 AM	145800	18.54
1/25/2018	9:09:01 AM	146100	18.61
1/25/2018	9:14:01 AM	146400	18.52
1/25/2018	9:19:01 AM	146700	18.48
1/25/2018	9:24:01 AM	147000	18.52
1/25/2018	9:29:01 AM	147300	18.55
1/25/2018	9:34:01 AM	147600	18.53
1/25/2018	9:39:01 AM	147900	18.55
1/25/2018	9:44:01 AM	148200	18.53

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/25/2018	9:49:01 AM	148500	18.54
1/25/2018	9:54:01 AM	148800	18.59
1/25/2018	9:59:01 AM	149100	18.59
1/25/2018	10:04:01 AM	149400	18.59
1/25/2018	10:09:01 AM	149700	18.61
1/25/2018	10:14:01 AM	150000	18.58
1/25/2018	10:19:01 AM	150300	18.52
1/25/2018	10:24:01 AM	150600	18.53
1/25/2018	10:29:01 AM	150900	18.57
1/25/2018	10:34:01 AM	151200	18.53
1/25/2018	10:39:01 AM	151500	18.48
1/25/2018	10:44:01 AM	151800	18.56
1/25/2018	10:49:01 AM	152100	18.58
1/25/2018	10:54:01 AM	152400	18.58
1/25/2018	10:59:01 AM	152700	18.59
1/25/2018	11:04:01 AM	153000	18.58
1/25/2018	11:09:01 AM	153300	18.54
1/25/2018	11:14:01 AM	153600	18.56
1/25/2018	11:19:01 AM	153900	18.6
1/25/2018	11:24:01 AM	154200	18.57
1/25/2018	11:29:01 AM	154500	18.59
1/25/2018	11:34:01 AM	154800	18.58
1/25/2018	11:39:01 AM	155100	18.59
1/25/2018	11:44:01 AM	155400	18.6
1/25/2018	11:49:01 AM	155700	18.57
1/25/2018	11:54:01 AM	156000	18.59
1/25/2018	11:59:01 AM	156300	18.59
1/25/2018	12:04:01 PM	156600	18.51
1/25/2018	12:09:01 PM	156900	18.53
1/25/2018	12:14:01 PM	157200	18.58
1/25/2018	12:19:01 PM	157500	18.56
1/25/2018	12:24:01 PM	157800	18.6
1/25/2018	12:29:01 PM	158100	18.6
1/25/2018	12:34:01 PM	158400	18.62
1/25/2018	12:39:01 PM	158700	18.47
1/25/2018	12:44:01 PM	159000	18.52
1/25/2018	12:49:01 PM	159300	18.56
1/25/2018	12:54:01 PM	159600	18.45
1/25/2018	12:59:01 PM	159900	18.66
1/25/2018	1:04:01 PM	160200	18.75
1/25/2018	1:09:01 PM	160500	18.42
1/25/2018	1:14:01 PM	160800	18.56
1/25/2018	1:19:01 PM	161100	18.74
1/25/2018	1:24:01 PM	161400	18.78
1/25/2018	1:29:01 PM	161700	18.8

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/25/2018	1:34:01 PM	162000	18.79
1/25/2018	1:39:01 PM	162300	18.8
1/25/2018	1:44:01 PM	162600	18.79
1/25/2018	1:49:01 PM	162900	18.79
1/25/2018	1:54:01 PM	163200	18.78
1/25/2018	1:59:01 PM	163500	18.79
1/25/2018	2:04:01 PM	163800	18.78
1/25/2018	2:09:01 PM	164100	18.79
1/25/2018	2:14:01 PM	164400	18.8
1/25/2018	2:19:01 PM	164700	18.8
1/25/2018	2:24:01 PM	165000	18.8
1/25/2018	2:29:01 PM	165300	18.8
1/25/2018	2:34:01 PM	165600	18.81
1/25/2018	2:39:01 PM	165900	18.81
1/25/2018	2:44:01 PM	166200	18.81
1/25/2018	2:49:01 PM	166500	18.8
1/25/2018	2:54:01 PM	166800	18.79
1/25/2018	2:59:01 PM	167100	18.79
1/25/2018	3:04:01 PM	167400	18.8
1/25/2018	3:09:01 PM	167700	18.8
1/25/2018	3:14:01 PM	168000	18.79
1/25/2018	3:19:01 PM	168300	18.79
1/25/2018	3:24:01 PM	168600	18.79
1/25/2018	3:29:01 PM	168900	18.78
1/25/2018	3:34:01 PM	169200	18.77
1/25/2018	3:39:01 PM	169500	18.76
1/25/2018	3:44:01 PM	169800	18.75
1/25/2018	3:49:01 PM	170100	18.7
1/25/2018	3:54:01 PM	170400	18.67
1/25/2018	3:59:01 PM	170700	18.65
1/25/2018	4:04:01 PM	171000	18.63
1/25/2018	4:09:01 PM	171300	18.61
1/25/2018	4:14:01 PM	171600	18.61
1/25/2018	4:19:01 PM	171900	18.59
1/25/2018	4:24:01 PM	172200	18.57
1/25/2018	4:29:01 PM	172500	18.56
1/25/2018	4:34:01 PM	172800	18.43
1/25/2018	4:39:01 PM	173100	18.43
1/25/2018	4:44:01 PM	173400	18.64
1/25/2018	4:49:01 PM	173700	18.61
1/25/2018	4:54:01 PM	174000	18.57
1/25/2018	4:59:01 PM	174300	18.55
1/25/2018	5:04:01 PM	174600	18.53
1/25/2018	5:09:01 PM	174900	18.52
1/25/2018	5:14:01 PM	175200	18.52

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/25/2018	5:19:01 PM	175500	18.5
1/25/2018	5:24:01 PM	175800	18.5
1/25/2018	5:29:01 PM	176100	18.49
1/25/2018	5:34:01 PM	176400	18.49
1/25/2018	5:39:01 PM	176700	18.5
1/25/2018	5:44:01 PM	177000	18.49
1/25/2018	5:49:01 PM	177300	18.5
1/25/2018	5:54:01 PM	177600	18.5
1/25/2018	5:59:01 PM	177900	18.49
1/25/2018	6:04:01 PM	178200	18.48
1/25/2018	6:09:01 PM	178500	18.48
1/25/2018	6:14:01 PM	178800	18.48
1/25/2018	6:19:01 PM	179100	18.49
1/25/2018	6:24:01 PM	179400	18.5
1/25/2018	6:29:01 PM	179700	18.49
1/25/2018	6:34:01 PM	180000	18.5
1/25/2018	6:39:01 PM	180300	18.5
1/25/2018	6:44:01 PM	180600	18.49
1/25/2018	6:49:01 PM	180900	18.49
1/25/2018	6:54:01 PM	181200	18.5
1/25/2018	6:59:01 PM	181500	18.5
1/25/2018	7:04:01 PM	181800	18.5
1/25/2018	7:09:01 PM	182100	18.49
1/25/2018	7:14:01 PM	182400	18.5
1/25/2018	7:19:01 PM	182700	18.51
1/25/2018	7:24:01 PM	183000	18.51
1/25/2018	7:29:01 PM	183300	18.51
1/25/2018	7:34:01 PM	183600	18.52
1/25/2018	7:39:01 PM	183900	18.52
1/25/2018	7:44:01 PM	184200	18.49
1/25/2018	7:49:01 PM	184500	18.12
1/25/2018	7:54:01 PM	184800	17.8
1/25/2018	7:59:01 PM	185100	18.2
1/25/2018	8:04:01 PM	185400	18.39
1/25/2018	8:09:01 PM	185700	18.5
1/25/2018	8:14:01 PM	186000	18.59
1/25/2018	8:19:01 PM	186300	18.63
1/25/2018	8:24:01 PM	186600	18.65
1/25/2018	8:29:01 PM	186900	18.67
1/25/2018	8:34:01 PM	187200	18.68
1/25/2018	8:39:01 PM	187500	18.69
1/25/2018	8:44:01 PM	187800	18.68
1/25/2018	8:49:01 PM	188100	18.69
1/25/2018	8:54:01 PM	188400	18.69
1/25/2018	8:59:01 PM	188700	18.69

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/25/2018	9:04:01 PM	189000	18.69
1/25/2018	9:09:01 PM	189300	18.7
1/25/2018	9:14:01 PM	189600	18.71
1/25/2018	9:19:01 PM	189900	18.72
1/25/2018	9:24:01 PM	190200	18.73
1/25/2018	9:29:01 PM	190500	18.73
1/25/2018	9:34:01 PM	190800	18.73
1/25/2018	9:39:01 PM	191100	18.74
1/25/2018	9:44:01 PM	191400	18.75
1/25/2018	9:49:01 PM	191700	18.75
1/25/2018	9:54:01 PM	192000	18.75
1/25/2018	9:59:01 PM	192300	18.76
1/25/2018	10:04:01 PM	192600	18.77
1/25/2018	10:09:01 PM	192900	18.76
1/25/2018	10:14:01 PM	193200	18.75
1/25/2018	10:19:01 PM	193500	18.75
1/25/2018	10:24:01 PM	193800	18.76
1/25/2018	10:29:01 PM	194100	18.77
1/25/2018	10:34:01 PM	194400	18.77
1/25/2018	10:39:01 PM	194700	18.75
1/25/2018	10:44:01 PM	195000	18.35
1/25/2018	10:49:01 PM	195300	17.64
1/25/2018	10:54:01 PM	195600	18.43
1/25/2018	10:59:01 PM	195900	18.83
1/25/2018	11:04:01 PM	196200	19.2
1/25/2018	11:09:01 PM	196500	19.13
1/25/2018	11:14:01 PM	196800	19.04
1/25/2018	11:19:01 PM	197100	18.95
1/25/2018	11:24:01 PM	197400	18.91
1/25/2018	11:29:01 PM	197700	18.89
1/25/2018	11:34:01 PM	198000	18.87
1/25/2018	11:39:01 PM	198300	18.85
1/25/2018	11:44:01 PM	198600	18.84
1/25/2018	11:49:01 PM	198900	18.84
1/25/2018	11:54:01 PM	199200	18.83
1/25/2018	11:59:01 PM	199500	18.83
1/26/2018	12:04:01 AM	199800	18.84
1/26/2018	12:09:01 AM	200100	18.85
1/26/2018	12:14:01 AM	200400	18.84
1/26/2018	12:19:01 AM	200700	18.84
1/26/2018	12:24:01 AM	201000	18.84
1/26/2018	12:29:01 AM	201300	18.85
1/26/2018	12:34:01 AM	201600	18.86
1/26/2018	12:39:01 AM	201900	18.86
1/26/2018	12:44:01 AM	202200	18.87

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	12:49:01 AM	202500	18.88
1/26/2018	12:54:01 AM	202800	18.89
1/26/2018	12:59:01 AM	203100	18.9
1/26/2018	1:04:01 AM	203400	18.9
1/26/2018	1:09:01 AM	203700	18.91
1/26/2018	1:14:01 AM	204000	18.92
1/26/2018	1:19:01 AM	204300	18.92
1/26/2018	1:24:01 AM	204600	18.92
1/26/2018	1:29:01 AM	204900	18.94
1/26/2018	1:34:01 AM	205200	18.93
1/26/2018	1:39:01 AM	205500	18.94
1/26/2018	1:44:01 AM	205800	18.94
1/26/2018	1:49:01 AM	206100	18.94
1/26/2018	1:54:01 AM	206400	18.94
1/26/2018	1:59:01 AM	206700	18.55
1/26/2018	2:04:01 AM	207000	17.85
1/26/2018	2:09:01 AM	207300	17.23
1/26/2018	2:14:01 AM	207600	16.66
1/26/2018	2:19:01 AM	207900	16.16
1/26/2018	2:24:01 AM	208200	15.65
1/26/2018	2:29:01 AM	208500	15.16
1/26/2018	2:34:01 AM	208800	14.39
1/26/2018	2:39:01 AM	209100	17.55
1/26/2018	2:44:01 AM	209400	18.06
1/26/2018	2:49:01 AM	209700	18.23
1/26/2018	2:54:01 AM	210000	18.41
1/26/2018	2:59:01 AM	210300	18.48
1/26/2018	3:04:01 AM	210600	18.52
1/26/2018	3:09:01 AM	210900	18.57
1/26/2018	3:14:01 AM	211200	18.61
1/26/2018	3:19:01 AM	211500	18.65
1/26/2018	3:24:01 AM	211800	18.69
1/26/2018	3:29:01 AM	212100	18.72
1/26/2018	3:34:01 AM	212400	18.74
1/26/2018	3:39:01 AM	212700	18.75
1/26/2018	3:44:01 AM	213000	18.77
1/26/2018	3:49:01 AM	213300	18.77
1/26/2018	3:54:01 AM	213600	18.78
1/26/2018	3:59:01 AM	213900	18.79
1/26/2018	4:04:01 AM	214200	18.79
1/26/2018	4:09:01 AM	214500	18.79
1/26/2018	4:14:01 AM	214800	18.77
1/26/2018	4:19:01 AM	215100	18.75
1/26/2018	4:24:01 AM	215400	18.74
1/26/2018	4:29:01 AM	215700	18.73

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	4:34:01 AM	216000	18.73
1/26/2018	4:39:01 AM	216300	18.73
1/26/2018	4:44:01 AM	216600	18.73
1/26/2018	4:49:01 AM	216900	18.73
1/26/2018	4:54:01 AM	217200	18.73
1/26/2018	4:59:01 AM	217500	18.73
1/26/2018	5:04:01 AM	217800	18.73
1/26/2018	5:09:01 AM	218100	18.73
1/26/2018	5:14:01 AM	218400	18.72
1/26/2018	5:19:01 AM	218700	18.71
1/26/2018	5:24:01 AM	219000	18.7
1/26/2018	5:29:01 AM	219300	18.69
1/26/2018	5:34:01 AM	219600	18.68
1/26/2018	5:39:01 AM	219900	18.71
1/26/2018	5:44:01 AM	220200	18.73
1/26/2018	5:49:01 AM	220500	18.74
1/26/2018	5:54:01 AM	220800	18.75
1/26/2018	5:59:01 AM	221100	18.76
1/26/2018	6:04:01 AM	221400	18.77
1/26/2018	6:09:01 AM	221700	18.76
1/26/2018	6:14:01 AM	222000	18.76
1/26/2018	6:19:01 AM	222300	18.79
1/26/2018	6:24:01 AM	222600	18.8
1/26/2018	6:29:01 AM	222900	18.81
1/26/2018	6:34:01 AM	223200	18.82
1/26/2018	6:39:01 AM	223500	18.82
1/26/2018	6:44:01 AM	223800	18.83
1/26/2018	6:49:01 AM	224100	18.83
1/26/2018	6:54:01 AM	224400	18.84
1/26/2018	6:59:01 AM	224700	18.85
1/26/2018	7:04:01 AM	225000	18.84
1/26/2018	7:09:01 AM	225300	18.85
1/26/2018	7:14:01 AM	225600	18.86
1/26/2018	7:19:01 AM	225900	18.87
1/26/2018	7:24:01 AM	226200	18.88
1/26/2018	7:29:01 AM	226500	18.88
1/26/2018	7:34:01 AM	226800	18.89
1/26/2018	7:39:01 AM	227100	18.88
1/26/2018	7:44:01 AM	227400	18.89
1/26/2018	7:49:01 AM	227700	18.91
1/26/2018	7:54:01 AM	228000	18.92
1/26/2018	7:59:01 AM	228300	18.93
1/26/2018	8:04:01 AM	228600	18.94
1/26/2018	8:09:01 AM	228900	18.94
1/26/2018	8:14:01 AM	229200	18.95

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	8:19:01 AM	229500	18.94
1/26/2018	8:24:01 AM	229800	18.9
1/26/2018	8:29:01 AM	230100	18.9
1/26/2018	8:34:01 AM	230400	18.91
1/26/2018	8:39:01 AM	230700	18.91
1/26/2018	8:44:01 AM	231000	18.9
1/26/2018	8:49:01 AM	231300	18.68
1/26/2018	8:54:01 AM	231600	18.11
1/26/2018	8:59:01 AM	231900	18.75
1/26/2018	9:04:01 AM	232200	18.67
1/26/2018	9:09:01 AM	232500	18.67
1/26/2018	9:14:01 AM	232800	18.67
1/26/2018	9:19:01 AM	233100	18.66
1/26/2018	9:24:01 AM	233400	18.67
1/26/2018	9:29:01 AM	233700	18.66
1/26/2018	9:34:01 AM	234000	18.64
1/26/2018	9:39:01 AM	234300	18.64
1/26/2018	9:44:01 AM	234600	18.64
1/26/2018	9:49:01 AM	234900	18.64
1/26/2018	9:54:01 AM	235200	18.63
1/26/2018	9:59:01 AM	235500	18.63
1/26/2018	10:04:01 AM	235800	18.63
1/26/2018	10:09:01 AM	236100	18.64
1/26/2018	10:14:01 AM	236400	18.64
1/26/2018	10:19:01 AM	236700	18.64
1/26/2018	10:24:01 AM	237000	18.65
1/26/2018	10:29:01 AM	237300	18.65
1/26/2018	10:34:01 AM	237600	18.65
1/26/2018	10:39:01 AM	237900	18.68
1/26/2018	10:44:01 AM	238200	18.68
1/26/2018	10:49:01 AM	238500	18.68
1/26/2018	10:54:01 AM	238800	18.69
1/26/2018	10:59:01 AM	239100	18.69
1/26/2018	11:04:01 AM	239400	18.7
1/26/2018	11:09:01 AM	239700	18.7
1/26/2018	11:14:01 AM	240000	18.7
1/26/2018	11:19:01 AM	240300	18.7
1/26/2018	11:24:01 AM	240600	18.72
1/26/2018	11:29:01 AM	240900	18.72
1/26/2018	11:34:01 AM	241200	18.72
1/26/2018	11:39:01 AM	241500	18.72
1/26/2018	11:44:01 AM	241800	18.74
1/26/2018	11:49:01 AM	242100	18.75
1/26/2018	11:54:01 AM	242400	18.75
1/26/2018	11:59:01 AM	242700	18.75

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	12:04:01 PM	243000	18.75
1/26/2018	12:09:01 PM	243300	18.76
1/26/2018	12:14:01 PM	243600	18.76
1/26/2018	12:19:01 PM	243900	18.77
1/26/2018	12:24:01 PM	244200	18.78
1/26/2018	12:29:01 PM	244500	18.78
1/26/2018	12:34:01 PM	244800	18.78
1/26/2018	12:39:01 PM	245100	18.78
1/26/2018	12:44:01 PM	245400	18.78
1/26/2018	12:49:01 PM	245700	18.79
1/26/2018	12:54:01 PM	246000	18.8
1/26/2018	12:59:01 PM	246300	18.79
1/26/2018	1:04:01 PM	246600	18.79
1/26/2018	1:09:01 PM	246900	18.79
1/26/2018	1:14:01 PM	247200	18.8
1/26/2018	1:19:01 PM	247500	18.79
1/26/2018	1:24:01 PM	247800	18.8
1/26/2018	1:29:01 PM	248100	18.8
1/26/2018	1:34:01 PM	248400	18.8
1/26/2018	1:39:01 PM	248700	18.8
1/26/2018	1:44:01 PM	249000	18.81
1/26/2018	1:49:01 PM	249300	18.81
1/26/2018	1:54:01 PM	249600	18.81
1/26/2018	1:59:01 PM	249900	18.81
1/26/2018	2:04:01 PM	250200	18.81
1/26/2018	2:09:01 PM	250500	18.82
1/26/2018	2:14:01 PM	250800	18.81
1/26/2018	2:19:01 PM	251100	18.82
1/26/2018	2:24:01 PM	251400	18.81
1/26/2018	2:29:01 PM	251700	18.81
1/26/2018	2:34:01 PM	252000	18.8
1/26/2018	2:39:01 PM	252300	18.8
1/26/2018	2:44:01 PM	252600	18.8
1/26/2018	2:49:01 PM	252900	18.8
1/26/2018	2:54:01 PM	253200	18.79
1/26/2018	2:59:01 PM	253500	18.66
1/26/2018	3:04:01 PM	253800	18.82
1/26/2018	3:09:01 PM	254100	18.88
1/26/2018	3:14:01 PM	254400	18.78
1/26/2018	3:19:01 PM	254700	18.77
1/26/2018	3:24:01 PM	255000	18.85
1/26/2018	3:29:01 PM	255300	18.92
1/26/2018	3:34:01 PM	255600	18.95
1/26/2018	3:39:01 PM	255900	18.92
1/26/2018	3:44:01 PM	256200	18.9

17WW02 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	3:49:01 PM	256500	18.85
1/26/2018	3:54:01 PM	256800	18.74
1/26/2018	3:59:01 PM	257100	18.79
1/26/2018	4:04:01 PM	257400	18.79
1/26/2018	4:09:01 PM	257700	18.8
1/26/2018	4:14:01 PM	258000	18.81
1/26/2018	4:19:01 PM	258300	18.81
1/26/2018	4:24:01 PM	258600	18.81
1/26/2018	4:29:01 PM	258900	18.81
1/26/2018	4:34:01 PM	259200	18.81
1/26/2018	4:39:01 PM	259500	18.81
1/26/2018	4:44:01 PM	259800	18.8
1/26/2018	4:49:01 PM	260100	18.81
1/26/2018	4:54:01 PM	260400	18.65
1/26/2018	4:59:01 PM	260700	18.82
1/26/2018	5:03:04 PM	260943	18.9

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/23/2018	4:34:01 PM	0	11.7
1/23/2018	4:39:01 PM	300	11.7
1/23/2018	4:44:01 PM	600	11.7
1/23/2018	4:49:01 PM	900	11.7
1/23/2018	4:54:01 PM	1200	11.7
1/23/2018	4:59:01 PM	1500	11.71
1/23/2018	5:04:01 PM	1800	11.71
1/23/2018	5:09:01 PM	2100	11.7
1/23/2018	5:14:01 PM	2400	11.71
1/23/2018	5:19:01 PM	2700	11.71
1/23/2018	5:24:01 PM	3000	11.71
1/23/2018	5:29:01 PM	3300	11.71
1/23/2018	5:34:01 PM	3600	11.71
1/23/2018	5:39:01 PM	3900	11.72
1/23/2018	5:44:01 PM	4200	11.71
1/23/2018	5:49:01 PM	4500	11.72
1/23/2018	5:54:01 PM	4800	11.72
1/23/2018	5:59:01 PM	5100	11.72
1/23/2018	6:04:01 PM	5400	11.72
1/23/2018	6:09:01 PM	5700	11.72
1/23/2018	6:14:01 PM	6000	11.72
1/23/2018	6:19:01 PM	6300	11.73
1/23/2018	6:24:01 PM	6600	11.73
1/23/2018	6:29:01 PM	6900	11.73
1/23/2018	6:34:01 PM	7200	11.73
1/23/2018	6:39:01 PM	7500	11.73
1/23/2018	6:44:01 PM	7800	11.73
1/23/2018	6:49:01 PM	8100	11.73
1/23/2018	6:54:01 PM	8400	11.74
1/23/2018	6:59:01 PM	8700	11.73
1/23/2018	7:04:01 PM	9000	11.74
1/23/2018	7:09:01 PM	9300	11.74
1/23/2018	7:14:01 PM	9600	11.74
1/23/2018	7:19:01 PM	9900	11.74
1/23/2018	7:24:01 PM	10200	11.74
1/23/2018	7:29:01 PM	10500	11.74
1/23/2018	7:34:01 PM	10800	11.74
1/23/2018	7:39:01 PM	11100	11.74
1/23/2018	7:44:01 PM	11400	11.75
1/23/2018	7:49:01 PM	11700	11.74
1/23/2018	7:54:01 PM	12000	11.74
1/23/2018	7:59:01 PM	12300	11.75
1/23/2018	8:04:01 PM	12600	11.75
1/23/2018	8:09:01 PM	12900	11.75

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/23/2018	8:14:01 PM	13200	11.75
1/23/2018	8:19:01 PM	13500	11.75
1/23/2018	8:24:01 PM	13800	11.75
1/23/2018	8:29:01 PM	14100	11.74
1/23/2018	8:34:01 PM	14400	11.75
1/23/2018	8:39:01 PM	14700	11.75
1/23/2018	8:44:01 PM	15000	11.75
1/23/2018	8:49:01 PM	15300	11.75
1/23/2018	8:54:01 PM	15600	11.75
1/23/2018	8:59:01 PM	15900	11.75
1/23/2018	9:04:01 PM	16200	11.75
1/23/2018	9:09:01 PM	16500	11.75
1/23/2018	9:14:01 PM	16800	11.75
1/23/2018	9:19:01 PM	17100	11.75
1/23/2018	9:24:01 PM	17400	11.75
1/23/2018	9:29:01 PM	17700	11.75
1/23/2018	9:34:01 PM	18000	11.75
1/23/2018	9:39:01 PM	18300	11.75
1/23/2018	9:44:01 PM	18600	11.75
1/23/2018	9:49:01 PM	18900	11.75
1/23/2018	9:54:01 PM	19200	11.75
1/23/2018	9:59:01 PM	19500	11.75
1/23/2018	10:04:01 PM	19800	11.75
1/23/2018	10:09:01 PM	20100	11.76
1/23/2018	10:14:01 PM	20400	11.75
1/23/2018	10:19:01 PM	20700	11.75
1/23/2018	10:24:01 PM	21000	11.75
1/23/2018	10:29:01 PM	21300	11.75
1/23/2018	10:34:01 PM	21600	11.75
1/23/2018	10:39:01 PM	21900	11.75
1/23/2018	10:44:01 PM	22200	11.75
1/23/2018	10:49:01 PM	22500	11.74
1/23/2018	10:54:01 PM	22800	11.74
1/23/2018	10:59:01 PM	23100	11.75
1/23/2018	11:04:01 PM	23400	11.75
1/23/2018	11:09:01 PM	23700	11.74
1/23/2018	11:14:01 PM	24000	11.74
1/23/2018	11:19:01 PM	24300	11.75
1/23/2018	11:24:01 PM	24600	11.75
1/23/2018	11:29:01 PM	24900	11.75
1/23/2018	11:34:01 PM	25200	11.75
1/23/2018	11:39:01 PM	25500	11.75
1/23/2018	11:44:01 PM	25800	11.75
1/23/2018	11:49:01 PM	26100	11.75

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/23/2018	11:54:01 PM	26400	11.75
1/23/2018	11:59:01 PM	26700	11.75
1/24/2018	12:04:01 AM	27000	11.75
1/24/2018	12:09:01 AM	27300	11.75
1/24/2018	12:14:01 AM	27600	11.75
1/24/2018	12:19:01 AM	27900	11.75
1/24/2018	12:24:01 AM	28200	11.75
1/24/2018	12:29:01 AM	28500	11.75
1/24/2018	12:34:01 AM	28800	11.75
1/24/2018	12:39:01 AM	29100	11.75
1/24/2018	12:44:01 AM	29400	11.75
1/24/2018	12:49:01 AM	29700	11.75
1/24/2018	12:54:01 AM	30000	11.76
1/24/2018	12:59:01 AM	30300	11.75
1/24/2018	1:04:01 AM	30600	11.75
1/24/2018	1:09:01 AM	30900	11.75
1/24/2018	1:14:01 AM	31200	11.75
1/24/2018	1:19:01 AM	31500	11.76
1/24/2018	1:24:01 AM	31800	11.75
1/24/2018	1:29:01 AM	32100	11.76
1/24/2018	1:34:01 AM	32400	11.75
1/24/2018	1:39:01 AM	32700	11.75
1/24/2018	1:44:01 AM	33000	11.75
1/24/2018	1:49:01 AM	33300	11.75
1/24/2018	1:54:01 AM	33600	11.75
1/24/2018	1:59:01 AM	33900	11.76
1/24/2018	2:04:01 AM	34200	11.76
1/24/2018	2:09:01 AM	34500	11.76
1/24/2018	2:14:01 AM	34800	11.76
1/24/2018	2:19:01 AM	35100	11.76
1/24/2018	2:24:01 AM	35400	11.77
1/24/2018	2:29:01 AM	35700	11.76
1/24/2018	2:34:01 AM	36000	11.76
1/24/2018	2:39:01 AM	36300	11.76
1/24/2018	2:44:01 AM	36600	11.77
1/24/2018	2:49:01 AM	36900	11.77
1/24/2018	2:54:01 AM	37200	11.77
1/24/2018	2:59:01 AM	37500	11.77
1/24/2018	3:04:01 AM	37800	11.77
1/24/2018	3:09:01 AM	38100	11.76
1/24/2018	3:14:01 AM	38400	11.77
1/24/2018	3:19:01 AM	38700	11.77
1/24/2018	3:24:01 AM	39000	11.77
1/24/2018	3:29:01 AM	39300	11.77

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/24/2018	3:34:01 AM	39600	11.77
1/24/2018	3:39:01 AM	39900	11.77
1/24/2018	3:44:01 AM	40200	11.77
1/24/2018	3:49:01 AM	40500	11.77
1/24/2018	3:54:01 AM	40800	11.77
1/24/2018	3:59:01 AM	41100	11.77
1/24/2018	4:04:01 AM	41400	11.77
1/24/2018	4:09:01 AM	41700	11.77
1/24/2018	4:14:01 AM	42000	11.78
1/24/2018	4:19:01 AM	42300	11.77
1/24/2018	4:24:01 AM	42600	11.77
1/24/2018	4:29:01 AM	42900	11.78
1/24/2018	4:34:01 AM	43200	11.78
1/24/2018	4:39:01 AM	43500	11.78
1/24/2018	4:44:01 AM	43800	11.78
1/24/2018	4:49:01 AM	44100	11.78
1/24/2018	4:54:01 AM	44400	11.78
1/24/2018	4:59:01 AM	44700	11.77
1/24/2018	5:04:01 AM	45000	11.78
1/24/2018	5:09:01 AM	45300	11.77
1/24/2018	5:14:01 AM	45600	11.78
1/24/2018	5:19:01 AM	45900	11.78
1/24/2018	5:24:01 AM	46200	11.78
1/24/2018	5:29:01 AM	46500	11.77
1/24/2018	5:34:01 AM	46800	11.78
1/24/2018	5:39:01 AM	47100	11.78
1/24/2018	5:44:01 AM	47400	11.78
1/24/2018	5:49:01 AM	47700	11.78
1/24/2018	5:54:01 AM	48000	11.78
1/24/2018	5:59:01 AM	48300	11.78
1/24/2018	6:04:01 AM	48600	11.78
1/24/2018	6:09:01 AM	48900	11.78
1/24/2018	6:14:01 AM	49200	11.78
1/24/2018	6:19:01 AM	49500	11.78
1/24/2018	6:24:01 AM	49800	11.78
1/24/2018	6:29:01 AM	50100	11.78
1/24/2018	6:34:01 AM	50400	11.78
1/24/2018	6:39:01 AM	50700	11.79
1/24/2018	6:44:01 AM	51000	11.78
1/24/2018	6:49:01 AM	51300	11.79
1/24/2018	6:54:01 AM	51600	11.79
1/24/2018	6:59:01 AM	51900	11.78
1/24/2018	7:04:01 AM	52200	11.78
1/24/2018	7:09:01 AM	52500	11.79

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/24/2018	7:14:01 AM	52800	11.79
1/24/2018	7:19:01 AM	53100	11.79
1/24/2018	7:24:01 AM	53400	11.79
1/24/2018	7:29:01 AM	53700	11.79
1/24/2018	7:34:01 AM	54000	11.8
1/24/2018	7:39:01 AM	54300	11.8
1/24/2018	7:44:01 AM	54600	11.8
1/24/2018	7:49:01 AM	54900	11.8
1/24/2018	7:54:01 AM	55200	11.79
1/24/2018	7:59:01 AM	55500	11.79
1/24/2018	8:04:01 AM	55800	11.79
1/24/2018	8:09:01 AM	56100	11.8
1/24/2018	8:14:01 AM	56400	11.8
1/24/2018	8:19:01 AM	56700	11.8
1/24/2018	8:24:01 AM	57000	11.8
1/24/2018	8:29:01 AM	57300	11.8
1/24/2018	8:34:01 AM	57600	11.8
1/24/2018	8:39:01 AM	57900	11.8
1/24/2018	8:44:01 AM	58200	11.8
1/24/2018	8:49:01 AM	58500	11.8
1/24/2018	8:54:01 AM	58800	11.8
1/24/2018	8:59:01 AM	59100	11.81
1/24/2018	9:04:01 AM	59400	11.8
1/24/2018	9:09:01 AM	59700	11.81
1/24/2018	9:14:01 AM	60000	11.81
1/24/2018	9:19:01 AM	60300	11.81
1/24/2018	9:24:01 AM	60600	11.81
1/24/2018	9:29:01 AM	60900	11.8
1/24/2018	9:34:01 AM	61200	11.81
1/24/2018	9:39:01 AM	61500	11.81
1/24/2018	9:44:01 AM	61800	11.81
1/24/2018	9:49:01 AM	62100	11.81
1/24/2018	9:54:01 AM	62400	11.81
1/24/2018	9:59:01 AM	62700	11.81
1/24/2018	10:04:01 AM	63000	11.81
1/24/2018	10:09:01 AM	63300	11.82
1/24/2018	10:14:01 AM	63600	11.81
1/24/2018	10:19:01 AM	63900	11.81
1/24/2018	10:24:01 AM	64200	11.81
1/24/2018	10:29:01 AM	64500	11.8
1/24/2018	10:34:01 AM	64800	11.8
1/24/2018	10:39:01 AM	65100	11.81
1/24/2018	10:44:01 AM	65400	11.8
1/24/2018	10:49:01 AM	65700	11.79

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/24/2018	10:54:01 AM	66000	11.8
1/24/2018	10:59:01 AM	66300	11.8
1/24/2018	11:04:01 AM	66600	11.79
1/24/2018	11:09:01 AM	66900	11.79
1/24/2018	11:14:01 AM	67200	11.79
1/24/2018	11:19:01 AM	67500	11.79
1/24/2018	11:24:01 AM	67800	11.79
1/24/2018	11:29:01 AM	68100	11.79
1/24/2018	11:34:01 AM	68400	11.78
1/24/2018	11:39:01 AM	68700	11.79
1/24/2018	11:44:01 AM	69000	11.78
1/24/2018	11:49:01 AM	69300	11.78
1/24/2018	11:54:01 AM	69600	11.77
1/24/2018	11:59:01 AM	69900	11.78
1/24/2018	12:04:01 PM	70200	11.78
1/24/2018	12:09:01 PM	70500	11.78
1/24/2018	12:14:01 PM	70800	11.79
1/24/2018	12:19:01 PM	71100	11.76
1/24/2018	12:24:01 PM	71400	11.76
1/24/2018	12:29:01 PM	71700	11.77
1/24/2018	12:34:01 PM	72000	11.76
1/24/2018	12:39:01 PM	72300	11.76
1/24/2018	12:44:01 PM	72600	11.76
1/24/2018	12:49:01 PM	72900	11.75
1/24/2018	12:54:01 PM	73200	11.76
1/24/2018	12:59:01 PM	73500	11.75
1/24/2018	1:04:01 PM	73800	11.75
1/24/2018	1:09:01 PM	74100	11.75
1/24/2018	1:14:01 PM	74400	11.75
1/24/2018	1:19:01 PM	74700	11.75
1/24/2018	1:24:01 PM	75000	11.75
1/24/2018	1:29:01 PM	75300	11.75
1/24/2018	1:34:01 PM	75600	11.75
1/24/2018	1:39:01 PM	75900	11.74
1/24/2018	1:44:01 PM	76200	11.75
1/24/2018	1:49:01 PM	76500	11.75
1/24/2018	1:54:01 PM	76800	11.74
1/24/2018	1:59:01 PM	77100	11.74
1/24/2018	2:04:01 PM	77400	11.74
1/24/2018	2:09:01 PM	77700	11.74
1/24/2018	2:14:01 PM	78000	11.73
1/24/2018	2:19:01 PM	78300	11.73
1/24/2018	2:24:01 PM	78600	11.74
1/24/2018	2:29:01 PM	78900	11.73

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/24/2018	2:34:01 PM	79200	11.73
1/24/2018	2:39:01 PM	79500	11.73
1/24/2018	2:44:01 PM	79800	11.74
1/24/2018	2:49:01 PM	80100	11.73
1/24/2018	2:54:01 PM	80400	11.74
1/24/2018	2:59:01 PM	80700	11.73
1/24/2018	3:04:01 PM	81000	11.74
1/24/2018	3:09:01 PM	81300	11.74
1/24/2018	3:14:01 PM	81600	11.74
1/24/2018	3:19:01 PM	81900	11.74
1/24/2018	3:24:01 PM	82200	11.74
1/24/2018	3:29:01 PM	82500	11.73
1/24/2018	3:34:01 PM	82800	11.74
1/24/2018	3:39:01 PM	83100	11.74
1/24/2018	3:44:01 PM	83400	11.74
1/24/2018	3:49:01 PM	83700	11.75
1/24/2018	3:54:01 PM	84000	11.74
1/24/2018	3:59:01 PM	84300	11.74
1/24/2018	4:04:01 PM	84600	11.74
1/24/2018	4:09:01 PM	84900	11.74
1/24/2018	4:14:01 PM	85200	11.74
1/24/2018	4:19:01 PM	85500	11.74
1/24/2018	4:24:01 PM	85800	11.74
1/24/2018	4:29:01 PM	86100	11.73
1/24/2018	4:34:01 PM	86400	11.74
1/24/2018	4:39:01 PM	86700	11.74
1/24/2018	4:44:01 PM	87000	11.74
1/24/2018	4:49:01 PM	87300	11.75
1/24/2018	4:54:01 PM	87600	11.75
1/24/2018	4:59:01 PM	87900	11.74
1/24/2018	5:04:01 PM	88200	11.75
1/24/2018	5:09:01 PM	88500	11.74
1/24/2018	5:14:01 PM	88800	11.75
1/24/2018	5:19:01 PM	89100	11.75
1/24/2018	5:24:01 PM	89400	11.75
1/24/2018	5:29:01 PM	89700	11.75
1/24/2018	5:34:01 PM	90000	11.75
1/24/2018	5:39:01 PM	90300	11.75
1/24/2018	5:44:01 PM	90600	11.76
1/24/2018	5:49:01 PM	90900	11.75
1/24/2018	5:54:01 PM	91200	11.76
1/24/2018	5:59:01 PM	91500	11.75
1/24/2018	6:04:01 PM	91800	11.75
1/24/2018	6:09:01 PM	92100	11.76

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/24/2018	6:14:01 PM	92400	11.75
1/24/2018	6:19:01 PM	92700	11.76
1/24/2018	6:24:01 PM	93000	11.76
1/24/2018	6:29:01 PM	93300	11.76
1/24/2018	6:34:01 PM	93600	11.76
1/24/2018	6:39:01 PM	93900	11.76
1/24/2018	6:44:01 PM	94200	11.76
1/24/2018	6:49:01 PM	94500	11.76
1/24/2018	6:54:01 PM	94800	11.76
1/24/2018	6:59:01 PM	95100	11.76
1/24/2018	7:04:01 PM	95400	11.77
1/24/2018	7:09:01 PM	95700	11.76
1/24/2018	7:14:01 PM	96000	11.77
1/24/2018	7:19:01 PM	96300	11.77
1/24/2018	7:24:01 PM	96600	11.77
1/24/2018	7:29:01 PM	96900	11.77
1/24/2018	7:34:01 PM	97200	11.77
1/24/2018	7:39:01 PM	97500	11.76
1/24/2018	7:44:01 PM	97800	11.77
1/24/2018	7:49:01 PM	98100	11.77
1/24/2018	7:54:01 PM	98400	11.77
1/24/2018	7:59:01 PM	98700	11.76
1/24/2018	8:04:01 PM	99000	11.77
1/24/2018	8:09:01 PM	99300	11.77
1/24/2018	8:14:01 PM	99600	11.77
1/24/2018	8:19:01 PM	99900	11.77
1/24/2018	8:24:01 PM	100200	11.76
1/24/2018	8:29:01 PM	100500	11.77
1/24/2018	8:34:01 PM	100800	11.77
1/24/2018	8:39:01 PM	101100	11.76
1/24/2018	8:44:01 PM	101400	11.77
1/24/2018	8:49:01 PM	101700	11.77
1/24/2018	8:54:01 PM	102000	11.77
1/24/2018	8:59:01 PM	102300	11.77
1/24/2018	9:04:01 PM	102600	11.77
1/24/2018	9:09:01 PM	102900	11.77
1/24/2018	9:14:01 PM	103200	11.76
1/24/2018	9:19:01 PM	103500	11.77
1/24/2018	9:24:01 PM	103800	11.77
1/24/2018	9:29:01 PM	104100	11.77
1/24/2018	9:34:01 PM	104400	11.76
1/24/2018	9:39:01 PM	104700	11.77
1/24/2018	9:44:01 PM	105000	11.77
1/24/2018	9:49:01 PM	105300	11.77

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/24/2018	9:54:01 PM	105600	11.77
1/24/2018	9:59:01 PM	105900	11.77
1/24/2018	10:04:01 PM	106200	11.77
1/24/2018	10:09:01 PM	106500	11.77
1/24/2018	10:14:01 PM	106800	11.78
1/24/2018	10:19:01 PM	107100	11.77
1/24/2018	10:24:01 PM	107400	11.77
1/24/2018	10:29:01 PM	107700	11.77
1/24/2018	10:34:01 PM	108000	11.78
1/24/2018	10:39:01 PM	108300	11.77
1/24/2018	10:44:01 PM	108600	11.77
1/24/2018	10:49:01 PM	108900	11.77
1/24/2018	10:54:01 PM	109200	11.77
1/24/2018	10:59:01 PM	109500	11.78
1/24/2018	11:04:01 PM	109800	11.78
1/24/2018	11:09:01 PM	110100	11.77
1/24/2018	11:14:01 PM	110400	11.77
1/24/2018	11:19:01 PM	110700	11.78
1/24/2018	11:24:01 PM	111000	11.77
1/24/2018	11:29:01 PM	111300	11.77
1/24/2018	11:34:01 PM	111600	11.77
1/24/2018	11:39:01 PM	111900	11.77
1/24/2018	11:44:01 PM	112200	11.77
1/24/2018	11:49:01 PM	112500	11.78
1/24/2018	11:54:01 PM	112800	11.77
1/24/2018	11:59:01 PM	113100	11.77
1/25/2018	12:04:01 AM	113400	11.77
1/25/2018	12:09:01 AM	113700	11.77
1/25/2018	12:14:01 AM	114000	11.77
1/25/2018	12:19:01 AM	114300	11.77
1/25/2018	12:24:01 AM	114600	11.77
1/25/2018	12:29:01 AM	114900	11.77
1/25/2018	12:34:01 AM	115200	11.77
1/25/2018	12:39:01 AM	115500	11.77
1/25/2018	12:44:01 AM	115800	11.77
1/25/2018	12:49:01 AM	116100	11.77
1/25/2018	12:54:01 AM	116400	11.77
1/25/2018	12:59:01 AM	116700	11.77
1/25/2018	1:04:01 AM	117000	11.77
1/25/2018	1:09:01 AM	117300	11.77
1/25/2018	1:14:01 AM	117600	11.77
1/25/2018	1:19:01 AM	117900	11.77
1/25/2018	1:24:01 AM	118200	11.76
1/25/2018	1:29:01 AM	118500	11.77

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	1:34:01 AM	118800	11.77
1/25/2018	1:39:01 AM	119100	11.77
1/25/2018	1:44:01 AM	119400	11.76
1/25/2018	1:49:01 AM	119700	11.76
1/25/2018	1:54:01 AM	120000	11.76
1/25/2018	1:59:01 AM	120300	11.76
1/25/2018	2:04:01 AM	120600	11.77
1/25/2018	2:09:01 AM	120900	11.76
1/25/2018	2:14:01 AM	121200	11.77
1/25/2018	2:19:01 AM	121500	11.76
1/25/2018	2:24:01 AM	121800	11.76
1/25/2018	2:29:01 AM	122100	11.77
1/25/2018	2:34:01 AM	122400	11.77
1/25/2018	2:39:01 AM	122700	11.77
1/25/2018	2:44:01 AM	123000	11.77
1/25/2018	2:49:01 AM	123300	11.77
1/25/2018	2:54:01 AM	123600	11.76
1/25/2018	2:59:01 AM	123900	11.76
1/25/2018	3:04:01 AM	124200	11.77
1/25/2018	3:09:01 AM	124500	11.77
1/25/2018	3:14:01 AM	124800	11.77
1/25/2018	3:19:01 AM	125100	11.76
1/25/2018	3:24:01 AM	125400	11.76
1/25/2018	3:29:01 AM	125700	11.77
1/25/2018	3:34:01 AM	126000	11.77
1/25/2018	3:39:01 AM	126300	11.76
1/25/2018	3:44:01 AM	126600	11.76
1/25/2018	3:49:01 AM	126900	11.77
1/25/2018	3:54:01 AM	127200	11.77
1/25/2018	3:59:01 AM	127500	11.76
1/25/2018	4:04:01 AM	127800	11.77
1/25/2018	4:09:01 AM	128100	11.76
1/25/2018	4:14:01 AM	128400	11.76
1/25/2018	4:19:01 AM	128700	11.76
1/25/2018	4:24:01 AM	129000	11.77
1/25/2018	4:29:01 AM	129300	11.77
1/25/2018	4:34:01 AM	129600	11.76
1/25/2018	4:39:01 AM	129900	11.76
1/25/2018	4:44:01 AM	130200	11.76
1/25/2018	4:49:01 AM	130500	11.76
1/25/2018	4:54:01 AM	130800	11.77
1/25/2018	4:59:01 AM	131100	11.77
1/25/2018	5:04:01 AM	131400	11.77
1/25/2018	5:09:01 AM	131700	11.76

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	5:14:01 AM	132000	11.77
1/25/2018	5:19:01 AM	132300	11.77
1/25/2018	5:24:01 AM	132600	11.77
1/25/2018	5:29:01 AM	132900	11.77
1/25/2018	5:34:01 AM	133200	11.77
1/25/2018	5:39:01 AM	133500	11.77
1/25/2018	5:44:01 AM	133800	11.77
1/25/2018	5:49:01 AM	134100	11.78
1/25/2018	5:54:01 AM	134400	11.77
1/25/2018	5:59:01 AM	134700	11.77
1/25/2018	6:04:01 AM	135000	11.77
1/25/2018	6:09:01 AM	135300	11.78
1/25/2018	6:14:01 AM	135600	11.78
1/25/2018	6:19:01 AM	135900	11.78
1/25/2018	6:24:01 AM	136200	11.78
1/25/2018	6:29:01 AM	136500	11.78
1/25/2018	6:34:01 AM	136800	11.77
1/25/2018	6:39:01 AM	137100	11.78
1/25/2018	6:44:01 AM	137400	11.78
1/25/2018	6:49:01 AM	137700	11.78
1/25/2018	6:54:01 AM	138000	11.78
1/25/2018	6:59:01 AM	138300	11.78
1/25/2018	7:04:01 AM	138600	11.78
1/25/2018	7:09:01 AM	138900	11.78
1/25/2018	7:14:01 AM	139200	11.78
1/25/2018	7:19:01 AM	139500	11.78
1/25/2018	7:24:01 AM	139800	11.78
1/25/2018	7:29:01 AM	140100	11.79
1/25/2018	7:34:01 AM	140400	11.78
1/25/2018	7:39:01 AM	140700	11.79
1/25/2018	7:44:01 AM	141000	11.79
1/25/2018	7:49:01 AM	141300	11.79
1/25/2018	7:54:01 AM	141600	11.79
1/25/2018	7:59:01 AM	141900	11.79
1/25/2018	8:04:01 AM	142200	11.79
1/25/2018	8:09:01 AM	142500	11.79
1/25/2018	8:14:01 AM	142800	11.79
1/25/2018	8:19:01 AM	143100	11.79
1/25/2018	8:24:01 AM	143400	11.79
1/25/2018	8:29:01 AM	143700	11.79
1/25/2018	8:34:01 AM	144000	11.79
1/25/2018	8:39:01 AM	144300	11.79
1/25/2018	8:44:01 AM	144600	11.8
1/25/2018	8:49:01 AM	144900	11.8

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	8:54:01 AM	145200	11.79
1/25/2018	8:59:01 AM	145500	11.8
1/25/2018	9:04:01 AM	145800	11.8
1/25/2018	9:09:01 AM	146100	11.8
1/25/2018	9:14:01 AM	146400	11.79
1/25/2018	9:19:01 AM	146700	11.8
1/25/2018	9:24:01 AM	147000	11.8
1/25/2018	9:29:01 AM	147300	11.8
1/25/2018	9:34:01 AM	147600	11.8
1/25/2018	9:39:01 AM	147900	11.79
1/25/2018	9:44:01 AM	148200	11.81
1/25/2018	9:49:01 AM	148500	11.8
1/25/2018	9:54:01 AM	148800	11.8
1/25/2018	9:59:01 AM	149100	11.8
1/25/2018	10:04:01 AM	149400	11.8
1/25/2018	10:09:01 AM	149700	11.8
1/25/2018	10:14:01 AM	150000	11.8
1/25/2018	10:19:01 AM	150300	11.8
1/25/2018	10:24:01 AM	150600	11.8
1/25/2018	10:29:01 AM	150900	11.79
1/25/2018	10:34:01 AM	151200	11.8
1/25/2018	10:39:01 AM	151500	11.79
1/25/2018	10:44:01 AM	151800	11.78
1/25/2018	10:49:01 AM	152100	11.78
1/25/2018	10:54:01 AM	152400	11.79
1/25/2018	10:59:01 AM	152700	11.79
1/25/2018	11:04:01 AM	153000	11.78
1/25/2018	11:09:01 AM	153300	11.79
1/25/2018	11:14:01 AM	153600	11.79
1/25/2018	11:19:01 AM	153900	11.79
1/25/2018	11:24:01 AM	154200	11.78
1/25/2018	11:29:01 AM	154500	11.78
1/25/2018	11:34:01 AM	154800	11.78
1/25/2018	11:39:01 AM	155100	11.79
1/25/2018	11:44:01 AM	155400	11.76
1/25/2018	11:49:01 AM	155700	11.78
1/25/2018	11:54:01 AM	156000	11.77
1/25/2018	11:59:01 AM	156300	11.76
1/25/2018	12:04:01 PM	156600	11.76
1/25/2018	12:09:01 PM	156900	11.75
1/25/2018	12:14:01 PM	157200	11.75
1/25/2018	12:19:01 PM	157500	11.75
1/25/2018	12:24:01 PM	157800	11.76
1/25/2018	12:29:01 PM	158100	11.75

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	12:34:01 PM	158400	11.76
1/25/2018	12:39:01 PM	158700	11.75
1/25/2018	12:44:01 PM	159000	11.76
1/25/2018	12:49:01 PM	159300	11.75
1/25/2018	12:54:01 PM	159600	11.75
1/25/2018	12:59:01 PM	159900	11.76
1/25/2018	1:04:01 PM	160200	11.74
1/25/2018	1:09:01 PM	160500	11.73
1/25/2018	1:14:01 PM	160800	11.74
1/25/2018	1:19:01 PM	161100	11.74
1/25/2018	1:24:01 PM	161400	11.74
1/25/2018	1:29:01 PM	161700	11.73
1/25/2018	1:34:01 PM	162000	11.74
1/25/2018	1:39:01 PM	162300	11.73
1/25/2018	1:44:01 PM	162600	11.74
1/25/2018	1:49:01 PM	162900	11.73
1/25/2018	1:54:01 PM	163200	11.74
1/25/2018	1:59:01 PM	163500	11.73
1/25/2018	2:04:01 PM	163800	11.71
1/25/2018	2:09:01 PM	164100	11.73
1/25/2018	2:14:01 PM	164400	11.73
1/25/2018	2:19:01 PM	164700	11.73
1/25/2018	2:24:01 PM	165000	11.72
1/25/2018	2:29:01 PM	165300	11.73
1/25/2018	2:34:01 PM	165600	11.72
1/25/2018	2:39:01 PM	165900	11.71
1/25/2018	2:44:01 PM	166200	11.73
1/25/2018	2:49:01 PM	166500	11.73
1/25/2018	2:54:01 PM	166800	11.71
1/25/2018	2:59:01 PM	167100	11.72
1/25/2018	3:04:01 PM	167400	11.72
1/25/2018	3:09:01 PM	167700	11.72
1/25/2018	3:14:01 PM	168000	11.72
1/25/2018	3:19:01 PM	168300	11.72
1/25/2018	3:24:01 PM	168600	11.72
1/25/2018	3:29:01 PM	168900	11.71
1/25/2018	3:34:01 PM	169200	11.71
1/25/2018	3:39:01 PM	169500	11.71
1/25/2018	3:44:01 PM	169800	11.72
1/25/2018	3:49:01 PM	170100	11.72
1/25/2018	3:54:01 PM	170400	11.72
1/25/2018	3:59:01 PM	170700	11.71
1/25/2018	4:04:01 PM	171000	11.72
1/25/2018	4:09:01 PM	171300	11.71

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	4:14:01 PM	171600	11.72
1/25/2018	4:19:01 PM	171900	11.71
1/25/2018	4:24:01 PM	172200	12.35
1/25/2018	4:29:01 PM	172500	12.32
1/25/2018	4:34:01 PM	172800	12.25
1/25/2018	4:39:01 PM	173100	12.24
1/25/2018	4:44:01 PM	173400	12.24
1/25/2018	4:49:01 PM	173700	12.29
1/25/2018	4:54:01 PM	174000	12.28
1/25/2018	4:59:01 PM	174300	12.28
1/25/2018	5:04:01 PM	174600	12.29
1/25/2018	5:09:01 PM	174900	12.3
1/25/2018	5:14:01 PM	175200	12.29
1/25/2018	5:19:01 PM	175500	12.3
1/25/2018	5:24:01 PM	175800	12.3
1/25/2018	5:29:01 PM	176100	12.31
1/25/2018	5:34:01 PM	176400	12.31
1/25/2018	5:39:01 PM	176700	12.31
1/25/2018	5:44:01 PM	177000	12.31
1/25/2018	5:49:01 PM	177300	12.32
1/25/2018	5:54:01 PM	177600	12.32
1/25/2018	5:59:01 PM	177900	12.33
1/25/2018	6:04:01 PM	178200	12.32
1/25/2018	6:09:01 PM	178500	12.33
1/25/2018	6:14:01 PM	178800	12.32
1/25/2018	6:19:01 PM	179100	12.33
1/25/2018	6:24:01 PM	179400	12.34
1/25/2018	6:29:01 PM	179700	12.34
1/25/2018	6:34:01 PM	180000	12.34
1/25/2018	6:39:01 PM	180300	12.34
1/25/2018	6:44:01 PM	180600	12.34
1/25/2018	6:49:01 PM	180900	12.34
1/25/2018	6:54:01 PM	181200	12.35
1/25/2018	6:59:01 PM	181500	12.34
1/25/2018	7:04:01 PM	181800	12.35
1/25/2018	7:09:01 PM	182100	12.35
1/25/2018	7:14:01 PM	182400	12.35
1/25/2018	7:19:01 PM	182700	12.35
1/25/2018	7:24:01 PM	183000	12.35
1/25/2018	7:29:01 PM	183300	12.35
1/25/2018	7:34:01 PM	183600	12.35
1/25/2018	7:39:01 PM	183900	12.35
1/25/2018	7:44:01 PM	184200	12.36
1/25/2018	7:49:01 PM	184500	12.36

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	7:54:01 PM	184800	12.36
1/25/2018	7:59:01 PM	185100	12.36
1/25/2018	8:04:01 PM	185400	12.36
1/25/2018	8:09:01 PM	185700	12.36
1/25/2018	8:14:01 PM	186000	12.37
1/25/2018	8:19:01 PM	186300	12.32
1/25/2018	8:24:01 PM	186600	12.35
1/25/2018	8:29:01 PM	186900	12.36
1/25/2018	8:34:01 PM	187200	12.37
1/25/2018	8:39:01 PM	187500	12.37
1/25/2018	8:44:01 PM	187800	12.37
1/25/2018	8:49:01 PM	188100	12.37
1/25/2018	8:54:01 PM	188400	12.37
1/25/2018	8:59:01 PM	188700	12.37
1/25/2018	9:04:01 PM	189000	12.37
1/25/2018	9:09:01 PM	189300	12.38
1/25/2018	9:14:01 PM	189600	12.38
1/25/2018	9:19:01 PM	189900	12.37
1/25/2018	9:24:01 PM	190200	12.33
1/25/2018	9:29:01 PM	190500	12.33
1/25/2018	9:34:01 PM	190800	12.36
1/25/2018	9:39:01 PM	191100	12.37
1/25/2018	9:44:01 PM	191400	12.37
1/25/2018	9:49:01 PM	191700	12.37
1/25/2018	9:54:01 PM	192000	12.37
1/25/2018	9:59:01 PM	192300	12.38
1/25/2018	10:04:01 PM	192600	12.38
1/25/2018	10:09:01 PM	192900	12.38
1/25/2018	10:14:01 PM	193200	12.38
1/25/2018	10:19:01 PM	193500	12.38
1/25/2018	10:24:01 PM	193800	12.38
1/25/2018	10:29:01 PM	194100	12.38
1/25/2018	10:34:01 PM	194400	12.38
1/25/2018	10:39:01 PM	194700	12.38
1/25/2018	10:44:01 PM	195000	12.38
1/25/2018	10:49:01 PM	195300	12.39
1/25/2018	10:54:01 PM	195600	12.35
1/25/2018	10:59:01 PM	195900	12.34
1/25/2018	11:04:01 PM	196200	12.33
1/25/2018	11:09:01 PM	196500	12.33
1/25/2018	11:14:01 PM	196800	12.35
1/25/2018	11:19:01 PM	197100	12.38
1/25/2018	11:24:01 PM	197400	12.39
1/25/2018	11:29:01 PM	197700	12.38

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/25/2018	11:34:01 PM	198000	12.39
1/25/2018	11:39:01 PM	198300	12.39
1/25/2018	11:44:01 PM	198600	12.39
1/25/2018	11:49:01 PM	198900	12.39
1/25/2018	11:54:01 PM	199200	12.39
1/25/2018	11:59:01 PM	199500	12.39
1/26/2018	12:04:01 AM	199800	12.4
1/26/2018	12:09:01 AM	200100	12.4
1/26/2018	12:14:01 AM	200400	12.4
1/26/2018	12:19:01 AM	200700	12.39
1/26/2018	12:24:01 AM	201000	12.4
1/26/2018	12:29:01 AM	201300	12.4
1/26/2018	12:34:01 AM	201600	12.4
1/26/2018	12:39:01 AM	201900	12.41
1/26/2018	12:44:01 AM	202200	12.4
1/26/2018	12:49:01 AM	202500	12.4
1/26/2018	12:54:01 AM	202800	12.4
1/26/2018	12:59:01 AM	203100	12.4
1/26/2018	1:04:01 AM	203400	12.4
1/26/2018	1:09:01 AM	203700	12.4
1/26/2018	1:14:01 AM	204000	12.4
1/26/2018	1:19:01 AM	204300	12.4
1/26/2018	1:24:01 AM	204600	12.4
1/26/2018	1:29:01 AM	204900	12.4
1/26/2018	1:34:01 AM	205200	12.4
1/26/2018	1:39:01 AM	205500	12.4
1/26/2018	1:44:01 AM	205800	12.4
1/26/2018	1:49:01 AM	206100	12.4
1/26/2018	1:54:01 AM	206400	12.4
1/26/2018	1:59:01 AM	206700	12.39
1/26/2018	2:04:01 AM	207000	12.38
1/26/2018	2:09:01 AM	207300	12.35
1/26/2018	2:14:01 AM	207600	12.34
1/26/2018	2:19:01 AM	207900	12.34
1/26/2018	2:24:01 AM	208200	12.33
1/26/2018	2:29:01 AM	208500	12.33
1/26/2018	2:34:01 AM	208800	12.34
1/26/2018	2:39:01 AM	209100	12.33
1/26/2018	2:44:01 AM	209400	12.33
1/26/2018	2:49:01 AM	209700	12.34
1/26/2018	2:54:01 AM	210000	12.33
1/26/2018	2:59:01 AM	210300	12.33
1/26/2018	3:04:01 AM	210600	12.33
1/26/2018	3:09:01 AM	210900	12.33

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/26/2018	3:14:01 AM	211200	12.33
1/26/2018	3:19:01 AM	211500	12.33
1/26/2018	3:24:01 AM	211800	12.33
1/26/2018	3:29:01 AM	212100	12.34
1/26/2018	3:34:01 AM	212400	12.34
1/26/2018	3:39:01 AM	212700	12.34
1/26/2018	3:44:01 AM	213000	12.34
1/26/2018	3:49:01 AM	213300	12.34
1/26/2018	3:54:01 AM	213600	12.33
1/26/2018	3:59:01 AM	213900	12.33
1/26/2018	4:04:01 AM	214200	12.33
1/26/2018	4:09:01 AM	214500	12.34
1/26/2018	4:14:01 AM	214800	12.33
1/26/2018	4:19:01 AM	215100	12.33
1/26/2018	4:24:01 AM	215400	12.33
1/26/2018	4:29:01 AM	215700	12.34
1/26/2018	4:34:01 AM	216000	12.33
1/26/2018	4:39:01 AM	216300	12.33
1/26/2018	4:44:01 AM	216600	12.34
1/26/2018	4:49:01 AM	216900	12.33
1/26/2018	4:54:01 AM	217200	12.34
1/26/2018	4:59:01 AM	217500	12.33
1/26/2018	5:04:01 AM	217800	12.33
1/26/2018	5:09:01 AM	218100	12.34
1/26/2018	5:14:01 AM	218400	12.34
1/26/2018	5:19:01 AM	218700	12.34
1/26/2018	5:24:01 AM	219000	12.33
1/26/2018	5:29:01 AM	219300	12.34
1/26/2018	5:34:01 AM	219600	12.33
1/26/2018	5:39:01 AM	219900	12.34
1/26/2018	5:44:01 AM	220200	12.34
1/26/2018	5:49:01 AM	220500	12.35
1/26/2018	5:54:01 AM	220800	12.35
1/26/2018	5:59:01 AM	221100	12.35
1/26/2018	6:04:01 AM	221400	12.35
1/26/2018	6:09:01 AM	221700	12.34
1/26/2018	6:14:01 AM	222000	12.35
1/26/2018	6:19:01 AM	222300	12.34
1/26/2018	6:24:01 AM	222600	12.35
1/26/2018	6:29:01 AM	222900	12.35
1/26/2018	6:34:01 AM	223200	12.35
1/26/2018	6:39:01 AM	223500	12.35
1/26/2018	6:44:01 AM	223800	12.35
1/26/2018	6:49:01 AM	224100	12.35

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/26/2018	6:54:01 AM	224400	12.35
1/26/2018	6:59:01 AM	224700	12.35
1/26/2018	7:04:01 AM	225000	12.35
1/26/2018	7:09:01 AM	225300	12.35
1/26/2018	7:14:01 AM	225600	12.36
1/26/2018	7:19:01 AM	225900	12.37
1/26/2018	7:24:01 AM	226200	12.37
1/26/2018	7:29:01 AM	226500	12.37
1/26/2018	7:34:01 AM	226800	12.37
1/26/2018	7:39:01 AM	227100	12.37
1/26/2018	7:44:01 AM	227400	12.36
1/26/2018	7:49:01 AM	227700	12.36
1/26/2018	7:54:01 AM	228000	12.37
1/26/2018	7:59:01 AM	228300	12.37
1/26/2018	8:04:01 AM	228600	12.37
1/26/2018	8:09:01 AM	228900	12.37
1/26/2018	8:14:01 AM	229200	12.37
1/26/2018	8:19:01 AM	229500	12.37
1/26/2018	8:24:01 AM	229800	12.38
1/26/2018	8:29:01 AM	230100	12.38
1/26/2018	8:34:01 AM	230400	12.38
1/26/2018	8:39:01 AM	230700	12.44
1/26/2018	8:44:01 AM	231000	12.69
1/26/2018	8:49:01 AM	231300	13.17
1/26/2018	8:54:01 AM	231600	13.51
1/26/2018	8:59:01 AM	231900	13.65
1/26/2018	9:04:01 AM	232200	13.84
1/26/2018	9:09:01 AM	232500	13.89
1/26/2018	9:14:01 AM	232800	13.87
1/26/2018	9:19:01 AM	233100	13.9
1/26/2018	9:24:01 AM	233400	13.94
1/26/2018	9:29:01 AM	233700	13.93
1/26/2018	9:34:01 AM	234000	13.95
1/26/2018	9:39:01 AM	234300	13.95
1/26/2018	9:44:01 AM	234600	13.97
1/26/2018	9:49:01 AM	234900	13.98
1/26/2018	9:54:01 AM	235200	13.99
1/26/2018	9:59:01 AM	235500	14
1/26/2018	10:04:01 AM	235800	14.02
1/26/2018	10:09:01 AM	236100	14.02
1/26/2018	10:14:01 AM	236400	14.04
1/26/2018	10:19:01 AM	236700	14.04
1/26/2018	10:24:01 AM	237000	14.06
1/26/2018	10:29:01 AM	237300	14.07

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/26/2018	10:34:01 AM	237600	14.07
1/26/2018	10:39:01 AM	237900	14.09
1/26/2018	10:44:01 AM	238200	14.09
1/26/2018	10:49:01 AM	238500	14.1
1/26/2018	10:54:01 AM	238800	14.1
1/26/2018	10:59:01 AM	239100	14.11
1/26/2018	11:04:01 AM	239400	14.12
1/26/2018	11:09:01 AM	239700	14.12
1/26/2018	11:14:01 AM	240000	14.12
1/26/2018	11:19:01 AM	240300	14.13
1/26/2018	11:24:01 AM	240600	14.14
1/26/2018	11:29:01 AM	240900	14.15
1/26/2018	11:34:01 AM	241200	14.15
1/26/2018	11:39:01 AM	241500	14.15
1/26/2018	11:44:01 AM	241800	14.16
1/26/2018	11:49:01 AM	242100	14.18
1/26/2018	11:54:01 AM	242400	14.18
1/26/2018	11:59:01 AM	242700	14.18
1/26/2018	12:04:01 PM	243000	14.17
1/26/2018	12:09:01 PM	243300	14.18
1/26/2018	12:14:01 PM	243600	14.19
1/26/2018	12:19:01 PM	243900	14.19
1/26/2018	12:24:01 PM	244200	14.21
1/26/2018	12:29:01 PM	244500	14.2
1/26/2018	12:34:01 PM	244800	14.21
1/26/2018	12:39:01 PM	245100	14.2
1/26/2018	12:44:01 PM	245400	14.21
1/26/2018	12:49:01 PM	245700	14.22
1/26/2018	12:54:01 PM	246000	14.22
1/26/2018	12:59:01 PM	246300	14.22
1/26/2018	1:04:01 PM	246600	14.22
1/26/2018	1:09:01 PM	246900	14.23
1/26/2018	1:14:01 PM	247200	14.23
1/26/2018	1:19:01 PM	247500	14.24
1/26/2018	1:24:01 PM	247800	14.24
1/26/2018	1:29:01 PM	248100	14.24
1/26/2018	1:34:01 PM	248400	14.24
1/26/2018	1:39:01 PM	248700	14.24
1/26/2018	1:44:01 PM	249000	14.31
1/26/2018	1:49:01 PM	249300	14.56
1/26/2018	1:54:01 PM	249600	15.16
1/26/2018	1:59:01 PM	249900	15.34
1/26/2018	2:04:01 PM	250200	15.42
1/26/2018	2:09:01 PM	250500	15.46

17WW06 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/26/2018	2:14:01 PM	250800	15.49
1/26/2018	2:19:01 PM	251100	15.52
1/26/2018	2:24:01 PM	251400	15.54
1/26/2018	2:29:01 PM	251700	15.55
1/26/2018	2:34:01 PM	252000	15.57
1/26/2018	2:39:01 PM	252300	15.59
1/26/2018	2:44:01 PM	252600	15.61
1/26/2018	2:49:01 PM	252900	15.62
1/26/2018	2:54:01 PM	253200	15.63
1/26/2018	2:59:01 PM	253500	15.64
1/26/2018	3:04:01 PM	253800	15.66
1/26/2018	3:09:01 PM	254100	15.67
1/26/2018	3:14:01 PM	254400	15.68
1/26/2018	3:19:01 PM	254700	15.69
1/26/2018	3:24:01 PM	255000	15.71
1/26/2018	3:29:01 PM	255300	15.72
1/26/2018	3:34:01 PM	255600	15.73
1/26/2018	3:39:01 PM	255900	15.73
1/26/2018	3:44:01 PM	256200	15.74
1/26/2018	3:49:01 PM	256500	15.71
1/26/2018	3:54:01 PM	256800	15.71
1/26/2018	3:59:01 PM	257100	15.71
1/26/2018	4:04:01 PM	257400	15.72
1/26/2018	4:09:01 PM	257700	15.72
1/26/2018	4:14:01 PM	258000	15.74
1/26/2018	4:19:01 PM	258300	15.73
1/26/2018	4:24:01 PM	258600	15.74
1/26/2018	4:29:01 PM	258900	15.75
1/26/2018	4:34:01 PM	259200	15.76
1/26/2018	4:39:01 PM	259500	15.76
1/26/2018	4:44:01 PM	259800	15.77
1/26/2018	4:49:01 PM	260100	15.78
1/26/2018	4:54:01 PM	260400	15.78
1/26/2018	4:59:01 PM	260700	15.78
1/26/2018	5:03:04 PM	260943	15.79

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/23/2018	4:34:01 PM	0	8.76
1/23/2018	4:39:01 PM	300	8.76
1/23/2018	4:44:01 PM	600	8.76
1/23/2018	4:49:01 PM	900	8.76
1/23/2018	4:54:01 PM	1200	8.77
1/23/2018	4:59:01 PM	1500	8.76
1/23/2018	5:04:01 PM	1800	8.77
1/23/2018	5:09:01 PM	2100	8.76
1/23/2018	5:14:01 PM	2400	8.77
1/23/2018	5:19:01 PM	2700	8.76
1/23/2018	5:24:01 PM	3000	8.77
1/23/2018	5:29:01 PM	3300	8.77
1/23/2018	5:34:01 PM	3600	8.76
1/23/2018	5:39:01 PM	3900	8.77
1/23/2018	5:44:01 PM	4200	8.77
1/23/2018	5:49:01 PM	4500	8.77
1/23/2018	5:54:01 PM	4800	8.77
1/23/2018	5:59:01 PM	5100	8.78
1/23/2018	6:04:01 PM	5400	8.78
1/23/2018	6:09:01 PM	5700	8.78
1/23/2018	6:14:01 PM	6000	8.78
1/23/2018	6:19:01 PM	6300	8.79
1/23/2018	6:24:01 PM	6600	8.79
1/23/2018	6:29:01 PM	6900	8.79
1/23/2018	6:34:01 PM	7200	8.79
1/23/2018	6:39:01 PM	7500	8.79
1/23/2018	6:44:01 PM	7800	8.8
1/23/2018	6:49:01 PM	8100	8.79
1/23/2018	6:54:01 PM	8400	8.8
1/23/2018	6:59:01 PM	8700	8.8
1/23/2018	7:04:01 PM	9000	8.8
1/23/2018	7:09:01 PM	9300	8.81
1/23/2018	7:14:01 PM	9600	8.8
1/23/2018	7:19:01 PM	9900	8.81
1/23/2018	7:24:01 PM	10200	8.81
1/23/2018	7:29:01 PM	10500	8.81
1/23/2018	7:34:01 PM	10800	8.81
1/23/2018	7:39:01 PM	11100	8.81
1/23/2018	7:44:01 PM	11400	8.81
1/23/2018	7:49:01 PM	11700	8.81
1/23/2018	7:54:01 PM	12000	8.82
1/23/2018	7:59:01 PM	12300	8.81
1/23/2018	8:04:01 PM	12600	8.81
1/23/2018	8:09:01 PM	12900	8.82

130 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	130
1/23/2018	8:14:01 PM	13200	8.82
1/23/2018	8:19:01 PM	13500	8.82
1/23/2018	8:24:01 PM	13800	8.82
1/23/2018	8:29:01 PM	14100	8.82
1/23/2018	8:34:01 PM	14400	8.82
1/23/2018	8:39:01 PM	14700	8.82
1/23/2018	8:44:01 PM	15000	8.82
1/23/2018	8:49:01 PM	15300	8.83
1/23/2018	8:54:01 PM	15600	8.82
1/23/2018	8:59:01 PM	15900	8.82
1/23/2018	9:04:01 PM	16200	8.83
1/23/2018	9:09:01 PM	16500	8.83
1/23/2018	9:14:01 PM	16800	8.83
1/23/2018	9:19:01 PM	17100	8.82
1/23/2018	9:24:01 PM	17400	8.83
1/23/2018	9:29:01 PM	17700	8.83
1/23/2018	9:34:01 PM	18000	8.83
1/23/2018	9:39:01 PM	18300	8.83
1/23/2018	9:44:01 PM	18600	8.83
1/23/2018	9:49:01 PM	18900	8.83
1/23/2018	9:54:01 PM	19200	8.83
1/23/2018	9:59:01 PM	19500	8.83
1/23/2018	10:04:01 PM	19800	8.83
1/23/2018	10:09:01 PM	20100	8.83
1/23/2018	10:14:01 PM	20400	8.82
1/23/2018	10:19:01 PM	20700	8.82
1/23/2018	10:24:01 PM	21000	8.82
1/23/2018	10:29:01 PM	21300	8.82
1/23/2018	10:34:01 PM	21600	8.83
1/23/2018	10:39:01 PM	21900	8.82
1/23/2018	10:44:01 PM	22200	8.83
1/23/2018	10:49:01 PM	22500	8.83
1/23/2018	10:54:01 PM	22800	8.82
1/23/2018	10:59:01 PM	23100	8.82
1/23/2018	11:04:01 PM	23400	8.83
1/23/2018	11:09:01 PM	23700	8.82
1/23/2018	11:14:01 PM	24000	8.83
1/23/2018	11:19:01 PM	24300	8.83
1/23/2018	11:24:01 PM	24600	8.83
1/23/2018	11:29:01 PM	24900	8.83
1/23/2018	11:34:01 PM	25200	8.83
1/23/2018	11:39:01 PM	25500	8.83
1/23/2018	11:44:01 PM	25800	8.83
1/23/2018	11:49:01 PM	26100	8.83

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/23/2018	11:54:01 PM	26400	8.83
1/23/2018	11:59:01 PM	26700	8.83
1/24/2018	12:04:01 AM	27000	8.82
1/24/2018	12:09:01 AM	27300	8.82
1/24/2018	12:14:01 AM	27600	8.82
1/24/2018	12:19:01 AM	27900	8.83
1/24/2018	12:24:01 AM	28200	8.83
1/24/2018	12:29:01 AM	28500	8.83
1/24/2018	12:34:01 AM	28800	8.83
1/24/2018	12:39:01 AM	29100	8.83
1/24/2018	12:44:01 AM	29400	8.83
1/24/2018	12:49:01 AM	29700	8.83
1/24/2018	12:54:01 AM	30000	8.83
1/24/2018	12:59:01 AM	30300	8.83
1/24/2018	1:04:01 AM	30600	8.84
1/24/2018	1:09:01 AM	30900	8.83
1/24/2018	1:14:01 AM	31200	8.83
1/24/2018	1:19:01 AM	31500	8.84
1/24/2018	1:24:01 AM	31800	8.84
1/24/2018	1:29:01 AM	32100	8.84
1/24/2018	1:34:01 AM	32400	8.84
1/24/2018	1:39:01 AM	32700	8.84
1/24/2018	1:44:01 AM	33000	8.84
1/24/2018	1:49:01 AM	33300	8.83
1/24/2018	1:54:01 AM	33600	8.84
1/24/2018	1:59:01 AM	33900	8.83
1/24/2018	2:04:01 AM	34200	8.84
1/24/2018	2:09:01 AM	34500	8.84
1/24/2018	2:14:01 AM	34800	8.84
1/24/2018	2:19:01 AM	35100	8.84
1/24/2018	2:24:01 AM	35400	8.85
1/24/2018	2:29:01 AM	35700	8.84
1/24/2018	2:34:01 AM	36000	8.85
1/24/2018	2:39:01 AM	36300	8.85
1/24/2018	2:44:01 AM	36600	8.85
1/24/2018	2:49:01 AM	36900	8.85
1/24/2018	2:54:01 AM	37200	8.85
1/24/2018	2:59:01 AM	37500	8.85
1/24/2018	3:04:01 AM	37800	8.85
1/24/2018	3:09:01 AM	38100	8.85
1/24/2018	3:14:01 AM	38400	8.85
1/24/2018	3:19:01 AM	38700	8.85
1/24/2018	3:24:01 AM	39000	8.86
1/24/2018	3:29:01 AM	39300	8.86

130 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	130
1/24/2018	3:34:01 AM	39600	8.86
1/24/2018	3:39:01 AM	39900	8.86
1/24/2018	3:44:01 AM	40200	8.86
1/24/2018	3:49:01 AM	40500	8.86
1/24/2018	3:54:01 AM	40800	8.86
1/24/2018	3:59:01 AM	41100	8.86
1/24/2018	4:04:01 AM	41400	8.86
1/24/2018	4:09:01 AM	41700	8.86
1/24/2018	4:14:01 AM	42000	8.86
1/24/2018	4:19:01 AM	42300	8.87
1/24/2018	4:24:01 AM	42600	8.86
1/24/2018	4:29:01 AM	42900	8.86
1/24/2018	4:34:01 AM	43200	8.87
1/24/2018	4:39:01 AM	43500	8.87
1/24/2018	4:44:01 AM	43800	8.87
1/24/2018	4:49:01 AM	44100	8.87
1/24/2018	4:54:01 AM	44400	8.87
1/24/2018	4:59:01 AM	44700	8.86
1/24/2018	5:04:01 AM	45000	8.86
1/24/2018	5:09:01 AM	45300	8.87
1/24/2018	5:14:01 AM	45600	8.87
1/24/2018	5:19:01 AM	45900	8.86
1/24/2018	5:24:01 AM	46200	8.87
1/24/2018	5:29:01 AM	46500	8.86
1/24/2018	5:34:01 AM	46800	8.86
1/24/2018	5:39:01 AM	47100	8.87
1/24/2018	5:44:01 AM	47400	8.87
1/24/2018	5:49:01 AM	47700	8.87
1/24/2018	5:54:01 AM	48000	8.87
1/24/2018	5:59:01 AM	48300	8.87
1/24/2018	6:04:01 AM	48600	8.87
1/24/2018	6:09:01 AM	48900	8.87
1/24/2018	6:14:01 AM	49200	8.87
1/24/2018	6:19:01 AM	49500	8.87
1/24/2018	6:24:01 AM	49800	8.87
1/24/2018	6:29:01 AM	50100	8.87
1/24/2018	6:34:01 AM	50400	8.88
1/24/2018	6:39:01 AM	50700	8.87
1/24/2018	6:44:01 AM	51000	8.88
1/24/2018	6:49:01 AM	51300	8.88
1/24/2018	6:54:01 AM	51600	8.88
1/24/2018	6:59:01 AM	51900	8.88
1/24/2018	7:04:01 AM	52200	8.88
1/24/2018	7:09:01 AM	52500	8.88

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/24/2018	7:14:01 AM	52800	8.88
1/24/2018	7:19:01 AM	53100	8.89
1/24/2018	7:24:01 AM	53400	8.89
1/24/2018	7:29:01 AM	53700	8.89
1/24/2018	7:34:01 AM	54000	8.89
1/24/2018	7:39:01 AM	54300	8.89
1/24/2018	7:44:01 AM	54600	8.89
1/24/2018	7:49:01 AM	54900	8.89
1/24/2018	7:54:01 AM	55200	8.89
1/24/2018	7:59:01 AM	55500	8.89
1/24/2018	8:04:01 AM	55800	8.89
1/24/2018	8:09:01 AM	56100	8.89
1/24/2018	8:14:01 AM	56400	8.89
1/24/2018	8:19:01 AM	56700	8.89
1/24/2018	8:24:01 AM	57000	8.9
1/24/2018	8:29:01 AM	57300	8.9
1/24/2018	8:34:01 AM	57600	8.9
1/24/2018	8:39:01 AM	57900	8.9
1/24/2018	8:44:01 AM	58200	8.9
1/24/2018	8:49:01 AM	58500	8.9
1/24/2018	8:54:01 AM	58800	8.91
1/24/2018	8:59:01 AM	59100	8.9
1/24/2018	9:04:01 AM	59400	8.91
1/24/2018	9:09:01 AM	59700	8.91
1/24/2018	9:14:01 AM	60000	8.91
1/24/2018	9:19:01 AM	60300	8.91
1/24/2018	9:24:01 AM	60600	8.91
1/24/2018	9:29:01 AM	60900	8.91
1/24/2018	9:34:01 AM	61200	8.91
1/24/2018	9:39:01 AM	61500	8.91
1/24/2018	9:44:01 AM	61800	8.91
1/24/2018	9:49:01 AM	62100	8.91
1/24/2018	9:54:01 AM	62400	8.91
1/24/2018	9:59:01 AM	62700	8.91
1/24/2018	10:04:01 AM	63000	8.91
1/24/2018	10:09:01 AM	63300	8.91
1/24/2018	10:14:01 AM	63600	8.91
1/24/2018	10:19:01 AM	63900	8.91
1/24/2018	10:24:01 AM	64200	8.91
1/24/2018	10:29:01 AM	64500	8.9
1/24/2018	10:34:01 AM	64800	8.91
1/24/2018	10:39:01 AM	65100	8.91
1/24/2018	10:44:01 AM	65400	8.91
1/24/2018	10:49:01 AM	65700	8.92

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/24/2018	10:54:01 AM	66000	8.91
1/24/2018	10:59:01 AM	66300	8.91
1/24/2018	11:04:01 AM	66600	8.91
1/24/2018	11:09:01 AM	66900	8.9
1/24/2018	11:14:01 AM	67200	8.89
1/24/2018	11:19:01 AM	67500	8.9
1/24/2018	11:24:01 AM	67800	8.9
1/24/2018	11:29:01 AM	68100	8.89
1/24/2018	11:34:01 AM	68400	8.9
1/24/2018	11:39:01 AM	68700	8.88
1/24/2018	11:44:01 AM	69000	8.88
1/24/2018	11:49:01 AM	69300	8.88
1/24/2018	11:54:01 AM	69600	8.88
1/24/2018	11:59:01 AM	69900	8.88
1/24/2018	12:04:01 PM	70200	8.89
1/24/2018	12:09:01 PM	70500	8.87
1/24/2018	12:14:01 PM	70800	8.89
1/24/2018	12:19:01 PM	71100	8.88
1/24/2018	12:24:01 PM	71400	8.87
1/24/2018	12:29:01 PM	71700	8.89
1/24/2018	12:34:01 PM	72000	8.88
1/24/2018	12:39:01 PM	72300	8.88
1/24/2018	12:44:01 PM	72600	8.87
1/24/2018	12:49:01 PM	72900	8.86
1/24/2018	12:54:01 PM	73200	8.86
1/24/2018	12:59:01 PM	73500	8.86
1/24/2018	1:04:01 PM	73800	8.87
1/24/2018	1:09:01 PM	74100	8.86
1/24/2018	1:14:01 PM	74400	8.86
1/24/2018	1:19:01 PM	74700	8.85
1/24/2018	1:24:01 PM	75000	8.87
1/24/2018	1:29:01 PM	75300	8.85
1/24/2018	1:34:01 PM	75600	8.86
1/24/2018	1:39:01 PM	75900	8.85
1/24/2018	1:44:01 PM	76200	8.86
1/24/2018	1:49:01 PM	76500	8.86
1/24/2018	1:54:01 PM	76800	8.84
1/24/2018	1:59:01 PM	77100	8.84
1/24/2018	2:04:01 PM	77400	8.85
1/24/2018	2:09:01 PM	77700	8.85
1/24/2018	2:14:01 PM	78000	8.84
1/24/2018	2:19:01 PM	78300	8.84
1/24/2018	2:24:01 PM	78600	8.84
1/24/2018	2:29:01 PM	78900	8.84

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/24/2018	2:34:01 PM	79200	8.84
1/24/2018	2:39:01 PM	79500	8.84
1/24/2018	2:44:01 PM	79800	8.84
1/24/2018	2:49:01 PM	80100	8.84
1/24/2018	2:54:01 PM	80400	8.84
1/24/2018	2:59:01 PM	80700	8.84
1/24/2018	3:04:01 PM	81000	8.84
1/24/2018	3:09:01 PM	81300	8.83
1/24/2018	3:14:01 PM	81600	8.84
1/24/2018	3:19:01 PM	81900	8.84
1/24/2018	3:24:01 PM	82200	8.84
1/24/2018	3:29:01 PM	82500	8.84
1/24/2018	3:34:01 PM	82800	8.84
1/24/2018	3:39:01 PM	83100	8.85
1/24/2018	3:44:01 PM	83400	8.84
1/24/2018	3:49:01 PM	83700	8.85
1/24/2018	3:54:01 PM	84000	8.85
1/24/2018	3:59:01 PM	84300	8.84
1/24/2018	4:04:01 PM	84600	8.84
1/24/2018	4:09:01 PM	84900	8.84
1/24/2018	4:14:01 PM	85200	8.84
1/24/2018	4:19:01 PM	85500	8.84
1/24/2018	4:24:01 PM	85800	8.84
1/24/2018	4:29:01 PM	86100	8.84
1/24/2018	4:34:01 PM	86400	8.84
1/24/2018	4:39:01 PM	86700	8.84
1/24/2018	4:44:01 PM	87000	8.85
1/24/2018	4:49:01 PM	87300	8.84
1/24/2018	4:54:01 PM	87600	8.84
1/24/2018	4:59:01 PM	87900	8.85
1/24/2018	5:04:01 PM	88200	8.85
1/24/2018	5:09:01 PM	88500	8.84
1/24/2018	5:14:01 PM	88800	8.84
1/24/2018	5:19:01 PM	89100	8.85
1/24/2018	5:24:01 PM	89400	8.85
1/24/2018	5:29:01 PM	89700	8.85
1/24/2018	5:34:01 PM	90000	8.85
1/24/2018	5:39:01 PM	90300	8.85
1/24/2018	5:44:01 PM	90600	8.85
1/24/2018	5:49:01 PM	90900	8.85
1/24/2018	5:54:01 PM	91200	8.85
1/24/2018	5:59:01 PM	91500	8.85
1/24/2018	6:04:01 PM	91800	8.85
1/24/2018	6:09:01 PM	92100	8.85

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/24/2018	6:14:01 PM	92400	8.86
1/24/2018	6:19:01 PM	92700	8.85
1/24/2018	6:24:01 PM	93000	8.86
1/24/2018	6:29:01 PM	93300	8.86
1/24/2018	6:34:01 PM	93600	8.86
1/24/2018	6:39:01 PM	93900	8.86
1/24/2018	6:44:01 PM	94200	8.86
1/24/2018	6:49:01 PM	94500	8.87
1/24/2018	6:54:01 PM	94800	8.86
1/24/2018	6:59:01 PM	95100	8.86
1/24/2018	7:04:01 PM	95400	8.86
1/24/2018	7:09:01 PM	95700	8.86
1/24/2018	7:14:01 PM	96000	8.87
1/24/2018	7:19:01 PM	96300	8.86
1/24/2018	7:24:01 PM	96600	8.87
1/24/2018	7:29:01 PM	96900	8.87
1/24/2018	7:34:01 PM	97200	8.87
1/24/2018	7:39:01 PM	97500	8.87
1/24/2018	7:44:01 PM	97800	8.87
1/24/2018	7:49:01 PM	98100	8.87
1/24/2018	7:54:01 PM	98400	8.88
1/24/2018	7:59:01 PM	98700	8.87
1/24/2018	8:04:01 PM	99000	8.88
1/24/2018	8:09:01 PM	99300	8.87
1/24/2018	8:14:01 PM	99600	8.87
1/24/2018	8:19:01 PM	99900	8.88
1/24/2018	8:24:01 PM	100200	8.87
1/24/2018	8:29:01 PM	100500	8.87
1/24/2018	8:34:01 PM	100800	8.87
1/24/2018	8:39:01 PM	101100	8.87
1/24/2018	8:44:01 PM	101400	8.87
1/24/2018	8:49:01 PM	101700	8.87
1/24/2018	8:54:01 PM	102000	8.88
1/24/2018	8:59:01 PM	102300	8.87
1/24/2018	9:04:01 PM	102600	8.88
1/24/2018	9:09:01 PM	102900	8.88
1/24/2018	9:14:01 PM	103200	8.87
1/24/2018	9:19:01 PM	103500	8.87
1/24/2018	9:24:01 PM	103800	8.88
1/24/2018	9:29:01 PM	104100	8.88
1/24/2018	9:34:01 PM	104400	8.87
1/24/2018	9:39:01 PM	104700	8.87
1/24/2018	9:44:01 PM	105000	8.87
1/24/2018	9:49:01 PM	105300	8.88

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/24/2018	9:54:01 PM	105600	8.88
1/24/2018	9:59:01 PM	105900	8.88
1/24/2018	10:04:01 PM	106200	8.88
1/24/2018	10:09:01 PM	106500	8.88
1/24/2018	10:14:01 PM	106800	8.88
1/24/2018	10:19:01 PM	107100	8.88
1/24/2018	10:24:01 PM	107400	8.88
1/24/2018	10:29:01 PM	107700	8.88
1/24/2018	10:34:01 PM	108000	8.88
1/24/2018	10:39:01 PM	108300	8.88
1/24/2018	10:44:01 PM	108600	8.88
1/24/2018	10:49:01 PM	108900	8.88
1/24/2018	10:54:01 PM	109200	8.89
1/24/2018	10:59:01 PM	109500	8.89
1/24/2018	11:04:01 PM	109800	8.88
1/24/2018	11:09:01 PM	110100	8.88
1/24/2018	11:14:01 PM	110400	8.89
1/24/2018	11:19:01 PM	110700	8.88
1/24/2018	11:24:01 PM	111000	8.88
1/24/2018	11:29:01 PM	111300	8.88
1/24/2018	11:34:01 PM	111600	8.88
1/24/2018	11:39:01 PM	111900	8.89
1/24/2018	11:44:01 PM	112200	8.88
1/24/2018	11:49:01 PM	112500	8.88
1/24/2018	11:54:01 PM	112800	8.89
1/24/2018	11:59:01 PM	113100	8.88
1/25/2018	12:04:01 AM	113400	8.89
1/25/2018	12:09:01 AM	113700	8.89
1/25/2018	12:14:01 AM	114000	8.88
1/25/2018	12:19:01 AM	114300	8.88
1/25/2018	12:24:01 AM	114600	8.88
1/25/2018	12:29:01 AM	114900	8.88
1/25/2018	12:34:01 AM	115200	8.88
1/25/2018	12:39:01 AM	115500	8.88
1/25/2018	12:44:01 AM	115800	8.88
1/25/2018	12:49:01 AM	116100	8.88
1/25/2018	12:54:01 AM	116400	8.88
1/25/2018	12:59:01 AM	116700	8.88
1/25/2018	1:04:01 AM	117000	8.88
1/25/2018	1:09:01 AM	117300	8.89
1/25/2018	1:14:01 AM	117600	8.88
1/25/2018	1:19:01 AM	117900	8.88
1/25/2018	1:24:01 AM	118200	8.88
1/25/2018	1:29:01 AM	118500	8.88

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	1:34:01 AM	118800	8.88
1/25/2018	1:39:01 AM	119100	8.88
1/25/2018	1:44:01 AM	119400	8.89
1/25/2018	1:49:01 AM	119700	8.88
1/25/2018	1:54:01 AM	120000	8.89
1/25/2018	1:59:01 AM	120300	8.88
1/25/2018	2:04:01 AM	120600	8.88
1/25/2018	2:09:01 AM	120900	8.88
1/25/2018	2:14:01 AM	121200	8.88
1/25/2018	2:19:01 AM	121500	8.88
1/25/2018	2:24:01 AM	121800	8.88
1/25/2018	2:29:01 AM	122100	8.88
1/25/2018	2:34:01 AM	122400	8.88
1/25/2018	2:39:01 AM	122700	8.88
1/25/2018	2:44:01 AM	123000	8.87
1/25/2018	2:49:01 AM	123300	8.88
1/25/2018	2:54:01 AM	123600	8.88
1/25/2018	2:59:01 AM	123900	8.88
1/25/2018	3:04:01 AM	124200	8.88
1/25/2018	3:09:01 AM	124500	8.88
1/25/2018	3:14:01 AM	124800	8.88
1/25/2018	3:19:01 AM	125100	8.88
1/25/2018	3:24:01 AM	125400	8.88
1/25/2018	3:29:01 AM	125700	8.88
1/25/2018	3:34:01 AM	126000	8.88
1/25/2018	3:39:01 AM	126300	8.88
1/25/2018	3:44:01 AM	126600	8.88
1/25/2018	3:49:01 AM	126900	8.88
1/25/2018	3:54:01 AM	127200	8.88
1/25/2018	3:59:01 AM	127500	8.88
1/25/2018	4:04:01 AM	127800	8.88
1/25/2018	4:09:01 AM	128100	8.89
1/25/2018	4:14:01 AM	128400	8.88
1/25/2018	4:19:01 AM	128700	8.88
1/25/2018	4:24:01 AM	129000	8.88
1/25/2018	4:29:01 AM	129300	8.88
1/25/2018	4:34:01 AM	129600	8.87
1/25/2018	4:39:01 AM	129900	8.88
1/25/2018	4:44:01 AM	130200	8.88
1/25/2018	4:49:01 AM	130500	8.88
1/25/2018	4:54:01 AM	130800	8.88
1/25/2018	4:59:01 AM	131100	8.88
1/25/2018	5:04:01 AM	131400	8.88
1/25/2018	5:09:01 AM	131700	8.87

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	5:14:01 AM	132000	8.88
1/25/2018	5:19:01 AM	132300	8.88
1/25/2018	5:24:01 AM	132600	8.88
1/25/2018	5:29:01 AM	132900	8.88
1/25/2018	5:34:01 AM	133200	8.88
1/25/2018	5:39:01 AM	133500	8.89
1/25/2018	5:44:01 AM	133800	8.88
1/25/2018	5:49:01 AM	134100	8.88
1/25/2018	5:54:01 AM	134400	8.89
1/25/2018	5:59:01 AM	134700	8.89
1/25/2018	6:04:01 AM	135000	8.89
1/25/2018	6:09:01 AM	135300	8.89
1/25/2018	6:14:01 AM	135600	8.89
1/25/2018	6:19:01 AM	135900	8.89
1/25/2018	6:24:01 AM	136200	8.89
1/25/2018	6:29:01 AM	136500	8.89
1/25/2018	6:34:01 AM	136800	8.89
1/25/2018	6:39:01 AM	137100	8.89
1/25/2018	6:44:01 AM	137400	8.89
1/25/2018	6:49:01 AM	137700	8.89
1/25/2018	6:54:01 AM	138000	8.89
1/25/2018	6:59:01 AM	138300	8.9
1/25/2018	7:04:01 AM	138600	8.89
1/25/2018	7:09:01 AM	138900	8.89
1/25/2018	7:14:01 AM	139200	8.89
1/25/2018	7:19:01 AM	139500	8.9
1/25/2018	7:24:01 AM	139800	8.9
1/25/2018	7:29:01 AM	140100	8.9
1/25/2018	7:34:01 AM	140400	8.91
1/25/2018	7:39:01 AM	140700	8.9
1/25/2018	7:44:01 AM	141000	8.9
1/25/2018	7:49:01 AM	141300	8.9
1/25/2018	7:54:01 AM	141600	8.9
1/25/2018	7:59:01 AM	141900	8.9
1/25/2018	8:04:01 AM	142200	8.91
1/25/2018	8:09:01 AM	142500	8.9
1/25/2018	8:14:01 AM	142800	8.9
1/25/2018	8:19:01 AM	143100	8.91
1/25/2018	8:24:01 AM	143400	8.91
1/25/2018	8:29:01 AM	143700	8.91
1/25/2018	8:34:01 AM	144000	8.91
1/25/2018	8:39:01 AM	144300	8.91
1/25/2018	8:44:01 AM	144600	8.91
1/25/2018	8:49:01 AM	144900	8.92

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	8:54:01 AM	145200	8.9
1/25/2018	8:59:01 AM	145500	8.92
1/25/2018	9:04:01 AM	145800	8.92
1/25/2018	9:09:01 AM	146100	8.92
1/25/2018	9:14:01 AM	146400	8.9
1/25/2018	9:19:01 AM	146700	8.93
1/25/2018	9:24:01 AM	147000	8.92
1/25/2018	9:29:01 AM	147300	8.93
1/25/2018	9:34:01 AM	147600	8.91
1/25/2018	9:39:01 AM	147900	8.92
1/25/2018	9:44:01 AM	148200	8.92
1/25/2018	9:49:01 AM	148500	8.93
1/25/2018	9:54:01 AM	148800	8.92
1/25/2018	9:59:01 AM	149100	8.93
1/25/2018	10:04:01 AM	149400	8.91
1/25/2018	10:09:01 AM	149700	8.93
1/25/2018	10:14:01 AM	150000	8.91
1/25/2018	10:19:01 AM	150300	8.92
1/25/2018	10:24:01 AM	150600	8.93
1/25/2018	10:29:01 AM	150900	8.92
1/25/2018	10:34:01 AM	151200	8.92
1/25/2018	10:39:01 AM	151500	8.92
1/25/2018	10:44:01 AM	151800	8.91
1/25/2018	10:49:01 AM	152100	8.91
1/25/2018	10:54:01 AM	152400	8.91
1/25/2018	10:59:01 AM	152700	8.91
1/25/2018	11:04:01 AM	153000	8.91
1/25/2018	11:09:01 AM	153300	8.92
1/25/2018	11:14:01 AM	153600	8.91
1/25/2018	11:19:01 AM	153900	8.91
1/25/2018	11:24:01 AM	154200	8.88
1/25/2018	11:29:01 AM	154500	8.9
1/25/2018	11:34:01 AM	154800	8.89
1/25/2018	11:39:01 AM	155100	8.91
1/25/2018	11:44:01 AM	155400	8.88
1/25/2018	11:49:01 AM	155700	8.9
1/25/2018	11:54:01 AM	156000	8.89
1/25/2018	11:59:01 AM	156300	8.89
1/25/2018	12:04:01 PM	156600	8.88
1/25/2018	12:09:01 PM	156900	8.85
1/25/2018	12:14:01 PM	157200	8.89
1/25/2018	12:19:01 PM	157500	8.89
1/25/2018	12:24:01 PM	157800	8.9
1/25/2018	12:29:01 PM	158100	8.87

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	12:34:01 PM	158400	8.89
1/25/2018	12:39:01 PM	158700	8.88
1/25/2018	12:44:01 PM	159000	8.89
1/25/2018	12:49:01 PM	159300	8.88
1/25/2018	12:54:01 PM	159600	8.87
1/25/2018	12:59:01 PM	159900	8.89
1/25/2018	1:04:01 PM	160200	8.87
1/25/2018	1:09:01 PM	160500	8.86
1/25/2018	1:14:01 PM	160800	8.87
1/25/2018	1:19:01 PM	161100	8.87
1/25/2018	1:24:01 PM	161400	8.88
1/25/2018	1:29:01 PM	161700	8.85
1/25/2018	1:34:01 PM	162000	8.86
1/25/2018	1:39:01 PM	162300	8.85
1/25/2018	1:44:01 PM	162600	8.87
1/25/2018	1:49:01 PM	162900	8.85
1/25/2018	1:54:01 PM	163200	8.86
1/25/2018	1:59:01 PM	163500	8.86
1/25/2018	2:04:01 PM	163800	8.84
1/25/2018	2:09:01 PM	164100	8.84
1/25/2018	2:14:01 PM	164400	8.86
1/25/2018	2:19:01 PM	164700	8.85
1/25/2018	2:24:01 PM	165000	8.84
1/25/2018	2:29:01 PM	165300	8.85
1/25/2018	2:34:01 PM	165600	8.84
1/25/2018	2:39:01 PM	165900	8.84
1/25/2018	2:44:01 PM	166200	8.85
1/25/2018	2:49:01 PM	166500	8.85
1/25/2018	2:54:01 PM	166800	8.84
1/25/2018	2:59:01 PM	167100	8.84
1/25/2018	3:04:01 PM	167400	8.84
1/25/2018	3:09:01 PM	167700	8.85
1/25/2018	3:14:01 PM	168000	8.83
1/25/2018	3:19:01 PM	168300	8.85
1/25/2018	3:24:01 PM	168600	8.84
1/25/2018	3:29:01 PM	168900	8.84
1/25/2018	3:34:01 PM	169200	8.83
1/25/2018	3:39:01 PM	169500	8.83
1/25/2018	3:44:01 PM	169800	8.84
1/25/2018	3:49:01 PM	170100	8.84
1/25/2018	3:54:01 PM	170400	8.83
1/25/2018	3:59:01 PM	170700	8.83
1/25/2018	4:04:01 PM	171000	8.83
1/25/2018	4:09:01 PM	171300	8.84

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	4:14:01 PM	171600	8.83
1/25/2018	4:19:01 PM	171900	8.83
1/25/2018	4:24:01 PM	172200	8.83
1/25/2018	4:29:01 PM	172500	8.83
1/25/2018	4:34:01 PM	172800	8.84
1/25/2018	4:39:01 PM	173100	8.84
1/25/2018	4:44:01 PM	173400	8.83
1/25/2018	4:49:01 PM	173700	8.83
1/25/2018	4:54:01 PM	174000	8.84
1/25/2018	4:59:01 PM	174300	8.84
1/25/2018	5:04:01 PM	174600	8.83
1/25/2018	5:09:01 PM	174900	8.83
1/25/2018	5:14:01 PM	175200	8.83
1/25/2018	5:19:01 PM	175500	8.83
1/25/2018	5:24:01 PM	175800	8.84
1/25/2018	5:29:01 PM	176100	8.83
1/25/2018	5:34:01 PM	176400	8.83
1/25/2018	5:39:01 PM	176700	8.84
1/25/2018	5:44:01 PM	177000	8.83
1/25/2018	5:49:01 PM	177300	8.84
1/25/2018	5:54:01 PM	177600	8.84
1/25/2018	5:59:01 PM	177900	8.84
1/25/2018	6:04:01 PM	178200	8.84
1/25/2018	6:09:01 PM	178500	8.84
1/25/2018	6:14:01 PM	178800	8.85
1/25/2018	6:19:01 PM	179100	8.84
1/25/2018	6:24:01 PM	179400	8.84
1/25/2018	6:29:01 PM	179700	8.85
1/25/2018	6:34:01 PM	180000	8.85
1/25/2018	6:39:01 PM	180300	8.85
1/25/2018	6:44:01 PM	180600	8.85
1/25/2018	6:49:01 PM	180900	8.86
1/25/2018	6:54:01 PM	181200	8.85
1/25/2018	6:59:01 PM	181500	8.84
1/25/2018	7:04:01 PM	181800	8.85
1/25/2018	7:09:01 PM	182100	8.85
1/25/2018	7:14:01 PM	182400	8.85
1/25/2018	7:19:01 PM	182700	8.86
1/25/2018	7:24:01 PM	183000	8.86
1/25/2018	7:29:01 PM	183300	8.86
1/25/2018	7:34:01 PM	183600	8.86
1/25/2018	7:39:01 PM	183900	8.86
1/25/2018	7:44:01 PM	184200	8.85
1/25/2018	7:49:01 PM	184500	8.85

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	7:54:01 PM	184800	8.86
1/25/2018	7:59:01 PM	185100	8.86
1/25/2018	8:04:01 PM	185400	8.86
1/25/2018	8:09:01 PM	185700	8.86
1/25/2018	8:14:01 PM	186000	8.86
1/25/2018	8:19:01 PM	186300	8.86
1/25/2018	8:24:01 PM	186600	8.86
1/25/2018	8:29:01 PM	186900	8.86
1/25/2018	8:34:01 PM	187200	8.87
1/25/2018	8:39:01 PM	187500	8.86
1/25/2018	8:44:01 PM	187800	8.86
1/25/2018	8:49:01 PM	188100	8.86
1/25/2018	8:54:01 PM	188400	8.86
1/25/2018	8:59:01 PM	188700	8.87
1/25/2018	9:04:01 PM	189000	8.87
1/25/2018	9:09:01 PM	189300	8.87
1/25/2018	9:14:01 PM	189600	8.87
1/25/2018	9:19:01 PM	189900	8.87
1/25/2018	9:24:01 PM	190200	8.87
1/25/2018	9:29:01 PM	190500	8.87
1/25/2018	9:34:01 PM	190800	8.87
1/25/2018	9:39:01 PM	191100	8.87
1/25/2018	9:44:01 PM	191400	8.87
1/25/2018	9:49:01 PM	191700	8.87
1/25/2018	9:54:01 PM	192000	8.87
1/25/2018	9:59:01 PM	192300	8.87
1/25/2018	10:04:01 PM	192600	8.87
1/25/2018	10:09:01 PM	192900	8.87
1/25/2018	10:14:01 PM	193200	8.87
1/25/2018	10:19:01 PM	193500	8.87
1/25/2018	10:24:01 PM	193800	8.87
1/25/2018	10:29:01 PM	194100	8.87
1/25/2018	10:34:01 PM	194400	8.87
1/25/2018	10:39:01 PM	194700	8.87
1/25/2018	10:44:01 PM	195000	8.87
1/25/2018	10:49:01 PM	195300	8.87
1/25/2018	10:54:01 PM	195600	8.87
1/25/2018	10:59:01 PM	195900	8.87
1/25/2018	11:04:01 PM	196200	8.88
1/25/2018	11:09:01 PM	196500	8.88
1/25/2018	11:14:01 PM	196800	8.87
1/25/2018	11:19:01 PM	197100	8.87
1/25/2018	11:24:01 PM	197400	8.88
1/25/2018	11:29:01 PM	197700	8.87

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/25/2018	11:34:01 PM	198000	8.88
1/25/2018	11:39:01 PM	198300	8.88
1/25/2018	11:44:01 PM	198600	8.88
1/25/2018	11:49:01 PM	198900	8.88
1/25/2018	11:54:01 PM	199200	8.87
1/25/2018	11:59:01 PM	199500	8.88
1/26/2018	12:04:01 AM	199800	8.87
1/26/2018	12:09:01 AM	200100	8.88
1/26/2018	12:14:01 AM	200400	8.88
1/26/2018	12:19:01 AM	200700	8.88
1/26/2018	12:24:01 AM	201000	8.88
1/26/2018	12:29:01 AM	201300	8.88
1/26/2018	12:34:01 AM	201600	8.88
1/26/2018	12:39:01 AM	201900	8.88
1/26/2018	12:44:01 AM	202200	8.88
1/26/2018	12:49:01 AM	202500	8.88
1/26/2018	12:54:01 AM	202800	8.88
1/26/2018	12:59:01 AM	203100	8.88
1/26/2018	1:04:01 AM	203400	8.87
1/26/2018	1:09:01 AM	203700	8.88
1/26/2018	1:14:01 AM	204000	8.87
1/26/2018	1:19:01 AM	204300	8.88
1/26/2018	1:24:01 AM	204600	8.88
1/26/2018	1:29:01 AM	204900	8.87
1/26/2018	1:34:01 AM	205200	8.87
1/26/2018	1:39:01 AM	205500	8.87
1/26/2018	1:44:01 AM	205800	8.87
1/26/2018	1:49:01 AM	206100	8.87
1/26/2018	1:54:01 AM	206400	8.87
1/26/2018	1:59:01 AM	206700	8.87
1/26/2018	2:04:01 AM	207000	8.87
1/26/2018	2:09:01 AM	207300	8.87
1/26/2018	2:14:01 AM	207600	8.88
1/26/2018	2:19:01 AM	207900	8.86
1/26/2018	2:24:01 AM	208200	8.87
1/26/2018	2:29:01 AM	208500	8.87
1/26/2018	2:34:01 AM	208800	8.87
1/26/2018	2:39:01 AM	209100	8.87
1/26/2018	2:44:01 AM	209400	8.87
1/26/2018	2:49:01 AM	209700	8.87
1/26/2018	2:54:01 AM	210000	8.87
1/26/2018	2:59:01 AM	210300	8.87
1/26/2018	3:04:01 AM	210600	8.87
1/26/2018	3:09:01 AM	210900	8.87

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/26/2018	3:14:01 AM	211200	8.86
1/26/2018	3:19:01 AM	211500	8.87
1/26/2018	3:24:01 AM	211800	8.87
1/26/2018	3:29:01 AM	212100	8.86
1/26/2018	3:34:01 AM	212400	8.87
1/26/2018	3:39:01 AM	212700	8.87
1/26/2018	3:44:01 AM	213000	8.87
1/26/2018	3:49:01 AM	213300	8.87
1/26/2018	3:54:01 AM	213600	8.87
1/26/2018	3:59:01 AM	213900	8.87
1/26/2018	4:04:01 AM	214200	8.87
1/26/2018	4:09:01 AM	214500	8.87
1/26/2018	4:14:01 AM	214800	8.87
1/26/2018	4:19:01 AM	215100	8.87
1/26/2018	4:24:01 AM	215400	8.87
1/26/2018	4:29:01 AM	215700	8.87
1/26/2018	4:34:01 AM	216000	8.87
1/26/2018	4:39:01 AM	216300	8.87
1/26/2018	4:44:01 AM	216600	8.87
1/26/2018	4:49:01 AM	216900	8.87
1/26/2018	4:54:01 AM	217200	8.87
1/26/2018	4:59:01 AM	217500	8.87
1/26/2018	5:04:01 AM	217800	8.88
1/26/2018	5:09:01 AM	218100	8.88
1/26/2018	5:14:01 AM	218400	8.88
1/26/2018	5:19:01 AM	218700	8.87
1/26/2018	5:24:01 AM	219000	8.88
1/26/2018	5:29:01 AM	219300	8.88
1/26/2018	5:34:01 AM	219600	8.88
1/26/2018	5:39:01 AM	219900	8.88
1/26/2018	5:44:01 AM	220200	8.87
1/26/2018	5:49:01 AM	220500	8.88
1/26/2018	5:54:01 AM	220800	8.88
1/26/2018	5:59:01 AM	221100	8.87
1/26/2018	6:04:01 AM	221400	8.87
1/26/2018	6:09:01 AM	221700	8.88
1/26/2018	6:14:01 AM	222000	8.88
1/26/2018	6:19:01 AM	222300	8.88
1/26/2018	6:24:01 AM	222600	8.88
1/26/2018	6:29:01 AM	222900	8.88
1/26/2018	6:34:01 AM	223200	8.89
1/26/2018	6:39:01 AM	223500	8.88
1/26/2018	6:44:01 AM	223800	8.88
1/26/2018	6:49:01 AM	224100	8.87

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/26/2018	6:54:01 AM	224400	8.88
1/26/2018	6:59:01 AM	224700	8.89
1/26/2018	7:04:01 AM	225000	8.89
1/26/2018	7:09:01 AM	225300	8.89
1/26/2018	7:14:01 AM	225600	8.89
1/26/2018	7:19:01 AM	225900	8.89
1/26/2018	7:24:01 AM	226200	8.89
1/26/2018	7:29:01 AM	226500	8.89
1/26/2018	7:34:01 AM	226800	8.89
1/26/2018	7:39:01 AM	227100	8.89
1/26/2018	7:44:01 AM	227400	8.89
1/26/2018	7:49:01 AM	227700	8.89
1/26/2018	7:54:01 AM	228000	8.89
1/26/2018	7:59:01 AM	228300	8.89
1/26/2018	8:04:01 AM	228600	8.89
1/26/2018	8:09:01 AM	228900	8.89
1/26/2018	8:14:01 AM	229200	8.9
1/26/2018	8:19:01 AM	229500	8.9
1/26/2018	8:24:01 AM	229800	8.9
1/26/2018	8:29:01 AM	230100	8.91
1/26/2018	8:34:01 AM	230400	8.91
1/26/2018	8:39:01 AM	230700	8.91
1/26/2018	8:44:01 AM	231000	8.9
1/26/2018	8:49:01 AM	231300	8.9
1/26/2018	8:54:01 AM	231600	8.91
1/26/2018	8:59:01 AM	231900	8.91
1/26/2018	9:04:01 AM	232200	8.88
1/26/2018	9:09:01 AM	232500	8.91
1/26/2018	9:14:01 AM	232800	8.88
1/26/2018	9:19:01 AM	233100	8.88
1/26/2018	9:24:01 AM	233400	8.93
1/26/2018	9:29:01 AM	233700	8.89
1/26/2018	9:34:01 AM	234000	8.9
1/26/2018	9:39:01 AM	234300	8.89
1/26/2018	9:44:01 AM	234600	8.9
1/26/2018	9:49:01 AM	234900	8.9
1/26/2018	9:54:01 AM	235200	8.9
1/26/2018	9:59:01 AM	235500	8.9
1/26/2018	10:04:01 AM	235800	8.89
1/26/2018	10:09:01 AM	236100	8.89
1/26/2018	10:14:01 AM	236400	8.9
1/26/2018	10:19:01 AM	236700	8.89
1/26/2018	10:24:01 AM	237000	8.9
1/26/2018	10:29:01 AM	237300	8.9

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/26/2018	10:34:01 AM	237600	8.9
1/26/2018	10:39:01 AM	237900	8.91
1/26/2018	10:44:01 AM	238200	8.89
1/26/2018	10:49:01 AM	238500	8.89
1/26/2018	10:54:01 AM	238800	8.9
1/26/2018	10:59:01 AM	239100	8.9
1/26/2018	11:04:01 AM	239400	8.9
1/26/2018	11:09:01 AM	239700	8.9
1/26/2018	11:14:01 AM	240000	8.9
1/26/2018	11:19:01 AM	240300	8.89
1/26/2018	11:24:01 AM	240600	8.9
1/26/2018	11:29:01 AM	240900	8.89
1/26/2018	11:34:01 AM	241200	8.89
1/26/2018	11:39:01 AM	241500	8.89
1/26/2018	11:44:01 AM	241800	8.9
1/26/2018	11:49:01 AM	242100	8.91
1/26/2018	11:54:01 AM	242400	8.89
1/26/2018	11:59:01 AM	242700	8.89
1/26/2018	12:04:01 PM	243000	8.88
1/26/2018	12:09:01 PM	243300	8.89
1/26/2018	12:14:01 PM	243600	8.89
1/26/2018	12:19:01 PM	243900	8.89
1/26/2018	12:24:01 PM	244200	8.91
1/26/2018	12:29:01 PM	244500	8.88
1/26/2018	12:34:01 PM	244800	8.88
1/26/2018	12:39:01 PM	245100	8.87
1/26/2018	12:44:01 PM	245400	8.87
1/26/2018	12:49:01 PM	245700	8.88
1/26/2018	12:54:01 PM	246000	8.87
1/26/2018	12:59:01 PM	246300	8.88
1/26/2018	1:04:01 PM	246600	8.88
1/26/2018	1:09:01 PM	246900	8.86
1/26/2018	1:14:01 PM	247200	8.87
1/26/2018	1:19:01 PM	247500	8.87
1/26/2018	1:24:01 PM	247800	8.86
1/26/2018	1:29:01 PM	248100	8.86
1/26/2018	1:34:01 PM	248400	8.86
1/26/2018	1:39:01 PM	248700	8.86
1/26/2018	1:44:01 PM	249000	8.86
1/26/2018	1:49:01 PM	249300	8.86
1/26/2018	1:54:01 PM	249600	8.86
1/26/2018	1:59:01 PM	249900	8.86
1/26/2018	2:04:01 PM	250200	8.86
1/26/2018	2:09:01 PM	250500	8.87

130 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	130
1/26/2018	2:14:01 PM	250800	8.86
1/26/2018	2:19:01 PM	251100	8.86
1/26/2018	2:24:01 PM	251400	8.85
1/26/2018	2:29:01 PM	251700	8.85
1/26/2018	2:34:01 PM	252000	8.86
1/26/2018	2:39:01 PM	252300	8.86
1/26/2018	2:44:01 PM	252600	8.86
1/26/2018	2:49:01 PM	252900	8.86
1/26/2018	2:54:01 PM	253200	8.86
1/26/2018	2:59:01 PM	253500	8.86
1/26/2018	3:04:01 PM	253800	8.85
1/26/2018	3:09:01 PM	254100	8.86
1/26/2018	3:14:01 PM	254400	8.86
1/26/2018	3:19:01 PM	254700	8.86
1/26/2018	3:24:01 PM	255000	8.86
1/26/2018	3:29:01 PM	255300	8.86
1/26/2018	3:34:01 PM	255600	8.86
1/26/2018	3:39:01 PM	255900	8.86
1/26/2018	3:44:01 PM	256200	8.86
1/26/2018	3:49:01 PM	256500	8.86
1/26/2018	3:54:01 PM	256800	8.86
1/26/2018	3:59:01 PM	257100	8.86
1/26/2018	4:04:01 PM	257400	8.86
1/26/2018	4:09:01 PM	257700	8.86
1/26/2018	4:14:01 PM	258000	8.86
1/26/2018	4:19:01 PM	258300	8.86
1/26/2018	4:24:01 PM	258600	8.86
1/26/2018	4:29:01 PM	258900	8.86
1/26/2018	4:34:01 PM	259200	8.87
1/26/2018	4:39:01 PM	259500	8.87
1/26/2018	4:44:01 PM	259800	8.87
1/26/2018	4:49:01 PM	260100	8.87
1/26/2018	4:54:01 PM	260400	8.87
1/26/2018	4:59:01 PM	260700	8.87
1/26/2018	5:03:04 PM	260943	8.87

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/23/2018	4:34:01 PM	0	18.97
1/23/2018	4:39:01 PM	300	18.97
1/23/2018	4:44:01 PM	600	18.94
1/23/2018	4:49:01 PM	900	18.95
1/23/2018	4:54:01 PM	1200	18.95
1/23/2018	4:59:01 PM	1500	18.96
1/23/2018	5:04:01 PM	1800	18.96
1/23/2018	5:09:01 PM	2100	18.97
1/23/2018	5:14:01 PM	2400	18.99
1/23/2018	5:19:01 PM	2700	18.97
1/23/2018	5:24:01 PM	3000	18.97
1/23/2018	5:29:01 PM	3300	18.97
1/23/2018	5:34:01 PM	3600	18.97
1/23/2018	5:39:01 PM	3900	18.97
1/23/2018	5:44:01 PM	4200	18.97
1/23/2018	5:49:01 PM	4500	18.97
1/23/2018	5:54:01 PM	4800	18.98
1/23/2018	5:59:01 PM	5100	18.98
1/23/2018	6:04:01 PM	5400	18.98
1/23/2018	6:09:01 PM	5700	18.98
1/23/2018	6:14:01 PM	6000	18.98
1/23/2018	6:19:01 PM	6300	18.98
1/23/2018	6:24:01 PM	6600	18.98
1/23/2018	6:29:01 PM	6900	18.99
1/23/2018	6:34:01 PM	7200	18.99
1/23/2018	6:39:01 PM	7500	18.98
1/23/2018	6:44:01 PM	7800	18.99
1/23/2018	6:49:01 PM	8100	18.99
1/23/2018	6:54:01 PM	8400	18.99
1/23/2018	6:59:01 PM	8700	18.99
1/23/2018	7:04:01 PM	9000	19
1/23/2018	7:09:01 PM	9300	19.01
1/23/2018	7:14:01 PM	9600	18.99
1/23/2018	7:19:01 PM	9900	19
1/23/2018	7:24:01 PM	10200	18.99
1/23/2018	7:29:01 PM	10500	19
1/23/2018	7:34:01 PM	10800	18.99
1/23/2018	7:39:01 PM	11100	18.99
1/23/2018	7:44:01 PM	11400	19
1/23/2018	7:49:01 PM	11700	19
1/23/2018	7:54:01 PM	12000	19
1/23/2018	7:59:01 PM	12300	19
1/23/2018	8:04:01 PM	12600	19
1/23/2018	8:09:01 PM	12900	19

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/23/2018	8:14:01 PM	13200	19
1/23/2018	8:19:01 PM	13500	19
1/23/2018	8:24:01 PM	13800	19.01
1/23/2018	8:29:01 PM	14100	19
1/23/2018	8:34:01 PM	14400	19
1/23/2018	8:39:01 PM	14700	19.01
1/23/2018	8:44:01 PM	15000	19.01
1/23/2018	8:49:01 PM	15300	19.01
1/23/2018	8:54:01 PM	15600	19.01
1/23/2018	8:59:01 PM	15900	19.01
1/23/2018	9:04:01 PM	16200	19.01
1/23/2018	9:09:01 PM	16500	19.01
1/23/2018	9:14:01 PM	16800	19.01
1/23/2018	9:19:01 PM	17100	19.01
1/23/2018	9:24:01 PM	17400	19.01
1/23/2018	9:29:01 PM	17700	19.01
1/23/2018	9:34:01 PM	18000	19.01
1/23/2018	9:39:01 PM	18300	19.02
1/23/2018	9:44:01 PM	18600	19.02
1/23/2018	9:49:01 PM	18900	19.02
1/23/2018	9:54:01 PM	19200	19.02
1/23/2018	9:59:01 PM	19500	19.02
1/23/2018	10:04:01 PM	19800	19.02
1/23/2018	10:09:01 PM	20100	19.03
1/23/2018	10:14:01 PM	20400	19.02
1/23/2018	10:19:01 PM	20700	19.02
1/23/2018	10:24:01 PM	21000	19.02
1/23/2018	10:29:01 PM	21300	19.02
1/23/2018	10:34:01 PM	21600	19.02
1/23/2018	10:39:01 PM	21900	19.02
1/23/2018	10:44:01 PM	22200	19.03
1/23/2018	10:49:01 PM	22500	19.02
1/23/2018	10:54:01 PM	22800	19.02
1/23/2018	10:59:01 PM	23100	19.02
1/23/2018	11:04:01 PM	23400	19.02
1/23/2018	11:09:01 PM	23700	19.03
1/23/2018	11:14:01 PM	24000	19.03
1/23/2018	11:19:01 PM	24300	19.03
1/23/2018	11:24:01 PM	24600	19.02
1/23/2018	11:29:01 PM	24900	19.02
1/23/2018	11:34:01 PM	25200	19.02
1/23/2018	11:39:01 PM	25500	19.04
1/23/2018	11:44:01 PM	25800	19.03
1/23/2018	11:49:01 PM	26100	19.03

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/23/2018	11:54:01 PM	26400	19.03
1/23/2018	11:59:01 PM	26700	19.03
1/24/2018	12:04:01 AM	27000	19.03
1/24/2018	12:09:01 AM	27300	19.03
1/24/2018	12:14:01 AM	27600	19.03
1/24/2018	12:19:01 AM	27900	19.03
1/24/2018	12:24:01 AM	28200	19.03
1/24/2018	12:29:01 AM	28500	19.04
1/24/2018	12:34:01 AM	28800	19.04
1/24/2018	12:39:01 AM	29100	19.03
1/24/2018	12:44:01 AM	29400	19.04
1/24/2018	12:49:01 AM	29700	19.03
1/24/2018	12:54:01 AM	30000	19.03
1/24/2018	12:59:01 AM	30300	19.04
1/24/2018	1:04:01 AM	30600	19.03
1/24/2018	1:09:01 AM	30900	19.04
1/24/2018	1:14:01 AM	31200	19.04
1/24/2018	1:19:01 AM	31500	19.04
1/24/2018	1:24:01 AM	31800	19.04
1/24/2018	1:29:01 AM	32100	19.04
1/24/2018	1:34:01 AM	32400	19.04
1/24/2018	1:39:01 AM	32700	19.04
1/24/2018	1:44:01 AM	33000	19.04
1/24/2018	1:49:01 AM	33300	19.04
1/24/2018	1:54:01 AM	33600	19.04
1/24/2018	1:59:01 AM	33900	19.04
1/24/2018	2:04:01 AM	34200	19.04
1/24/2018	2:09:01 AM	34500	19.03
1/24/2018	2:14:01 AM	34800	19.04
1/24/2018	2:19:01 AM	35100	19.04
1/24/2018	2:24:01 AM	35400	19.04
1/24/2018	2:29:01 AM	35700	19.05
1/24/2018	2:34:01 AM	36000	19.04
1/24/2018	2:39:01 AM	36300	19.04
1/24/2018	2:44:01 AM	36600	19.04
1/24/2018	2:49:01 AM	36900	19.04
1/24/2018	2:54:01 AM	37200	19.04
1/24/2018	2:59:01 AM	37500	19.04
1/24/2018	3:04:01 AM	37800	19.04
1/24/2018	3:09:01 AM	38100	19.04
1/24/2018	3:14:01 AM	38400	19.04
1/24/2018	3:19:01 AM	38700	19.05
1/24/2018	3:24:01 AM	39000	19.04
1/24/2018	3:29:01 AM	39300	19.05

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/24/2018	3:34:01 AM	39600	19.05
1/24/2018	3:39:01 AM	39900	19.05
1/24/2018	3:44:01 AM	40200	19.05
1/24/2018	3:49:01 AM	40500	19.05
1/24/2018	3:54:01 AM	40800	19.05
1/24/2018	3:59:01 AM	41100	19.05
1/24/2018	4:04:01 AM	41400	19.05
1/24/2018	4:09:01 AM	41700	19.05
1/24/2018	4:14:01 AM	42000	19.04
1/24/2018	4:19:01 AM	42300	19.05
1/24/2018	4:24:01 AM	42600	19.05
1/24/2018	4:29:01 AM	42900	19.06
1/24/2018	4:34:01 AM	43200	19.06
1/24/2018	4:39:01 AM	43500	19.05
1/24/2018	4:44:01 AM	43800	19.06
1/24/2018	4:49:01 AM	44100	19.05
1/24/2018	4:54:01 AM	44400	19.06
1/24/2018	4:59:01 AM	44700	19.05
1/24/2018	5:04:01 AM	45000	19.06
1/24/2018	5:09:01 AM	45300	19.05
1/24/2018	5:14:01 AM	45600	19.05
1/24/2018	5:19:01 AM	45900	19.05
1/24/2018	5:24:01 AM	46200	19.06
1/24/2018	5:29:01 AM	46500	19.06
1/24/2018	5:34:01 AM	46800	19.06
1/24/2018	5:39:01 AM	47100	19.06
1/24/2018	5:44:01 AM	47400	19.05
1/24/2018	5:49:01 AM	47700	19.06
1/24/2018	5:54:01 AM	48000	19.06
1/24/2018	5:59:01 AM	48300	19.06
1/24/2018	6:04:01 AM	48600	19.06
1/24/2018	6:09:01 AM	48900	19.06
1/24/2018	6:14:01 AM	49200	19.06
1/24/2018	6:19:01 AM	49500	19.06
1/24/2018	6:24:01 AM	49800	19.06
1/24/2018	6:29:01 AM	50100	19.06
1/24/2018	6:34:01 AM	50400	19.06
1/24/2018	6:39:01 AM	50700	19.07
1/24/2018	6:44:01 AM	51000	19.06
1/24/2018	6:49:01 AM	51300	19.06
1/24/2018	6:54:01 AM	51600	19.06
1/24/2018	6:59:01 AM	51900	19.06
1/24/2018	7:04:01 AM	52200	19.06
1/24/2018	7:09:01 AM	52500	19.07

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/24/2018	7:14:01 AM	52800	19.06
1/24/2018	7:19:01 AM	53100	19.07
1/24/2018	7:24:01 AM	53400	19.07
1/24/2018	7:29:01 AM	53700	19.07
1/24/2018	7:34:01 AM	54000	19.07
1/24/2018	7:39:01 AM	54300	19.08
1/24/2018	7:44:01 AM	54600	19.08
1/24/2018	7:49:01 AM	54900	19.08
1/24/2018	7:54:01 AM	55200	19.08
1/24/2018	7:59:01 AM	55500	19.08
1/24/2018	8:04:01 AM	55800	19.08
1/24/2018	8:09:01 AM	56100	19.09
1/24/2018	8:14:01 AM	56400	19.1
1/24/2018	8:19:01 AM	56700	19.1
1/24/2018	8:24:01 AM	57000	19.1
1/24/2018	8:29:01 AM	57300	19.1
1/24/2018	8:34:01 AM	57600	19.1
1/24/2018	8:39:01 AM	57900	19.11
1/24/2018	8:44:01 AM	58200	19.12
1/24/2018	8:49:01 AM	58500	19.12
1/24/2018	8:54:01 AM	58800	19.13
1/24/2018	8:59:01 AM	59100	19.13
1/24/2018	9:04:01 AM	59400	19.13
1/24/2018	9:09:01 AM	59700	19.13
1/24/2018	9:14:01 AM	60000	19.14
1/24/2018	9:19:01 AM	60300	19.15
1/24/2018	9:24:01 AM	60600	19.14
1/24/2018	9:29:01 AM	60900	19.15
1/24/2018	9:34:01 AM	61200	19.17
1/24/2018	9:39:01 AM	61500	19.16
1/24/2018	9:44:01 AM	61800	19.15
1/24/2018	9:49:01 AM	62100	19.15
1/24/2018	9:54:01 AM	62400	19.15
1/24/2018	9:59:01 AM	62700	19.16
1/24/2018	10:04:01 AM	63000	19.17
1/24/2018	10:09:01 AM	63300	19.15
1/24/2018	10:14:01 AM	63600	19.14
1/24/2018	10:19:01 AM	63900	19.16
1/24/2018	10:24:01 AM	64200	19.17
1/24/2018	10:29:01 AM	64500	19.15
1/24/2018	10:34:01 AM	64800	19.17
1/24/2018	10:39:01 AM	65100	19.16
1/24/2018	10:44:01 AM	65400	19.13
1/24/2018	10:49:01 AM	65700	19.17

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/24/2018	10:54:01 AM	66000	19.14
1/24/2018	10:59:01 AM	66300	19.17
1/24/2018	11:04:01 AM	66600	19.16
1/24/2018	11:09:01 AM	66900	19.14
1/24/2018	11:14:01 AM	67200	19.14
1/24/2018	11:19:01 AM	67500	19.13
1/24/2018	11:24:01 AM	67800	19.15
1/24/2018	11:29:01 AM	68100	19.13
1/24/2018	11:34:01 AM	68400	19.13
1/24/2018	11:39:01 AM	68700	19.12
1/24/2018	11:44:01 AM	69000	19.15
1/24/2018	11:49:01 AM	69300	19.15
1/24/2018	11:54:01 AM	69600	19.1
1/24/2018	11:59:01 AM	69900	19.15
1/24/2018	12:04:01 PM	70200	19.15
1/24/2018	12:09:01 PM	70500	19.13
1/24/2018	12:14:01 PM	70800	19.1
1/24/2018	12:19:01 PM	71100	19.15
1/24/2018	12:24:01 PM	71400	19.14
1/24/2018	12:29:01 PM	71700	19.1
1/24/2018	12:34:01 PM	72000	19.15
1/24/2018	12:39:01 PM	72300	19.15
1/24/2018	12:44:01 PM	72600	19.13
1/24/2018	12:49:01 PM	72900	19.12
1/24/2018	12:54:01 PM	73200	19.12
1/24/2018	12:59:01 PM	73500	19.1
1/24/2018	1:04:01 PM	73800	19.11
1/24/2018	1:09:01 PM	74100	19.1
1/24/2018	1:14:01 PM	74400	19.13
1/24/2018	1:19:01 PM	74700	19.1
1/24/2018	1:24:01 PM	75000	19.1
1/24/2018	1:29:01 PM	75300	19.12
1/24/2018	1:34:01 PM	75600	19.12
1/24/2018	1:39:01 PM	75900	19.13
1/24/2018	1:44:01 PM	76200	19.13
1/24/2018	1:49:01 PM	76500	19.12
1/24/2018	1:54:01 PM	76800	19.1
1/24/2018	1:59:01 PM	77100	19.13
1/24/2018	2:04:01 PM	77400	19.12
1/24/2018	2:09:01 PM	77700	19.08
1/24/2018	2:14:01 PM	78000	19.03
1/24/2018	2:19:01 PM	78300	19.06
1/24/2018	2:24:01 PM	78600	19.1
1/24/2018	2:29:01 PM	78900	19.08

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/24/2018	2:34:01 PM	79200	19.04
1/24/2018	2:39:01 PM	79500	19.07
1/24/2018	2:44:01 PM	79800	19.07
1/24/2018	2:49:01 PM	80100	19.05
1/24/2018	2:54:01 PM	80400	19.07
1/24/2018	2:59:01 PM	80700	19.07
1/24/2018	3:04:01 PM	81000	19.08
1/24/2018	3:09:01 PM	81300	19.04
1/24/2018	3:14:01 PM	81600	19.05
1/24/2018	3:19:01 PM	81900	19.03
1/24/2018	3:24:01 PM	82200	19.07
1/24/2018	3:29:01 PM	82500	19.06
1/24/2018	3:34:01 PM	82800	19.06
1/24/2018	3:39:01 PM	83100	19.07
1/24/2018	3:44:01 PM	83400	19.07
1/24/2018	3:49:01 PM	83700	19.06
1/24/2018	3:54:01 PM	84000	19.05
1/24/2018	3:59:01 PM	84300	19.05
1/24/2018	4:04:01 PM	84600	19.05
1/24/2018	4:09:01 PM	84900	19.05
1/24/2018	4:14:01 PM	85200	19.04
1/24/2018	4:19:01 PM	85500	19.04
1/24/2018	4:24:01 PM	85800	19.03
1/24/2018	4:29:01 PM	86100	19.03
1/24/2018	4:34:01 PM	86400	19.03
1/24/2018	4:39:01 PM	86700	19.02
1/24/2018	4:44:01 PM	87000	19
1/24/2018	4:49:01 PM	87300	18.99
1/24/2018	4:54:01 PM	87600	19
1/24/2018	4:59:01 PM	87900	19.01
1/24/2018	5:04:01 PM	88200	19.01
1/24/2018	5:09:01 PM	88500	19.01
1/24/2018	5:14:01 PM	88800	19.02
1/24/2018	5:19:01 PM	89100	19.01
1/24/2018	5:24:01 PM	89400	19.02
1/24/2018	5:29:01 PM	89700	19.02
1/24/2018	5:34:01 PM	90000	19.02
1/24/2018	5:39:01 PM	90300	19.02
1/24/2018	5:44:01 PM	90600	19.02
1/24/2018	5:49:01 PM	90900	19.02
1/24/2018	5:54:01 PM	91200	19.02
1/24/2018	5:59:01 PM	91500	19.03
1/24/2018	6:04:01 PM	91800	19.03
1/24/2018	6:09:01 PM	92100	19.03

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/24/2018	6:14:01 PM	92400	19.04
1/24/2018	6:19:01 PM	92700	19.03
1/24/2018	6:24:01 PM	93000	19.02
1/24/2018	6:29:01 PM	93300	19.03
1/24/2018	6:34:01 PM	93600	19.03
1/24/2018	6:39:01 PM	93900	19.04
1/24/2018	6:44:01 PM	94200	19.03
1/24/2018	6:49:01 PM	94500	19.03
1/24/2018	6:54:01 PM	94800	19.03
1/24/2018	6:59:01 PM	95100	19.03
1/24/2018	7:04:01 PM	95400	19.03
1/24/2018	7:09:01 PM	95700	19.03
1/24/2018	7:14:01 PM	96000	19.04
1/24/2018	7:19:01 PM	96300	19.02
1/24/2018	7:24:01 PM	96600	19.03
1/24/2018	7:29:01 PM	96900	19.03
1/24/2018	7:34:01 PM	97200	19.04
1/24/2018	7:39:01 PM	97500	19.04
1/24/2018	7:44:01 PM	97800	19.03
1/24/2018	7:49:01 PM	98100	19.04
1/24/2018	7:54:01 PM	98400	19.04
1/24/2018	7:59:01 PM	98700	19.04
1/24/2018	8:04:01 PM	99000	19.04
1/24/2018	8:09:01 PM	99300	19.04
1/24/2018	8:14:01 PM	99600	19.05
1/24/2018	8:19:01 PM	99900	19.04
1/24/2018	8:24:01 PM	100200	19.04
1/24/2018	8:29:01 PM	100500	19.04
1/24/2018	8:34:01 PM	100800	19.04
1/24/2018	8:39:01 PM	101100	19.04
1/24/2018	8:44:01 PM	101400	19.04
1/24/2018	8:49:01 PM	101700	19.04
1/24/2018	8:54:01 PM	102000	19.04
1/24/2018	8:59:01 PM	102300	19.05
1/24/2018	9:04:01 PM	102600	19.04
1/24/2018	9:09:01 PM	102900	19.05
1/24/2018	9:14:01 PM	103200	19.05
1/24/2018	9:19:01 PM	103500	19.04
1/24/2018	9:24:01 PM	103800	19.04
1/24/2018	9:29:01 PM	104100	19.04
1/24/2018	9:34:01 PM	104400	19.05
1/24/2018	9:39:01 PM	104700	19.04
1/24/2018	9:44:01 PM	105000	19.04
1/24/2018	9:49:01 PM	105300	19.05

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/24/2018	9:54:01 PM	105600	19.05
1/24/2018	9:59:01 PM	105900	19.05
1/24/2018	10:04:01 PM	106200	19.05
1/24/2018	10:09:01 PM	106500	19.05
1/24/2018	10:14:01 PM	106800	19.05
1/24/2018	10:19:01 PM	107100	19.05
1/24/2018	10:24:01 PM	107400	19.05
1/24/2018	10:29:01 PM	107700	19.05
1/24/2018	10:34:01 PM	108000	19.05
1/24/2018	10:39:01 PM	108300	19.05
1/24/2018	10:44:01 PM	108600	19.05
1/24/2018	10:49:01 PM	108900	19.05
1/24/2018	10:54:01 PM	109200	19.05
1/24/2018	10:59:01 PM	109500	19.05
1/24/2018	11:04:01 PM	109800	19.06
1/24/2018	11:09:01 PM	110100	19.06
1/24/2018	11:14:01 PM	110400	19.05
1/24/2018	11:19:01 PM	110700	19.06
1/24/2018	11:24:01 PM	111000	19.05
1/24/2018	11:29:01 PM	111300	19.06
1/24/2018	11:34:01 PM	111600	19.05
1/24/2018	11:39:01 PM	111900	19.05
1/24/2018	11:44:01 PM	112200	19.06
1/24/2018	11:49:01 PM	112500	19.06
1/24/2018	11:54:01 PM	112800	19.06
1/24/2018	11:59:01 PM	113100	19.06
1/25/2018	12:04:01 AM	113400	19.06
1/25/2018	12:09:01 AM	113700	19.05
1/25/2018	12:14:01 AM	114000	19.06
1/25/2018	12:19:01 AM	114300	19.06
1/25/2018	12:24:01 AM	114600	19.06
1/25/2018	12:29:01 AM	114900	19.05
1/25/2018	12:34:01 AM	115200	19.06
1/25/2018	12:39:01 AM	115500	19.06
1/25/2018	12:44:01 AM	115800	19.06
1/25/2018	12:49:01 AM	116100	19.06
1/25/2018	12:54:01 AM	116400	19.06
1/25/2018	12:59:01 AM	116700	19.05
1/25/2018	1:04:01 AM	117000	19.06
1/25/2018	1:09:01 AM	117300	19.06
1/25/2018	1:14:01 AM	117600	19.06
1/25/2018	1:19:01 AM	117900	19.06
1/25/2018	1:24:01 AM	118200	19.06
1/25/2018	1:29:01 AM	118500	19.05

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/25/2018	1:34:01 AM	118800	19.06
1/25/2018	1:39:01 AM	119100	19.06
1/25/2018	1:44:01 AM	119400	19.06
1/25/2018	1:49:01 AM	119700	19.06
1/25/2018	1:54:01 AM	120000	19.05
1/25/2018	1:59:01 AM	120300	19.06
1/25/2018	2:04:01 AM	120600	19.06
1/25/2018	2:09:01 AM	120900	19.06
1/25/2018	2:14:01 AM	121200	19.06
1/25/2018	2:19:01 AM	121500	19.06
1/25/2018	2:24:01 AM	121800	19.06
1/25/2018	2:29:01 AM	122100	19.06
1/25/2018	2:34:01 AM	122400	19.06
1/25/2018	2:39:01 AM	122700	19.06
1/25/2018	2:44:01 AM	123000	19.06
1/25/2018	2:49:01 AM	123300	19.06
1/25/2018	2:54:01 AM	123600	19.06
1/25/2018	2:59:01 AM	123900	19.06
1/25/2018	3:04:01 AM	124200	19.06
1/25/2018	3:09:01 AM	124500	19.06
1/25/2018	3:14:01 AM	124800	19.06
1/25/2018	3:19:01 AM	125100	19.06
1/25/2018	3:24:01 AM	125400	19.06
1/25/2018	3:29:01 AM	125700	19.06
1/25/2018	3:34:01 AM	126000	19.06
1/25/2018	3:39:01 AM	126300	19.06
1/25/2018	3:44:01 AM	126600	19.06
1/25/2018	3:49:01 AM	126900	19.06
1/25/2018	3:54:01 AM	127200	19.05
1/25/2018	3:59:01 AM	127500	19.05
1/25/2018	4:04:01 AM	127800	19.06
1/25/2018	4:09:01 AM	128100	19.06
1/25/2018	4:14:01 AM	128400	19.06
1/25/2018	4:19:01 AM	128700	19.06
1/25/2018	4:24:01 AM	129000	19.06
1/25/2018	4:29:01 AM	129300	19.06
1/25/2018	4:34:01 AM	129600	19.06
1/25/2018	4:39:01 AM	129900	19.05
1/25/2018	4:44:01 AM	130200	19.06
1/25/2018	4:49:01 AM	130500	19.06
1/25/2018	4:54:01 AM	130800	19.06
1/25/2018	4:59:01 AM	131100	19.06
1/25/2018	5:04:01 AM	131400	19.06
1/25/2018	5:09:01 AM	131700	19.06

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/25/2018	5:14:01 AM	132000	19.05
1/25/2018	5:19:01 AM	132300	19.05
1/25/2018	5:24:01 AM	132600	19.06
1/25/2018	5:29:01 AM	132900	19.06
1/25/2018	5:34:01 AM	133200	19.06
1/25/2018	5:39:01 AM	133500	19.06
1/25/2018	5:44:01 AM	133800	19.05
1/25/2018	5:49:01 AM	134100	19.06
1/25/2018	5:54:01 AM	134400	19.06
1/25/2018	5:59:01 AM	134700	19.06
1/25/2018	6:04:01 AM	135000	19.06
1/25/2018	6:09:01 AM	135300	19.06
1/25/2018	6:14:01 AM	135600	19.06
1/25/2018	6:19:01 AM	135900	19.06
1/25/2018	6:24:01 AM	136200	19.06
1/25/2018	6:29:01 AM	136500	19.06
1/25/2018	6:34:01 AM	136800	19.06
1/25/2018	6:39:01 AM	137100	19.06
1/25/2018	6:44:01 AM	137400	19.06
1/25/2018	6:49:01 AM	137700	19.07
1/25/2018	6:54:01 AM	138000	19.06
1/25/2018	6:59:01 AM	138300	19.07
1/25/2018	7:04:01 AM	138600	19.06
1/25/2018	7:09:01 AM	138900	19.06
1/25/2018	7:14:01 AM	139200	19.06
1/25/2018	7:19:01 AM	139500	19.06
1/25/2018	7:24:01 AM	139800	19.06
1/25/2018	7:29:01 AM	140100	19.07
1/25/2018	7:34:01 AM	140400	19.08
1/25/2018	7:39:01 AM	140700	19.07
1/25/2018	7:44:01 AM	141000	19.07
1/25/2018	7:49:01 AM	141300	19.07
1/25/2018	7:54:01 AM	141600	19.08
1/25/2018	7:59:01 AM	141900	19.08
1/25/2018	8:04:01 AM	142200	19.08
1/25/2018	8:09:01 AM	142500	19.07
1/25/2018	8:14:01 AM	142800	19.09
1/25/2018	8:19:01 AM	143100	19.09
1/25/2018	8:24:01 AM	143400	19.09
1/25/2018	8:29:01 AM	143700	19.1
1/25/2018	8:34:01 AM	144000	19.1
1/25/2018	8:39:01 AM	144300	19.09
1/25/2018	8:44:01 AM	144600	19.11
1/25/2018	8:49:01 AM	144900	19.13

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/25/2018	8:54:01 AM	145200	19.09
1/25/2018	8:59:01 AM	145500	19.13
1/25/2018	9:04:01 AM	145800	19.1
1/25/2018	9:09:01 AM	146100	19.14
1/25/2018	9:14:01 AM	146400	19.1
1/25/2018	9:19:01 AM	146700	19.18
1/25/2018	9:24:01 AM	147000	19.07
1/25/2018	9:29:01 AM	147300	19.21
1/25/2018	9:34:01 AM	147600	19.11
1/25/2018	9:39:01 AM	147900	19.16
1/25/2018	9:44:01 AM	148200	19.15
1/25/2018	9:49:01 AM	148500	19.14
1/25/2018	9:54:01 AM	148800	19.12
1/25/2018	9:59:01 AM	149100	19.17
1/25/2018	10:04:01 AM	149400	19.14
1/25/2018	10:09:01 AM	149700	19.18
1/25/2018	10:14:01 AM	150000	19.12
1/25/2018	10:19:01 AM	150300	19.14
1/25/2018	10:24:01 AM	150600	19.15
1/25/2018	10:29:01 AM	150900	19.15
1/25/2018	10:34:01 AM	151200	19.13
1/25/2018	10:39:01 AM	151500	19.16
1/25/2018	10:44:01 AM	151800	19.09
1/25/2018	10:49:01 AM	152100	19.17
1/25/2018	10:54:01 AM	152400	19.08
1/25/2018	10:59:01 AM	152700	19.17
1/25/2018	11:04:01 AM	153000	19.12
1/25/2018	11:09:01 AM	153300	19.14
1/25/2018	11:14:01 AM	153600	19.09
1/25/2018	11:19:01 AM	153900	19.14
1/25/2018	11:24:01 AM	154200	19.09
1/25/2018	11:29:01 AM	154500	19.11
1/25/2018	11:34:01 AM	154800	19.08
1/25/2018	11:39:01 AM	155100	19.18
1/25/2018	11:44:01 AM	155400	19
1/25/2018	11:49:01 AM	155700	19.1
1/25/2018	11:54:01 AM	156000	19.21
1/25/2018	11:59:01 AM	156300	19.11
1/25/2018	12:04:01 PM	156600	19.07
1/25/2018	12:09:01 PM	156900	18.97
1/25/2018	12:14:01 PM	157200	19.16
1/25/2018	12:19:01 PM	157500	19.2
1/25/2018	12:24:01 PM	157800	19.21
1/25/2018	12:29:01 PM	158100	19.05

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/25/2018	12:34:01 PM	158400	19.14
1/25/2018	12:39:01 PM	158700	19.14
1/25/2018	12:44:01 PM	159000	19.14
1/25/2018	12:49:01 PM	159300	19.13
1/25/2018	12:54:01 PM	159600	19.07
1/25/2018	12:59:01 PM	159900	19.18
1/25/2018	1:04:01 PM	160200	19.05
1/25/2018	1:09:01 PM	160500	19.06
1/25/2018	1:14:01 PM	160800	19.13
1/25/2018	1:19:01 PM	161100	19.04
1/25/2018	1:24:01 PM	161400	19.13
1/25/2018	1:29:01 PM	161700	19.09
1/25/2018	1:34:01 PM	162000	19.14
1/25/2018	1:39:01 PM	162300	19.05
1/25/2018	1:44:01 PM	162600	19.17
1/25/2018	1:49:01 PM	162900	19.07
1/25/2018	1:54:01 PM	163200	19.15
1/25/2018	1:59:01 PM	163500	19.11
1/25/2018	2:04:01 PM	163800	18.99
1/25/2018	2:09:01 PM	164100	19.07
1/25/2018	2:14:01 PM	164400	19.06
1/25/2018	2:19:01 PM	164700	19.03
1/25/2018	2:24:01 PM	165000	19.05
1/25/2018	2:29:01 PM	165300	19.09
1/25/2018	2:34:01 PM	165600	19.04
1/25/2018	2:39:01 PM	165900	19.05
1/25/2018	2:44:01 PM	166200	19.05
1/25/2018	2:49:01 PM	166500	19.07
1/25/2018	2:54:01 PM	166800	18.99
1/25/2018	2:59:01 PM	167100	19.02
1/25/2018	3:04:01 PM	167400	19.06
1/25/2018	3:09:01 PM	167700	19.03
1/25/2018	3:14:01 PM	168000	19.04
1/25/2018	3:19:01 PM	168300	19.03
1/25/2018	3:24:01 PM	168600	19.01
1/25/2018	3:29:01 PM	168900	19.04
1/25/2018	3:34:01 PM	169200	19.05
1/25/2018	3:39:01 PM	169500	19
1/25/2018	3:44:01 PM	169800	19.01
1/25/2018	3:49:01 PM	170100	19.05
1/25/2018	3:54:01 PM	170400	19.02
1/25/2018	3:59:01 PM	170700	19
1/25/2018	4:04:01 PM	171000	19
1/25/2018	4:09:01 PM	171300	19.04

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/25/2018	4:14:01 PM	171600	19.01
1/25/2018	4:19:01 PM	171900	18.99
1/25/2018	4:24:01 PM	172200	18.97
1/25/2018	4:29:01 PM	172500	18.99
1/25/2018	4:34:01 PM	172800	19.02
1/25/2018	4:39:01 PM	173100	18.99
1/25/2018	4:44:01 PM	173400	19
1/25/2018	4:49:01 PM	173700	18.98
1/25/2018	4:54:01 PM	174000	19
1/25/2018	4:59:01 PM	174300	19.01
1/25/2018	5:04:01 PM	174600	18.97
1/25/2018	5:09:01 PM	174900	18.98
1/25/2018	5:14:01 PM	175200	19
1/25/2018	5:19:01 PM	175500	18.98
1/25/2018	5:24:01 PM	175800	19
1/25/2018	5:29:01 PM	176100	18.97
1/25/2018	5:34:01 PM	176400	18.98
1/25/2018	5:39:01 PM	176700	18.98
1/25/2018	5:44:01 PM	177000	18.98
1/25/2018	5:49:01 PM	177300	18.98
1/25/2018	5:54:01 PM	177600	18.98
1/25/2018	5:59:01 PM	177900	18.98
1/25/2018	6:04:01 PM	178200	18.98
1/25/2018	6:09:01 PM	178500	19
1/25/2018	6:14:01 PM	178800	18.99
1/25/2018	6:19:01 PM	179100	18.99
1/25/2018	6:24:01 PM	179400	18.99
1/25/2018	6:29:01 PM	179700	18.99
1/25/2018	6:34:01 PM	180000	18.99
1/25/2018	6:39:01 PM	180300	19
1/25/2018	6:44:01 PM	180600	18.99
1/25/2018	6:49:01 PM	180900	19
1/25/2018	6:54:01 PM	181200	18.99
1/25/2018	6:59:01 PM	181500	18.99
1/25/2018	7:04:01 PM	181800	19
1/25/2018	7:09:01 PM	182100	18.99
1/25/2018	7:14:01 PM	182400	18.99
1/25/2018	7:19:01 PM	182700	18.99
1/25/2018	7:24:01 PM	183000	19
1/25/2018	7:29:01 PM	183300	18.98
1/25/2018	7:34:01 PM	183600	18.99
1/25/2018	7:39:01 PM	183900	18.99
1/25/2018	7:44:01 PM	184200	18.99
1/25/2018	7:49:01 PM	184500	18.99

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/25/2018	7:54:01 PM	184800	18.99
1/25/2018	7:59:01 PM	185100	18.99
1/25/2018	8:04:01 PM	185400	19
1/25/2018	8:09:01 PM	185700	18.99
1/25/2018	8:14:01 PM	186000	19
1/25/2018	8:19:01 PM	186300	18.99
1/25/2018	8:24:01 PM	186600	18.99
1/25/2018	8:29:01 PM	186900	18.99
1/25/2018	8:34:01 PM	187200	18.99
1/25/2018	8:39:01 PM	187500	19
1/25/2018	8:44:01 PM	187800	18.99
1/25/2018	8:49:01 PM	188100	18.99
1/25/2018	8:54:01 PM	188400	19
1/25/2018	8:59:01 PM	188700	19
1/25/2018	9:04:01 PM	189000	19
1/25/2018	9:09:01 PM	189300	19
1/25/2018	9:14:01 PM	189600	19
1/25/2018	9:19:01 PM	189900	18.99
1/25/2018	9:24:01 PM	190200	19
1/25/2018	9:29:01 PM	190500	18.99
1/25/2018	9:34:01 PM	190800	19
1/25/2018	9:39:01 PM	191100	19
1/25/2018	9:44:01 PM	191400	18.99
1/25/2018	9:49:01 PM	191700	19
1/25/2018	9:54:01 PM	192000	18.99
1/25/2018	9:59:01 PM	192300	18.99
1/25/2018	10:04:01 PM	192600	18.99
1/25/2018	10:09:01 PM	192900	19
1/25/2018	10:14:01 PM	193200	19
1/25/2018	10:19:01 PM	193500	19.01
1/25/2018	10:24:01 PM	193800	19
1/25/2018	10:29:01 PM	194100	19
1/25/2018	10:34:01 PM	194400	19
1/25/2018	10:39:01 PM	194700	19
1/25/2018	10:44:01 PM	195000	19
1/25/2018	10:49:01 PM	195300	19
1/25/2018	10:54:01 PM	195600	19
1/25/2018	10:59:01 PM	195900	19
1/25/2018	11:04:01 PM	196200	19.01
1/25/2018	11:09:01 PM	196500	19.01
1/25/2018	11:14:01 PM	196800	19.02
1/25/2018	11:19:01 PM	197100	19.01
1/25/2018	11:24:01 PM	197400	19.01
1/25/2018	11:29:01 PM	197700	19

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/25/2018	11:34:01 PM	198000	19
1/25/2018	11:39:01 PM	198300	19
1/25/2018	11:44:01 PM	198600	19
1/25/2018	11:49:01 PM	198900	19
1/25/2018	11:54:01 PM	199200	19
1/25/2018	11:59:01 PM	199500	19
1/26/2018	12:04:01 AM	199800	19
1/26/2018	12:09:01 AM	200100	19.01
1/26/2018	12:14:01 AM	200400	19.01
1/26/2018	12:19:01 AM	200700	19
1/26/2018	12:24:01 AM	201000	19.01
1/26/2018	12:29:01 AM	201300	19
1/26/2018	12:34:01 AM	201600	19
1/26/2018	12:39:01 AM	201900	19
1/26/2018	12:44:01 AM	202200	19.01
1/26/2018	12:49:01 AM	202500	19.01
1/26/2018	12:54:01 AM	202800	19
1/26/2018	12:59:01 AM	203100	19.01
1/26/2018	1:04:01 AM	203400	19
1/26/2018	1:09:01 AM	203700	19
1/26/2018	1:14:01 AM	204000	19
1/26/2018	1:19:01 AM	204300	19
1/26/2018	1:24:01 AM	204600	19
1/26/2018	1:29:01 AM	204900	19
1/26/2018	1:34:01 AM	205200	19
1/26/2018	1:39:01 AM	205500	19.01
1/26/2018	1:44:01 AM	205800	19
1/26/2018	1:49:01 AM	206100	19
1/26/2018	1:54:01 AM	206400	19.01
1/26/2018	1:59:01 AM	206700	19
1/26/2018	2:04:01 AM	207000	19
1/26/2018	2:09:01 AM	207300	18.99
1/26/2018	2:14:01 AM	207600	19
1/26/2018	2:19:01 AM	207900	19
1/26/2018	2:24:01 AM	208200	18.99
1/26/2018	2:29:01 AM	208500	19
1/26/2018	2:34:01 AM	208800	19
1/26/2018	2:39:01 AM	209100	18.99
1/26/2018	2:44:01 AM	209400	19
1/26/2018	2:49:01 AM	209700	19
1/26/2018	2:54:01 AM	210000	19
1/26/2018	2:59:01 AM	210300	18.99
1/26/2018	3:04:01 AM	210600	18.99
1/26/2018	3:09:01 AM	210900	18.99

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/26/2018	3:14:01 AM	211200	18.99
1/26/2018	3:19:01 AM	211500	18.99
1/26/2018	3:24:01 AM	211800	19
1/26/2018	3:29:01 AM	212100	18.99
1/26/2018	3:34:01 AM	212400	19
1/26/2018	3:39:01 AM	212700	19
1/26/2018	3:44:01 AM	213000	19
1/26/2018	3:49:01 AM	213300	18.99
1/26/2018	3:54:01 AM	213600	18.99
1/26/2018	3:59:01 AM	213900	18.99
1/26/2018	4:04:01 AM	214200	18.99
1/26/2018	4:09:01 AM	214500	18.99
1/26/2018	4:14:01 AM	214800	18.99
1/26/2018	4:19:01 AM	215100	18.99
1/26/2018	4:24:01 AM	215400	18.99
1/26/2018	4:29:01 AM	215700	18.99
1/26/2018	4:34:01 AM	216000	18.98
1/26/2018	4:39:01 AM	216300	18.99
1/26/2018	4:44:01 AM	216600	18.99
1/26/2018	4:49:01 AM	216900	18.99
1/26/2018	4:54:01 AM	217200	18.98
1/26/2018	4:59:01 AM	217500	18.99
1/26/2018	5:04:01 AM	217800	18.99
1/26/2018	5:09:01 AM	218100	18.99
1/26/2018	5:14:01 AM	218400	19
1/26/2018	5:19:01 AM	218700	19
1/26/2018	5:24:01 AM	219000	18.98
1/26/2018	5:29:01 AM	219300	18.99
1/26/2018	5:34:01 AM	219600	18.99
1/26/2018	5:39:01 AM	219900	18.98
1/26/2018	5:44:01 AM	220200	18.99
1/26/2018	5:49:01 AM	220500	18.98
1/26/2018	5:54:01 AM	220800	18.99
1/26/2018	5:59:01 AM	221100	18.99
1/26/2018	6:04:01 AM	221400	18.98
1/26/2018	6:09:01 AM	221700	18.99
1/26/2018	6:14:01 AM	222000	18.99
1/26/2018	6:19:01 AM	222300	18.99
1/26/2018	6:24:01 AM	222600	18.98
1/26/2018	6:29:01 AM	222900	18.99
1/26/2018	6:34:01 AM	223200	18.99
1/26/2018	6:39:01 AM	223500	18.98
1/26/2018	6:44:01 AM	223800	18.99
1/26/2018	6:49:01 AM	224100	18.99

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	
		(seconds)	MW08
1/26/2018	6:54:01 AM	224400	18.99
1/26/2018	6:59:01 AM	224700	18.99
1/26/2018	7:04:01 AM	225000	18.98
1/26/2018	7:09:01 AM	225300	19
1/26/2018	7:14:01 AM	225600	18.99
1/26/2018	7:19:01 AM	225900	18.99
1/26/2018	7:24:01 AM	226200	19
1/26/2018	7:29:01 AM	226500	19
1/26/2018	7:34:01 AM	226800	19
1/26/2018	7:39:01 AM	227100	19
1/26/2018	7:44:01 AM	227400	19
1/26/2018	7:49:01 AM	227700	19
1/26/2018	7:54:01 AM	228000	19
1/26/2018	7:59:01 AM	228300	19
1/26/2018	8:04:01 AM	228600	19.01
1/26/2018	8:09:01 AM	228900	19.01
1/26/2018	8:14:01 AM	229200	19.01
1/26/2018	8:19:01 AM	229500	19
1/26/2018	8:24:01 AM	229800	19.02
1/26/2018	8:29:01 AM	230100	19.04
1/26/2018	8:34:01 AM	230400	19.08
1/26/2018	8:39:01 AM	230700	19.1
1/26/2018	8:44:01 AM	231000	19
1/26/2018	8:49:01 AM	231300	19.03
1/26/2018	8:54:01 AM	231600	19.08
1/26/2018	8:59:01 AM	231900	19.1
1/26/2018	9:04:01 AM	232200	19.06
1/26/2018	9:09:01 AM	232500	19.1
1/26/2018	9:14:01 AM	232800	19.01
1/26/2018	9:19:01 AM	233100	18.94
1/26/2018	9:24:01 AM	233400	19.07
1/26/2018	9:29:01 AM	233700	18.97
1/26/2018	9:34:01 AM	234000	18.98
1/26/2018	9:39:01 AM	234300	19.01
1/26/2018	9:44:01 AM	234600	19.01
1/26/2018	9:49:01 AM	234900	19.01
1/26/2018	9:54:01 AM	235200	19.02
1/26/2018	9:59:01 AM	235500	19.02
1/26/2018	10:04:01 AM	235800	19.02
1/26/2018	10:09:01 AM	236100	19.01
1/26/2018	10:14:01 AM	236400	19
1/26/2018	10:19:01 AM	236700	19.01
1/26/2018	10:24:01 AM	237000	19.03
1/26/2018	10:29:01 AM	237300	19.02

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time (seconds)	MW08
1/26/2018	10:34:01 AM	237600	19
1/26/2018	10:39:01 AM	237900	19.16
1/26/2018	10:44:01 AM	238200	18.97
1/26/2018	10:49:01 AM	238500	18.99
1/26/2018	10:54:01 AM	238800	19.02
1/26/2018	10:59:01 AM	239100	19.01
1/26/2018	11:04:01 AM	239400	19.03
1/26/2018	11:09:01 AM	239700	19
1/26/2018	11:14:01 AM	240000	18.98
1/26/2018	11:19:01 AM	240300	19.01
1/26/2018	11:24:01 AM	240600	18.97
1/26/2018	11:29:01 AM	240900	19.03
1/26/2018	11:34:01 AM	241200	19.02
1/26/2018	11:39:01 AM	241500	18.95
1/26/2018	11:44:01 AM	241800	19.03
1/26/2018	11:49:01 AM	242100	19.16
1/26/2018	11:54:01 AM	242400	19.05
1/26/2018	11:59:01 AM	242700	18.96
1/26/2018	12:04:01 PM	243000	18.98
1/26/2018	12:09:01 PM	243300	18.91
1/26/2018	12:14:01 PM	243600	18.98
1/26/2018	12:19:01 PM	243900	19.04
1/26/2018	12:24:01 PM	244200	19.16
1/26/2018	12:29:01 PM	244500	19.06
1/26/2018	12:34:01 PM	244800	19.01
1/26/2018	12:39:01 PM	245100	19.02
1/26/2018	12:44:01 PM	245400	18.98
1/26/2018	12:49:01 PM	245700	19.01
1/26/2018	12:54:01 PM	246000	18.99
1/26/2018	12:59:01 PM	246300	19.01
1/26/2018	1:04:01 PM	246600	19.01
1/26/2018	1:09:01 PM	246900	19.01
1/26/2018	1:14:01 PM	247200	18.99
1/26/2018	1:19:01 PM	247500	18.99
1/26/2018	1:24:01 PM	247800	19.01
1/26/2018	1:29:01 PM	248100	18.98
1/26/2018	1:34:01 PM	248400	19.01
1/26/2018	1:39:01 PM	248700	18.93
1/26/2018	1:44:01 PM	249000	18.93
1/26/2018	1:49:01 PM	249300	18.96
1/26/2018	1:54:01 PM	249600	18.97
1/26/2018	1:59:01 PM	249900	18.97
1/26/2018	2:04:01 PM	250200	18.97
1/26/2018	2:09:01 PM	250500	18.98

MW08 Constant Rate.xlsm

Date	Time	Elapsed Time	MW08
		(seconds)	
1/26/2018	2:14:01 PM	250800	18.98
1/26/2018	2:19:01 PM	251100	18.97
1/26/2018	2:24:01 PM	251400	18.96
1/26/2018	2:29:01 PM	251700	18.94
1/26/2018	2:34:01 PM	252000	18.97
1/26/2018	2:39:01 PM	252300	18.98
1/26/2018	2:44:01 PM	252600	18.98
1/26/2018	2:49:01 PM	252900	18.97
1/26/2018	2:54:01 PM	253200	18.95
1/26/2018	2:59:01 PM	253500	18.95
1/26/2018	3:04:01 PM	253800	18.97
1/26/2018	3:09:01 PM	254100	18.98
1/26/2018	3:14:01 PM	254400	18.96
1/26/2018	3:19:01 PM	254700	18.96
1/26/2018	3:24:01 PM	255000	18.97
1/26/2018	3:29:01 PM	255300	18.99
1/26/2018	3:34:01 PM	255600	18.95
1/26/2018	3:39:01 PM	255900	18.96
1/26/2018	3:44:01 PM	256200	18.96
1/26/2018	3:49:01 PM	256500	18.97
1/26/2018	3:54:01 PM	256800	18.94
1/26/2018	3:59:01 PM	257100	18.97
1/26/2018	4:04:01 PM	257400	18.95
1/26/2018	4:09:01 PM	257700	18.94
1/26/2018	4:14:01 PM	258000	18.92
1/26/2018	4:19:01 PM	258300	18.93
1/26/2018	4:24:01 PM	258600	18.92
1/26/2018	4:29:01 PM	258900	18.93
1/26/2018	4:34:01 PM	259200	18.93
1/26/2018	4:39:01 PM	259500	18.93
1/26/2018	4:44:01 PM	259800	18.94
1/26/2018	4:49:01 PM	260100	18.93
1/26/2018	4:54:01 PM	260400	18.93
1/26/2018	4:59:01 PM	260700	18.93
1/26/2018	5:03:04 PM	260943	18.92

RECOVERY TEST DATA

17PZ01 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	17PZ01
1/26/2018	5:23:22 PM	0	9.82
1/26/2018	5:28:22 PM	300	9.83
1/26/2018	5:33:22 PM	600	9.82
1/26/2018	5:38:22 PM	900	9.82
1/26/2018	5:43:22 PM	1200	9.81
1/26/2018	5:48:22 PM	1500	9.8
1/26/2018	5:53:22 PM	1800	9.79
1/26/2018	5:58:22 PM	2100	9.79
1/26/2018	6:03:22 PM	2400	9.78
1/26/2018	6:08:22 PM	2700	9.77
1/26/2018	6:13:22 PM	3000	9.76
1/26/2018	6:18:22 PM	3300	9.74
1/26/2018	6:23:22 PM	3600	9.73
1/26/2018	6:28:22 PM	3900	9.73
1/26/2018	6:33:22 PM	4200	9.72
1/26/2018	6:38:22 PM	4500	9.71
1/26/2018	6:43:22 PM	4800	9.7
1/26/2018	6:48:22 PM	5100	9.7
1/26/2018	6:53:22 PM	5400	9.69
1/26/2018	6:58:22 PM	5700	9.69
1/26/2018	7:03:22 PM	6000	9.68
1/26/2018	7:08:22 PM	6300	9.68
1/26/2018	7:13:22 PM	6600	9.67
1/26/2018	7:18:22 PM	6900	9.67
1/26/2018	7:23:22 PM	7200	9.66
1/26/2018	7:28:22 PM	7500	9.66
1/26/2018	7:33:22 PM	7800	9.66
1/26/2018	7:38:22 PM	8100	9.65
1/26/2018	7:43:22 PM	8400	9.65
1/26/2018	7:48:22 PM	8700	9.64
1/26/2018	7:53:22 PM	9000	9.65
1/26/2018	7:58:22 PM	9300	9.63
1/26/2018	8:03:22 PM	9600	9.64
1/26/2018	8:08:22 PM	9900	9.63
1/26/2018	8:13:22 PM	10200	9.62
1/26/2018	8:18:22 PM	10500	9.63
1/26/2018	8:23:22 PM	10800	9.62
1/26/2018	8:28:22 PM	11100	9.62
1/26/2018	8:33:22 PM	11400	9.62
1/26/2018	8:38:22 PM	11700	9.62
1/26/2018	8:43:22 PM	12000	9.61
1/26/2018	8:48:22 PM	12300	9.61
1/26/2018	8:53:22 PM	12600	9.61
1/26/2018	8:58:22 PM	12900	9.61
1/26/2018	9:03:22 PM	13200	9.61

17PZ01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ01
1/26/2018	9:08:22 PM	13500	9.6
1/26/2018	9:13:22 PM	13800	9.6
1/26/2018	9:18:22 PM	14100	9.6
1/26/2018	9:23:22 PM	14400	9.6
1/26/2018	9:28:22 PM	14700	9.6
1/26/2018	9:33:22 PM	15000	9.6
1/26/2018	9:38:22 PM	15300	9.6
1/26/2018	9:43:22 PM	15600	9.59
1/26/2018	9:48:22 PM	15900	9.59
1/26/2018	9:53:22 PM	16200	9.59
1/26/2018	9:58:22 PM	16500	9.59
1/26/2018	10:03:22 PM	16800	9.58
1/26/2018	10:08:22 PM	17100	9.58
1/26/2018	10:13:22 PM	17400	9.58
1/26/2018	10:18:22 PM	17700	9.58
1/26/2018	10:23:22 PM	18000	9.58
1/26/2018	10:28:22 PM	18300	9.58
1/26/2018	10:33:22 PM	18600	9.57
1/26/2018	10:38:22 PM	18900	9.57
1/26/2018	10:43:22 PM	19200	9.57
1/26/2018	10:48:22 PM	19500	9.57
1/26/2018	10:53:22 PM	19800	9.57
1/26/2018	10:58:22 PM	20100	9.57
1/26/2018	11:03:22 PM	20400	9.57
1/26/2018	11:08:22 PM	20700	9.56
1/26/2018	11:13:22 PM	21000	9.56
1/26/2018	11:18:22 PM	21300	9.55
1/26/2018	11:23:22 PM	21600	9.56
1/26/2018	11:28:22 PM	21900	9.56
1/26/2018	11:33:22 PM	22200	9.56
1/26/2018	11:38:22 PM	22500	9.56
1/26/2018	11:43:22 PM	22800	9.56
1/26/2018	11:48:22 PM	23100	9.55
1/26/2018	11:53:22 PM	23400	9.55
1/26/2018	11:58:22 PM	23700	9.55
1/27/2018	12:03:22 AM	24000	9.55
1/27/2018	12:08:22 AM	24300	9.55
1/27/2018	12:13:22 AM	24600	9.54
1/27/2018	12:18:22 AM	24900	9.54
1/27/2018	12:23:22 AM	25200	9.54
1/27/2018	12:28:22 AM	25500	9.54
1/27/2018	12:33:22 AM	25800	9.54
1/27/2018	12:38:22 AM	26100	9.54
1/27/2018	12:43:22 AM	26400	9.54
1/27/2018	12:48:22 AM	26700	9.53

17PZ01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ01
1/27/2018	12:53:22 AM	27000	9.53
1/27/2018	12:58:22 AM	27300	9.53
1/27/2018	1:03:22 AM	27600	9.53
1/27/2018	1:08:22 AM	27900	9.53
1/27/2018	1:13:22 AM	28200	9.53
1/27/2018	1:18:22 AM	28500	9.53
1/27/2018	1:23:22 AM	28800	9.52
1/27/2018	1:28:22 AM	29100	9.52
1/27/2018	1:33:22 AM	29400	9.52
1/27/2018	1:38:22 AM	29700	9.52
1/27/2018	1:43:22 AM	30000	9.52
1/27/2018	1:48:22 AM	30300	9.51
1/27/2018	1:53:22 AM	30600	9.52
1/27/2018	1:58:22 AM	30900	9.51
1/27/2018	2:03:22 AM	31200	9.51
1/27/2018	2:08:22 AM	31500	9.52
1/27/2018	2:13:22 AM	31800	9.51
1/27/2018	2:18:22 AM	32100	9.51
1/27/2018	2:23:22 AM	32400	9.51
1/27/2018	2:28:22 AM	32700	9.51
1/27/2018	2:33:22 AM	33000	9.51
1/27/2018	2:38:22 AM	33300	9.51
1/27/2018	2:43:22 AM	33600	9.51
1/27/2018	2:48:22 AM	33900	9.5
1/27/2018	2:53:22 AM	34200	9.5
1/27/2018	2:58:22 AM	34500	9.5
1/27/2018	3:03:22 AM	34800	9.5
1/27/2018	3:08:22 AM	35100	9.5
1/27/2018	3:13:22 AM	35400	9.5
1/27/2018	3:18:22 AM	35700	9.5
1/27/2018	3:23:22 AM	36000	9.5
1/27/2018	3:28:22 AM	36300	9.49
1/27/2018	3:33:22 AM	36600	9.5
1/27/2018	3:38:22 AM	36900	9.49
1/27/2018	3:43:22 AM	37200	9.49
1/27/2018	3:48:22 AM	37500	9.49
1/27/2018	3:53:22 AM	37800	9.49
1/27/2018	3:58:22 AM	38100	9.49
1/27/2018	4:03:22 AM	38400	9.49
1/27/2018	4:08:22 AM	38700	9.48
1/27/2018	4:13:22 AM	39000	9.48
1/27/2018	4:18:22 AM	39300	9.48
1/27/2018	4:23:22 AM	39600	9.48
1/27/2018	4:28:22 AM	39900	9.48
1/27/2018	4:33:22 AM	40200	9.48

17PZ01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ01
1/27/2018	4:38:22 AM	40500	9.48
1/27/2018	4:43:22 AM	40800	9.48
1/27/2018	4:48:22 AM	41100	9.47
1/27/2018	4:53:22 AM	41400	9.47
1/27/2018	4:58:22 AM	41700	9.48
1/27/2018	5:03:22 AM	42000	9.48
1/27/2018	5:08:22 AM	42300	9.47
1/27/2018	5:13:22 AM	42600	9.48
1/27/2018	5:18:22 AM	42900	9.48
1/27/2018	5:23:22 AM	43200	9.48
1/27/2018	5:28:22 AM	43500	9.48
1/27/2018	5:33:22 AM	43800	9.47
1/27/2018	5:38:22 AM	44100	9.47
1/27/2018	5:43:22 AM	44400	9.47
1/27/2018	5:48:22 AM	44700	9.47
1/27/2018	5:53:22 AM	45000	9.48
1/27/2018	5:58:22 AM	45300	9.47
1/27/2018	6:03:22 AM	45600	9.47
1/27/2018	6:08:22 AM	45900	9.47
1/27/2018	6:13:22 AM	46200	9.47
1/27/2018	6:18:22 AM	46500	9.47
1/27/2018	6:23:22 AM	46800	9.47
1/27/2018	6:28:22 AM	47100	9.47
1/27/2018	6:33:22 AM	47400	9.47
1/27/2018	6:38:22 AM	47700	9.47
1/27/2018	6:43:22 AM	48000	9.47
1/27/2018	6:48:22 AM	48300	9.47
1/27/2018	6:53:22 AM	48600	9.46
1/27/2018	6:58:22 AM	48900	9.47
1/27/2018	7:03:22 AM	49200	9.47
1/27/2018	7:08:22 AM	49500	9.47
1/27/2018	7:13:22 AM	49800	9.46
1/27/2018	7:18:22 AM	50100	9.47
1/27/2018	7:23:22 AM	50400	9.47
1/27/2018	7:28:22 AM	50700	9.47
1/27/2018	7:33:22 AM	51000	9.47
1/27/2018	7:38:22 AM	51300	9.46
1/27/2018	7:43:22 AM	51600	9.46
1/27/2018	7:48:22 AM	51900	9.47
1/27/2018	7:53:22 AM	52200	9.46
1/27/2018	7:58:22 AM	52500	9.46
1/27/2018	8:03:22 AM	52800	9.46
1/27/2018	8:08:22 AM	53100	9.46
1/27/2018	8:13:22 AM	53400	9.46
1/27/2018	8:18:22 AM	53700	9.46

17PZ01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ01
1/27/2018	8:23:22 AM	54000	9.46
1/27/2018	8:28:22 AM	54300	9.46
1/27/2018	8:33:22 AM	54600	9.46
1/27/2018	8:38:22 AM	54900	9.46
1/27/2018	8:43:22 AM	55200	9.46
1/27/2018	8:48:22 AM	55500	9.48
1/27/2018	8:53:22 AM	55800	9.46
1/27/2018	8:58:22 AM	56100	9.46
1/27/2018	9:03:22 AM	56400	9.46
1/27/2018	9:08:22 AM	56700	9.46
1/27/2018	9:13:22 AM	57000	9.46
1/27/2018	9:18:22 AM	57300	9.46
1/27/2018	9:19:55 AM	57393	9.46

17PZ02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/26/2018	5:23:22 PM	0	10.36
1/26/2018	5:28:22 PM	300	10.35
1/26/2018	5:33:22 PM	600	10.36
1/26/2018	5:38:22 PM	900	10.36
1/26/2018	5:43:22 PM	1200	10.35
1/26/2018	5:48:22 PM	1500	10.35
1/26/2018	5:53:22 PM	1800	10.34
1/26/2018	5:58:22 PM	2100	10.34
1/26/2018	6:03:22 PM	2400	10.33
1/26/2018	6:08:22 PM	2700	10.32
1/26/2018	6:13:22 PM	3000	10.32
1/26/2018	6:18:22 PM	3300	10.3
1/26/2018	6:23:22 PM	3600	10.29
1/26/2018	6:28:22 PM	3900	10.29
1/26/2018	6:33:22 PM	4200	10.28
1/26/2018	6:38:22 PM	4500	10.28
1/26/2018	6:43:22 PM	4800	10.27
1/26/2018	6:48:22 PM	5100	10.27
1/26/2018	6:53:22 PM	5400	10.26
1/26/2018	6:58:22 PM	5700	10.25
1/26/2018	7:03:22 PM	6000	10.25
1/26/2018	7:08:22 PM	6300	10.25
1/26/2018	7:13:22 PM	6600	10.24
1/26/2018	7:18:22 PM	6900	10.23
1/26/2018	7:23:22 PM	7200	10.23
1/26/2018	7:28:22 PM	7500	10.23
1/26/2018	7:33:22 PM	7800	10.23
1/26/2018	7:38:22 PM	8100	10.22
1/26/2018	7:43:22 PM	8400	10.22
1/26/2018	7:48:22 PM	8700	10.22
1/26/2018	7:53:22 PM	9000	10.21
1/26/2018	7:58:22 PM	9300	10.21
1/26/2018	8:03:22 PM	9600	10.21
1/26/2018	8:08:22 PM	9900	10.2
1/26/2018	8:13:22 PM	10200	10.2
1/26/2018	8:18:22 PM	10500	10.19
1/26/2018	8:23:22 PM	10800	10.19
1/26/2018	8:28:22 PM	11100	10.19
1/26/2018	8:33:22 PM	11400	10.18
1/26/2018	8:38:22 PM	11700	10.19
1/26/2018	8:43:22 PM	12000	10.19
1/26/2018	8:48:22 PM	12300	10.18
1/26/2018	8:53:22 PM	12600	10.18
1/26/2018	8:58:22 PM	12900	10.17
1/26/2018	9:03:22 PM	13200	10.17

17PZ02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/26/2018	9:08:22 PM	13500	10.17
1/26/2018	9:13:22 PM	13800	10.17
1/26/2018	9:18:22 PM	14100	10.16
1/26/2018	9:23:22 PM	14400	10.17
1/26/2018	9:28:22 PM	14700	10.16
1/26/2018	9:33:22 PM	15000	10.16
1/26/2018	9:38:22 PM	15300	10.16
1/26/2018	9:43:22 PM	15600	10.16
1/26/2018	9:48:22 PM	15900	10.16
1/26/2018	9:53:22 PM	16200	10.16
1/26/2018	9:58:22 PM	16500	10.15
1/26/2018	10:03:22 PM	16800	10.15
1/26/2018	10:08:22 PM	17100	10.14
1/26/2018	10:13:22 PM	17400	10.15
1/26/2018	10:18:22 PM	17700	10.14
1/26/2018	10:23:22 PM	18000	10.15
1/26/2018	10:28:22 PM	18300	10.14
1/26/2018	10:33:22 PM	18600	10.14
1/26/2018	10:38:22 PM	18900	10.14
1/26/2018	10:43:22 PM	19200	10.14
1/26/2018	10:48:22 PM	19500	10.14
1/26/2018	10:53:22 PM	19800	10.14
1/26/2018	10:58:22 PM	20100	10.14
1/26/2018	11:03:22 PM	20400	10.14
1/26/2018	11:08:22 PM	20700	10.13
1/26/2018	11:13:22 PM	21000	10.13
1/26/2018	11:18:22 PM	21300	10.13
1/26/2018	11:23:22 PM	21600	10.13
1/26/2018	11:28:22 PM	21900	10.13
1/26/2018	11:33:22 PM	22200	10.13
1/26/2018	11:38:22 PM	22500	10.12
1/26/2018	11:43:22 PM	22800	10.13
1/26/2018	11:48:22 PM	23100	10.12
1/26/2018	11:53:22 PM	23400	10.12
1/26/2018	11:58:22 PM	23700	10.12
1/27/2018	12:03:22 AM	24000	10.11
1/27/2018	12:08:22 AM	24300	10.11
1/27/2018	12:13:22 AM	24600	10.11
1/27/2018	12:18:22 AM	24900	10.11
1/27/2018	12:23:22 AM	25200	10.11
1/27/2018	12:28:22 AM	25500	10.1
1/27/2018	12:33:22 AM	25800	10.1
1/27/2018	12:38:22 AM	26100	10.11
1/27/2018	12:43:22 AM	26400	10.1
1/27/2018	12:48:22 AM	26700	10.1

17PZ02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/27/2018	12:53:22 AM	27000	10.1
1/27/2018	12:58:22 AM	27300	10.1
1/27/2018	1:03:22 AM	27600	10.09
1/27/2018	1:08:22 AM	27900	10.09
1/27/2018	1:13:22 AM	28200	10.09
1/27/2018	1:18:22 AM	28500	10.09
1/27/2018	1:23:22 AM	28800	10.09
1/27/2018	1:28:22 AM	29100	10.08
1/27/2018	1:33:22 AM	29400	10.08
1/27/2018	1:38:22 AM	29700	10.09
1/27/2018	1:43:22 AM	30000	10.09
1/27/2018	1:48:22 AM	30300	10.08
1/27/2018	1:53:22 AM	30600	10.08
1/27/2018	1:58:22 AM	30900	10.08
1/27/2018	2:03:22 AM	31200	10.08
1/27/2018	2:08:22 AM	31500	10.08
1/27/2018	2:13:22 AM	31800	10.08
1/27/2018	2:18:22 AM	32100	10.08
1/27/2018	2:23:22 AM	32400	10.07
1/27/2018	2:28:22 AM	32700	10.07
1/27/2018	2:33:22 AM	33000	10.07
1/27/2018	2:38:22 AM	33300	10.07
1/27/2018	2:43:22 AM	33600	10.07
1/27/2018	2:48:22 AM	33900	10.07
1/27/2018	2:53:22 AM	34200	10.07
1/27/2018	2:58:22 AM	34500	10.06
1/27/2018	3:03:22 AM	34800	10.07
1/27/2018	3:08:22 AM	35100	10.07
1/27/2018	3:13:22 AM	35400	10.06
1/27/2018	3:18:22 AM	35700	10.06
1/27/2018	3:23:22 AM	36000	10.07
1/27/2018	3:28:22 AM	36300	10.06
1/27/2018	3:33:22 AM	36600	10.06
1/27/2018	3:38:22 AM	36900	10.06
1/27/2018	3:43:22 AM	37200	10.06
1/27/2018	3:48:22 AM	37500	10.05
1/27/2018	3:53:22 AM	37800	10.05
1/27/2018	3:58:22 AM	38100	10.05
1/27/2018	4:03:22 AM	38400	10.06
1/27/2018	4:08:22 AM	38700	10.05
1/27/2018	4:13:22 AM	39000	10.05
1/27/2018	4:18:22 AM	39300	10.05
1/27/2018	4:23:22 AM	39600	10.04
1/27/2018	4:28:22 AM	39900	10.04
1/27/2018	4:33:22 AM	40200	10.05

17PZ02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/27/2018	4:38:22 AM	40500	10.04
1/27/2018	4:43:22 AM	40800	10.04
1/27/2018	4:48:22 AM	41100	10.05
1/27/2018	4:53:22 AM	41400	10.04
1/27/2018	4:58:22 AM	41700	10.04
1/27/2018	5:03:22 AM	42000	10.04
1/27/2018	5:08:22 AM	42300	10.04
1/27/2018	5:13:22 AM	42600	10.04
1/27/2018	5:18:22 AM	42900	10.05
1/27/2018	5:23:22 AM	43200	10.04
1/27/2018	5:28:22 AM	43500	10.04
1/27/2018	5:33:22 AM	43800	10.04
1/27/2018	5:38:22 AM	44100	10.04
1/27/2018	5:43:22 AM	44400	10.04
1/27/2018	5:48:22 AM	44700	10.04
1/27/2018	5:53:22 AM	45000	10.03
1/27/2018	5:58:22 AM	45300	10.03
1/27/2018	6:03:22 AM	45600	10.03
1/27/2018	6:08:22 AM	45900	10.03
1/27/2018	6:13:22 AM	46200	10.03
1/27/2018	6:18:22 AM	46500	10.04
1/27/2018	6:23:22 AM	46800	10.03
1/27/2018	6:28:22 AM	47100	10.04
1/27/2018	6:33:22 AM	47400	10.04
1/27/2018	6:38:22 AM	47700	10.03
1/27/2018	6:43:22 AM	48000	10.03
1/27/2018	6:48:22 AM	48300	10.04
1/27/2018	6:53:22 AM	48600	10.03
1/27/2018	6:58:22 AM	48900	10.03
1/27/2018	7:03:22 AM	49200	10.03
1/27/2018	7:08:22 AM	49500	10.03
1/27/2018	7:13:22 AM	49800	10.03
1/27/2018	7:18:22 AM	50100	10.03
1/27/2018	7:23:22 AM	50400	10.03
1/27/2018	7:28:22 AM	50700	10.03
1/27/2018	7:33:22 AM	51000	10.03
1/27/2018	7:38:22 AM	51300	10.03
1/27/2018	7:43:22 AM	51600	10.03
1/27/2018	7:48:22 AM	51900	10.02
1/27/2018	7:53:22 AM	52200	10.03
1/27/2018	7:58:22 AM	52500	10.02
1/27/2018	8:03:22 AM	52800	10.02
1/27/2018	8:08:22 AM	53100	10.02
1/27/2018	8:13:22 AM	53400	10.03
1/27/2018	8:18:22 AM	53700	10.02

17PZ02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ02
1/27/2018	8:23:22 AM	54000	10.02
1/27/2018	8:28:22 AM	54300	10.03
1/27/2018	8:33:22 AM	54600	10.02
1/27/2018	8:38:22 AM	54900	10.03
1/27/2018	8:43:22 AM	55200	10.02
1/27/2018	8:48:22 AM	55500	10.08
1/27/2018	8:53:22 AM	55800	10.02
1/27/2018	8:58:22 AM	56100	10.02
1/27/2018	9:03:22 AM	56400	10.02
1/27/2018	9:08:22 AM	56700	10.02
1/27/2018	9:13:22 AM	57000	10.02
1/27/2018	9:18:22 AM	57300	10.02
1/27/2018	9:19:55 AM	57393	10.02

17PZ03 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	5:23:22 PM	0	10.06
1/26/2018	5:28:22 PM	300	10.07
1/26/2018	5:33:22 PM	600	10.07
1/26/2018	5:38:22 PM	900	10.08
1/26/2018	5:43:22 PM	1200	10.07
1/26/2018	5:48:22 PM	1500	10.07
1/26/2018	5:53:22 PM	1800	10.07
1/26/2018	5:58:22 PM	2100	10.07
1/26/2018	6:03:22 PM	2400	10.07
1/26/2018	6:08:22 PM	2700	10.07
1/26/2018	6:13:22 PM	3000	10.07
1/26/2018	6:18:22 PM	3300	10.07
1/26/2018	6:23:22 PM	3600	10.07
1/26/2018	6:28:22 PM	3900	10.07
1/26/2018	6:33:22 PM	4200	10.07
1/26/2018	6:38:22 PM	4500	10.07
1/26/2018	6:43:22 PM	4800	10.07
1/26/2018	6:48:22 PM	5100	10.06
1/26/2018	6:53:22 PM	5400	10.06
1/26/2018	6:58:22 PM	5700	10.06
1/26/2018	7:03:22 PM	6000	10.06
1/26/2018	7:08:22 PM	6300	10.06
1/26/2018	7:13:22 PM	6600	10.06
1/26/2018	7:18:22 PM	6900	10.05
1/26/2018	7:23:22 PM	7200	10.05
1/26/2018	7:28:22 PM	7500	10.05
1/26/2018	7:33:22 PM	7800	10.05
1/26/2018	7:38:22 PM	8100	10.04
1/26/2018	7:43:22 PM	8400	10.04
1/26/2018	7:48:22 PM	8700	10.04
1/26/2018	7:53:22 PM	9000	10.04
1/26/2018	7:58:22 PM	9300	10.04
1/26/2018	8:03:22 PM	9600	10.04
1/26/2018	8:08:22 PM	9900	10.03
1/26/2018	8:13:22 PM	10200	10.03
1/26/2018	8:18:22 PM	10500	10.03
1/26/2018	8:23:22 PM	10800	10.02
1/26/2018	8:28:22 PM	11100	10.02
1/26/2018	8:33:22 PM	11400	10.02
1/26/2018	8:38:22 PM	11700	10.02
1/26/2018	8:43:22 PM	12000	10.02
1/26/2018	8:48:22 PM	12300	10.02
1/26/2018	8:53:22 PM	12600	10.02
1/26/2018	8:58:22 PM	12900	10.01
1/26/2018	9:03:22 PM	13200	10.01

17PZ03 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/26/2018	9:08:22 PM	13500	10.01
1/26/2018	9:13:22 PM	13800	10.01
1/26/2018	9:18:22 PM	14100	10.01
1/26/2018	9:23:22 PM	14400	10.01
1/26/2018	9:28:22 PM	14700	10.01
1/26/2018	9:33:22 PM	15000	10.01
1/26/2018	9:38:22 PM	15300	10
1/26/2018	9:43:22 PM	15600	10
1/26/2018	9:48:22 PM	15900	10.01
1/26/2018	9:53:22 PM	16200	10
1/26/2018	9:58:22 PM	16500	10
1/26/2018	10:03:22 PM	16800	10.01
1/26/2018	10:08:22 PM	17100	10
1/26/2018	10:13:22 PM	17400	10
1/26/2018	10:18:22 PM	17700	10
1/26/2018	10:23:22 PM	18000	10
1/26/2018	10:28:22 PM	18300	9.99
1/26/2018	10:33:22 PM	18600	9.99
1/26/2018	10:38:22 PM	18900	9.99
1/26/2018	10:43:22 PM	19200	9.99
1/26/2018	10:48:22 PM	19500	9.99
1/26/2018	10:53:22 PM	19800	9.98
1/26/2018	10:58:22 PM	20100	9.98
1/26/2018	11:03:22 PM	20400	9.98
1/26/2018	11:08:22 PM	20700	9.98
1/26/2018	11:13:22 PM	21000	9.98
1/26/2018	11:18:22 PM	21300	9.98
1/26/2018	11:23:22 PM	21600	9.98
1/26/2018	11:28:22 PM	21900	9.98
1/26/2018	11:33:22 PM	22200	9.98
1/26/2018	11:38:22 PM	22500	9.98
1/26/2018	11:43:22 PM	22800	9.97
1/26/2018	11:48:22 PM	23100	9.97
1/26/2018	11:53:22 PM	23400	9.97
1/26/2018	11:58:22 PM	23700	9.98
1/27/2018	12:03:22 AM	24000	9.97
1/27/2018	12:08:22 AM	24300	9.97
1/27/2018	12:13:22 AM	24600	9.96
1/27/2018	12:18:22 AM	24900	9.96
1/27/2018	12:23:22 AM	25200	9.97
1/27/2018	12:28:22 AM	25500	9.96
1/27/2018	12:33:22 AM	25800	9.96
1/27/2018	12:38:22 AM	26100	9.96
1/27/2018	12:43:22 AM	26400	9.96
1/27/2018	12:48:22 AM	26700	9.96

17PZ03 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/27/2018	12:53:22 AM	27000	9.96
1/27/2018	12:58:22 AM	27300	9.95
1/27/2018	1:03:22 AM	27600	9.95
1/27/2018	1:08:22 AM	27900	9.95
1/27/2018	1:13:22 AM	28200	9.96
1/27/2018	1:18:22 AM	28500	9.95
1/27/2018	1:23:22 AM	28800	9.95
1/27/2018	1:28:22 AM	29100	9.95
1/27/2018	1:33:22 AM	29400	9.95
1/27/2018	1:38:22 AM	29700	9.95
1/27/2018	1:43:22 AM	30000	9.95
1/27/2018	1:48:22 AM	30300	9.94
1/27/2018	1:53:22 AM	30600	9.95
1/27/2018	1:58:22 AM	30900	9.94
1/27/2018	2:03:22 AM	31200	9.94
1/27/2018	2:08:22 AM	31500	9.94
1/27/2018	2:13:22 AM	31800	9.94
1/27/2018	2:18:22 AM	32100	9.94
1/27/2018	2:23:22 AM	32400	9.93
1/27/2018	2:28:22 AM	32700	9.94
1/27/2018	2:33:22 AM	33000	9.94
1/27/2018	2:38:22 AM	33300	9.93
1/27/2018	2:43:22 AM	33600	9.94
1/27/2018	2:48:22 AM	33900	9.93
1/27/2018	2:53:22 AM	34200	9.93
1/27/2018	2:58:22 AM	34500	9.93
1/27/2018	3:03:22 AM	34800	9.93
1/27/2018	3:08:22 AM	35100	9.93
1/27/2018	3:13:22 AM	35400	9.93
1/27/2018	3:18:22 AM	35700	9.93
1/27/2018	3:23:22 AM	36000	9.93
1/27/2018	3:28:22 AM	36300	9.93
1/27/2018	3:33:22 AM	36600	9.92
1/27/2018	3:38:22 AM	36900	9.92
1/27/2018	3:43:22 AM	37200	9.92
1/27/2018	3:48:22 AM	37500	9.92
1/27/2018	3:53:22 AM	37800	9.92
1/27/2018	3:58:22 AM	38100	9.92
1/27/2018	4:03:22 AM	38400	9.92
1/27/2018	4:08:22 AM	38700	9.92
1/27/2018	4:13:22 AM	39000	9.91
1/27/2018	4:18:22 AM	39300	9.91
1/27/2018	4:23:22 AM	39600	9.92
1/27/2018	4:28:22 AM	39900	9.91
1/27/2018	4:33:22 AM	40200	9.91

17PZ03 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/27/2018	4:38:22 AM	40500	9.91
1/27/2018	4:43:22 AM	40800	9.91
1/27/2018	4:48:22 AM	41100	9.91
1/27/2018	4:53:22 AM	41400	9.91
1/27/2018	4:58:22 AM	41700	9.91
1/27/2018	5:03:22 AM	42000	9.91
1/27/2018	5:08:22 AM	42300	9.9
1/27/2018	5:13:22 AM	42600	9.91
1/27/2018	5:18:22 AM	42900	9.91
1/27/2018	5:23:22 AM	43200	9.91
1/27/2018	5:28:22 AM	43500	9.91
1/27/2018	5:33:22 AM	43800	9.91
1/27/2018	5:38:22 AM	44100	9.91
1/27/2018	5:43:22 AM	44400	9.91
1/27/2018	5:48:22 AM	44700	9.9
1/27/2018	5:53:22 AM	45000	9.91
1/27/2018	5:58:22 AM	45300	9.91
1/27/2018	6:03:22 AM	45600	9.9
1/27/2018	6:08:22 AM	45900	9.9
1/27/2018	6:13:22 AM	46200	9.9
1/27/2018	6:18:22 AM	46500	9.9
1/27/2018	6:23:22 AM	46800	9.9
1/27/2018	6:28:22 AM	47100	9.9
1/27/2018	6:33:22 AM	47400	9.9
1/27/2018	6:38:22 AM	47700	9.91
1/27/2018	6:43:22 AM	48000	9.91
1/27/2018	6:48:22 AM	48300	9.9
1/27/2018	6:53:22 AM	48600	9.9
1/27/2018	6:58:22 AM	48900	9.9
1/27/2018	7:03:22 AM	49200	9.9
1/27/2018	7:08:22 AM	49500	9.91
1/27/2018	7:13:22 AM	49800	9.9
1/27/2018	7:18:22 AM	50100	9.9
1/27/2018	7:23:22 AM	50400	9.91
1/27/2018	7:28:22 AM	50700	9.9
1/27/2018	7:33:22 AM	51000	9.9
1/27/2018	7:38:22 AM	51300	9.9
1/27/2018	7:43:22 AM	51600	9.9
1/27/2018	7:48:22 AM	51900	9.9
1/27/2018	7:53:22 AM	52200	9.9
1/27/2018	7:58:22 AM	52500	9.89
1/27/2018	8:03:22 AM	52800	9.89
1/27/2018	8:08:22 AM	53100	9.9
1/27/2018	8:13:22 AM	53400	9.9
1/27/2018	8:18:22 AM	53700	9.9

17PZ03 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17PZ03
1/27/2018	8:23:22 AM	54000	9.9
1/27/2018	8:28:22 AM	54300	9.9
1/27/2018	8:33:22 AM	54600	9.9
1/27/2018	8:38:22 AM	54900	9.9
1/27/2018	8:43:22 AM	55200	9.9
1/27/2018	8:48:22 AM	55500	9.92
1/27/2018	8:53:22 AM	55800	9.9
1/27/2018	8:58:22 AM	56100	9.9
1/27/2018	9:03:22 AM	56400	9.9
1/27/2018	9:08:22 AM	56700	9.9
1/27/2018	9:13:22 AM	57000	9.9
1/27/2018	9:18:22 AM	57300	9.9
1/27/2018	9:19:55 AM	57393	9.9

17WW01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/26/2018	5:23:22 PM	0	22.59
1/26/2018	5:28:22 PM	300	19.02
1/26/2018	5:33:22 PM	600	16.73
1/26/2018	5:38:22 PM	900	15.19
1/26/2018	5:43:22 PM	1200	14.18
1/26/2018	5:48:22 PM	1500	13.16
1/26/2018	5:53:22 PM	1800	12.49
1/26/2018	5:58:22 PM	2100	12.12
1/26/2018	6:03:22 PM	2400	11.92
1/26/2018	6:08:22 PM	2700	11.78
1/26/2018	6:13:22 PM	3000	11.7
1/26/2018	6:18:22 PM	3300	11.63
1/26/2018	6:23:22 PM	3600	11.59
1/26/2018	6:28:22 PM	3900	11.54
1/26/2018	6:33:22 PM	4200	11.51
1/26/2018	6:38:22 PM	4500	11.49
1/26/2018	6:43:22 PM	4800	11.46
1/26/2018	6:48:22 PM	5100	11.44
1/26/2018	6:53:22 PM	5400	11.41
1/26/2018	6:58:22 PM	5700	11.4
1/26/2018	7:03:22 PM	6000	11.39
1/26/2018	7:08:22 PM	6300	11.37
1/26/2018	7:13:22 PM	6600	11.35
1/26/2018	7:18:22 PM	6900	11.34
1/26/2018	7:23:22 PM	7200	11.33
1/26/2018	7:28:22 PM	7500	11.32
1/26/2018	7:33:22 PM	7800	11.32
1/26/2018	7:38:22 PM	8100	11.3
1/26/2018	7:43:22 PM	8400	11.3
1/26/2018	7:48:22 PM	8700	11.28
1/26/2018	7:53:22 PM	9000	11.27
1/26/2018	7:58:22 PM	9300	11.27
1/26/2018	8:03:22 PM	9600	11.27
1/26/2018	8:08:22 PM	9900	11.25
1/26/2018	8:13:22 PM	10200	11.26
1/26/2018	8:18:22 PM	10500	11.25
1/26/2018	8:23:22 PM	10800	11.24
1/26/2018	8:28:22 PM	11100	11.24
1/26/2018	8:33:22 PM	11400	11.23
1/26/2018	8:38:22 PM	11700	11.22
1/26/2018	8:43:22 PM	12000	11.22
1/26/2018	8:48:22 PM	12300	11.21
1/26/2018	8:53:22 PM	12600	11.21
1/26/2018	8:58:22 PM	12900	11.2
1/26/2018	9:03:22 PM	13200	11.2

17WW01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/26/2018	9:08:22 PM	13500	11.19
1/26/2018	9:13:22 PM	13800	11.19
1/26/2018	9:18:22 PM	14100	11.19
1/26/2018	9:23:22 PM	14400	11.19
1/26/2018	9:28:22 PM	14700	11.18
1/26/2018	9:33:22 PM	15000	11.18
1/26/2018	9:38:22 PM	15300	11.17
1/26/2018	9:43:22 PM	15600	11.18
1/26/2018	9:48:22 PM	15900	11.17
1/26/2018	9:53:22 PM	16200	11.17
1/26/2018	9:58:22 PM	16500	11.17
1/26/2018	10:03:22 PM	16800	11.17
1/26/2018	10:08:22 PM	17100	11.16
1/26/2018	10:13:22 PM	17400	11.16
1/26/2018	10:18:22 PM	17700	11.16
1/26/2018	10:23:22 PM	18000	11.16
1/26/2018	10:28:22 PM	18300	11.15
1/26/2018	10:33:22 PM	18600	11.15
1/26/2018	10:38:22 PM	18900	11.15
1/26/2018	10:43:22 PM	19200	11.15
1/26/2018	10:48:22 PM	19500	11.15
1/26/2018	10:53:22 PM	19800	11.14
1/26/2018	10:58:22 PM	20100	11.14
1/26/2018	11:03:22 PM	20400	11.13
1/26/2018	11:08:22 PM	20700	11.14
1/26/2018	11:13:22 PM	21000	11.13
1/26/2018	11:18:22 PM	21300	11.13
1/26/2018	11:23:22 PM	21600	11.13
1/26/2018	11:28:22 PM	21900	11.12
1/26/2018	11:33:22 PM	22200	11.13
1/26/2018	11:38:22 PM	22500	11.13
1/26/2018	11:43:22 PM	22800	11.13
1/26/2018	11:48:22 PM	23100	11.13
1/26/2018	11:53:22 PM	23400	11.12
1/26/2018	11:58:22 PM	23700	11.12
1/27/2018	12:03:22 AM	24000	11.13
1/27/2018	12:08:22 AM	24300	11.11
1/27/2018	12:13:22 AM	24600	11.12
1/27/2018	12:18:22 AM	24900	11.12
1/27/2018	12:23:22 AM	25200	11.11
1/27/2018	12:28:22 AM	25500	11.11
1/27/2018	12:33:22 AM	25800	11.11
1/27/2018	12:38:22 AM	26100	11.11
1/27/2018	12:43:22 AM	26400	11.11
1/27/2018	12:48:22 AM	26700	11.1

17WW01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/27/2018	12:53:22 AM	27000	11.1
1/27/2018	12:58:22 AM	27300	11.1
1/27/2018	1:03:22 AM	27600	11.1
1/27/2018	1:08:22 AM	27900	11.1
1/27/2018	1:13:22 AM	28200	11.1
1/27/2018	1:18:22 AM	28500	11.1
1/27/2018	1:23:22 AM	28800	11.09
1/27/2018	1:28:22 AM	29100	11.09
1/27/2018	1:33:22 AM	29400	11.09
1/27/2018	1:38:22 AM	29700	11.09
1/27/2018	1:43:22 AM	30000	11.09
1/27/2018	1:48:22 AM	30300	11.09
1/27/2018	1:53:22 AM	30600	11.09
1/27/2018	1:58:22 AM	30900	11.08
1/27/2018	2:03:22 AM	31200	11.07
1/27/2018	2:08:22 AM	31500	11.08
1/27/2018	2:13:22 AM	31800	11.08
1/27/2018	2:18:22 AM	32100	11.08
1/27/2018	2:23:22 AM	32400	11.08
1/27/2018	2:28:22 AM	32700	11.08
1/27/2018	2:33:22 AM	33000	11.08
1/27/2018	2:38:22 AM	33300	11.08
1/27/2018	2:43:22 AM	33600	11.08
1/27/2018	2:48:22 AM	33900	11.08
1/27/2018	2:53:22 AM	34200	11.07
1/27/2018	2:58:22 AM	34500	11.07
1/27/2018	3:03:22 AM	34800	11.07
1/27/2018	3:08:22 AM	35100	11.07
1/27/2018	3:13:22 AM	35400	11.07
1/27/2018	3:18:22 AM	35700	11.07
1/27/2018	3:23:22 AM	36000	11.07
1/27/2018	3:28:22 AM	36300	11.07
1/27/2018	3:33:22 AM	36600	11.07
1/27/2018	3:38:22 AM	36900	11.07
1/27/2018	3:43:22 AM	37200	11.06
1/27/2018	3:48:22 AM	37500	11.06
1/27/2018	3:53:22 AM	37800	11.06
1/27/2018	3:58:22 AM	38100	11.06
1/27/2018	4:03:22 AM	38400	11.07
1/27/2018	4:08:22 AM	38700	11.06
1/27/2018	4:13:22 AM	39000	11.06
1/27/2018	4:18:22 AM	39300	11.06
1/27/2018	4:23:22 AM	39600	11.06
1/27/2018	4:28:22 AM	39900	11.06
1/27/2018	4:33:22 AM	40200	11.05

17WW01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/27/2018	4:38:22 AM	40500	11.05
1/27/2018	4:43:22 AM	40800	11.05
1/27/2018	4:48:22 AM	41100	11.05
1/27/2018	4:53:22 AM	41400	11.05
1/27/2018	4:58:22 AM	41700	11.05
1/27/2018	5:03:22 AM	42000	11.05
1/27/2018	5:08:22 AM	42300	11.05
1/27/2018	5:13:22 AM	42600	11.05
1/27/2018	5:18:22 AM	42900	11.05
1/27/2018	5:23:22 AM	43200	11.06
1/27/2018	5:28:22 AM	43500	11.05
1/27/2018	5:33:22 AM	43800	11.05
1/27/2018	5:38:22 AM	44100	11.05
1/27/2018	5:43:22 AM	44400	11.05
1/27/2018	5:48:22 AM	44700	11.05
1/27/2018	5:53:22 AM	45000	11.05
1/27/2018	5:58:22 AM	45300	11.05
1/27/2018	6:03:22 AM	45600	11.05
1/27/2018	6:08:22 AM	45900	11.04
1/27/2018	6:13:22 AM	46200	11.05
1/27/2018	6:18:22 AM	46500	11.05
1/27/2018	6:23:22 AM	46800	11.05
1/27/2018	6:28:22 AM	47100	11.05
1/27/2018	6:33:22 AM	47400	11.04
1/27/2018	6:38:22 AM	47700	11.05
1/27/2018	6:43:22 AM	48000	11.05
1/27/2018	6:48:22 AM	48300	11.05
1/27/2018	6:53:22 AM	48600	11.05
1/27/2018	6:58:22 AM	48900	11.05
1/27/2018	7:03:22 AM	49200	11.04
1/27/2018	7:08:22 AM	49500	11.04
1/27/2018	7:13:22 AM	49800	11.05
1/27/2018	7:18:22 AM	50100	11.04
1/27/2018	7:23:22 AM	50400	11.05
1/27/2018	7:28:22 AM	50700	11.05
1/27/2018	7:33:22 AM	51000	11.05
1/27/2018	7:38:22 AM	51300	11.04
1/27/2018	7:43:22 AM	51600	11.05
1/27/2018	7:48:22 AM	51900	11.04
1/27/2018	7:53:22 AM	52200	11.04
1/27/2018	7:58:22 AM	52500	11.05
1/27/2018	8:03:22 AM	52800	11.04
1/27/2018	8:08:22 AM	53100	11.04
1/27/2018	8:13:22 AM	53400	11.04
1/27/2018	8:18:22 AM	53700	11.04

17WW01 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW01
1/27/2018	8:23:22 AM	54000	11.05
1/27/2018	8:28:22 AM	54300	11.05
1/27/2018	8:33:22 AM	54600	11.04
1/27/2018	8:38:22 AM	54900	11.05
1/27/2018	8:43:22 AM	55200	11.05
1/27/2018	8:48:22 AM	55500	11.07
1/27/2018	8:53:22 AM	55800	11.04
1/27/2018	8:58:22 AM	56100	11.04
1/27/2018	9:03:22 AM	56400	11.04
1/27/2018	9:08:22 AM	56700	11.03
1/27/2018	9:13:22 AM	57000	11.04
1/27/2018	9:18:22 AM	57300	11.04
1/27/2018	9:19:55 AM	57393	11.04

17WW02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	5:23:22 PM	0	19.28
1/26/2018	5:28:22 PM	300	18.36
1/26/2018	5:33:22 PM	600	17.67
1/26/2018	5:38:22 PM	900	17.05
1/26/2018	5:43:22 PM	1200	16.5
1/26/2018	5:48:22 PM	1500	16.01
1/26/2018	5:53:22 PM	1800	15.51
1/26/2018	5:58:22 PM	2100	14.96
1/26/2018	6:03:22 PM	2400	14.24
1/26/2018	6:08:22 PM	2700	13.64
1/26/2018	6:13:22 PM	3000	13.12
1/26/2018	6:18:22 PM	3300	12.67
1/26/2018	6:23:22 PM	3600	12.29
1/26/2018	6:28:22 PM	3900	11.95
1/26/2018	6:33:22 PM	4200	11.66
1/26/2018	6:38:22 PM	4500	11.4
1/26/2018	6:43:22 PM	4800	11.18
1/26/2018	6:48:22 PM	5100	10.99
1/26/2018	6:53:22 PM	5400	10.83
1/26/2018	6:58:22 PM	5700	10.7
1/26/2018	7:03:22 PM	6000	10.59
1/26/2018	7:08:22 PM	6300	10.48
1/26/2018	7:13:22 PM	6600	10.41
1/26/2018	7:18:22 PM	6900	10.33
1/26/2018	7:23:22 PM	7200	10.28
1/26/2018	7:28:22 PM	7500	10.23
1/26/2018	7:33:22 PM	7800	10.19
1/26/2018	7:38:22 PM	8100	10.16
1/26/2018	7:43:22 PM	8400	10.13
1/26/2018	7:48:22 PM	8700	10.1
1/26/2018	7:53:22 PM	9000	10.09
1/26/2018	7:58:22 PM	9300	10.07
1/26/2018	8:03:22 PM	9600	10.06
1/26/2018	8:08:22 PM	9900	10.05
1/26/2018	8:13:22 PM	10200	10.04
1/26/2018	8:18:22 PM	10500	10.03
1/26/2018	8:23:22 PM	10800	10.02
1/26/2018	8:28:22 PM	11100	10.02
1/26/2018	8:33:22 PM	11400	10.01
1/26/2018	8:38:22 PM	11700	10
1/26/2018	8:43:22 PM	12000	9.99
1/26/2018	8:48:22 PM	12300	9.98
1/26/2018	8:53:22 PM	12600	9.98
1/26/2018	8:58:22 PM	12900	9.97
1/26/2018	9:03:22 PM	13200	9.97

17WW02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/26/2018	9:08:22 PM	13500	9.95
1/26/2018	9:13:22 PM	13800	9.95
1/26/2018	9:18:22 PM	14100	9.94
1/26/2018	9:23:22 PM	14400	9.93
1/26/2018	9:28:22 PM	14700	9.92
1/26/2018	9:33:22 PM	15000	9.92
1/26/2018	9:38:22 PM	15300	9.9
1/26/2018	9:43:22 PM	15600	9.89
1/26/2018	9:48:22 PM	15900	9.88
1/26/2018	9:53:22 PM	16200	9.87
1/26/2018	9:58:22 PM	16500	9.86
1/26/2018	10:03:22 PM	16800	9.86
1/26/2018	10:08:22 PM	17100	9.84
1/26/2018	10:13:22 PM	17400	9.83
1/26/2018	10:18:22 PM	17700	9.82
1/26/2018	10:23:22 PM	18000	9.81
1/26/2018	10:28:22 PM	18300	9.81
1/26/2018	10:33:22 PM	18600	9.8
1/26/2018	10:38:22 PM	18900	9.79
1/26/2018	10:43:22 PM	19200	9.78
1/26/2018	10:48:22 PM	19500	9.77
1/26/2018	10:53:22 PM	19800	9.75
1/26/2018	10:58:22 PM	20100	9.75
1/26/2018	11:03:22 PM	20400	9.74
1/26/2018	11:08:22 PM	20700	9.73
1/26/2018	11:13:22 PM	21000	9.71
1/26/2018	11:18:22 PM	21300	9.7
1/26/2018	11:23:22 PM	21600	9.68
1/26/2018	11:28:22 PM	21900	9.66
1/26/2018	11:33:22 PM	22200	9.65
1/26/2018	11:38:22 PM	22500	9.64
1/26/2018	11:43:22 PM	22800	9.62
1/26/2018	11:48:22 PM	23100	9.61
1/26/2018	11:53:22 PM	23400	9.6
1/26/2018	11:58:22 PM	23700	9.59
1/27/2018	12:03:22 AM	24000	9.58
1/27/2018	12:08:22 AM	24300	9.57
1/27/2018	12:13:22 AM	24600	9.56
1/27/2018	12:18:22 AM	24900	9.55
1/27/2018	12:23:22 AM	25200	9.55
1/27/2018	12:28:22 AM	25500	9.54
1/27/2018	12:33:22 AM	25800	9.53
1/27/2018	12:38:22 AM	26100	9.53
1/27/2018	12:43:22 AM	26400	9.52
1/27/2018	12:48:22 AM	26700	9.52

17WW02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/27/2018	12:53:22 AM	27000	9.51
1/27/2018	12:58:22 AM	27300	9.51
1/27/2018	1:03:22 AM	27600	9.5
1/27/2018	1:08:22 AM	27900	9.49
1/27/2018	1:13:22 AM	28200	9.49
1/27/2018	1:18:22 AM	28500	9.49
1/27/2018	1:23:22 AM	28800	9.48
1/27/2018	1:28:22 AM	29100	9.48
1/27/2018	1:33:22 AM	29400	9.47
1/27/2018	1:38:22 AM	29700	9.47
1/27/2018	1:43:22 AM	30000	9.46
1/27/2018	1:48:22 AM	30300	9.46
1/27/2018	1:53:22 AM	30600	9.46
1/27/2018	1:58:22 AM	30900	9.46
1/27/2018	2:03:22 AM	31200	9.45
1/27/2018	2:08:22 AM	31500	9.45
1/27/2018	2:13:22 AM	31800	9.44
1/27/2018	2:18:22 AM	32100	9.44
1/27/2018	2:23:22 AM	32400	9.43
1/27/2018	2:28:22 AM	32700	9.43
1/27/2018	2:33:22 AM	33000	9.43
1/27/2018	2:38:22 AM	33300	9.42
1/27/2018	2:43:22 AM	33600	9.42
1/27/2018	2:48:22 AM	33900	9.42
1/27/2018	2:53:22 AM	34200	9.42
1/27/2018	2:58:22 AM	34500	9.41
1/27/2018	3:03:22 AM	34800	9.42
1/27/2018	3:08:22 AM	35100	9.41
1/27/2018	3:13:22 AM	35400	9.41
1/27/2018	3:18:22 AM	35700	9.41
1/27/2018	3:23:22 AM	36000	9.41
1/27/2018	3:28:22 AM	36300	9.4
1/27/2018	3:33:22 AM	36600	9.4
1/27/2018	3:38:22 AM	36900	9.4
1/27/2018	3:43:22 AM	37200	9.4
1/27/2018	3:48:22 AM	37500	9.4
1/27/2018	3:53:22 AM	37800	9.4
1/27/2018	3:58:22 AM	38100	9.39
1/27/2018	4:03:22 AM	38400	9.39
1/27/2018	4:08:22 AM	38700	9.39
1/27/2018	4:13:22 AM	39000	9.38
1/27/2018	4:18:22 AM	39300	9.38
1/27/2018	4:23:22 AM	39600	9.37
1/27/2018	4:28:22 AM	39900	9.37
1/27/2018	4:33:22 AM	40200	9.37

17WW02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/27/2018	4:38:22 AM	40500	9.37
1/27/2018	4:43:22 AM	40800	9.36
1/27/2018	4:48:22 AM	41100	9.36
1/27/2018	4:53:22 AM	41400	9.36
1/27/2018	4:58:22 AM	41700	9.35
1/27/2018	5:03:22 AM	42000	9.35
1/27/2018	5:08:22 AM	42300	9.35
1/27/2018	5:13:22 AM	42600	9.35
1/27/2018	5:18:22 AM	42900	9.35
1/27/2018	5:23:22 AM	43200	9.35
1/27/2018	5:28:22 AM	43500	9.35
1/27/2018	5:33:22 AM	43800	9.35
1/27/2018	5:38:22 AM	44100	9.35
1/27/2018	5:43:22 AM	44400	9.35
1/27/2018	5:48:22 AM	44700	9.35
1/27/2018	5:53:22 AM	45000	9.35
1/27/2018	5:58:22 AM	45300	9.35
1/27/2018	6:03:22 AM	45600	9.34
1/27/2018	6:08:22 AM	45900	9.35
1/27/2018	6:13:22 AM	46200	9.34
1/27/2018	6:18:22 AM	46500	9.34
1/27/2018	6:23:22 AM	46800	9.34
1/27/2018	6:28:22 AM	47100	9.34
1/27/2018	6:33:22 AM	47400	9.34
1/27/2018	6:38:22 AM	47700	9.34
1/27/2018	6:43:22 AM	48000	9.34
1/27/2018	6:48:22 AM	48300	9.34
1/27/2018	6:53:22 AM	48600	9.33
1/27/2018	6:58:22 AM	48900	9.34
1/27/2018	7:03:22 AM	49200	9.33
1/27/2018	7:08:22 AM	49500	9.34
1/27/2018	7:13:22 AM	49800	9.34
1/27/2018	7:18:22 AM	50100	9.34
1/27/2018	7:23:22 AM	50400	9.34
1/27/2018	7:28:22 AM	50700	9.33
1/27/2018	7:33:22 AM	51000	9.34
1/27/2018	7:38:22 AM	51300	9.33
1/27/2018	7:43:22 AM	51600	9.33
1/27/2018	7:48:22 AM	51900	9.33
1/27/2018	7:53:22 AM	52200	9.33
1/27/2018	7:58:22 AM	52500	9.33
1/27/2018	8:03:22 AM	52800	9.33
1/27/2018	8:08:22 AM	53100	9.33
1/27/2018	8:13:22 AM	53400	9.33
1/27/2018	8:18:22 AM	53700	9.33

17WW02 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW02
1/27/2018	8:23:22 AM	54000	9.33
1/27/2018	8:28:22 AM	54300	9.33
1/27/2018	8:33:22 AM	54600	9.33
1/27/2018	8:38:22 AM	54900	9.33
1/27/2018	8:43:22 AM	55200	9.33
1/27/2018	8:48:22 AM	55500	9.35
1/27/2018	8:53:22 AM	55800	9.33
1/27/2018	8:58:22 AM	56100	9.32
1/27/2018	9:03:22 AM	56400	9.32
1/27/2018	9:08:22 AM	56700	9.32
1/27/2018	9:13:22 AM	57000	9.33
1/27/2018	9:18:22 AM	57300	9.33
1/27/2018	9:19:55 AM	57393	9.32

17WW06 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/26/2018	5:23:22 PM	0	15.81
1/26/2018	5:28:22 PM	300	13.74
1/26/2018	5:33:22 PM	600	13.09
1/26/2018	5:38:22 PM	900	12.85
1/26/2018	5:43:22 PM	1200	12.73
1/26/2018	5:48:22 PM	1500	12.63
1/26/2018	5:53:22 PM	1800	12.55
1/26/2018	5:58:22 PM	2100	12.49
1/26/2018	6:03:22 PM	2400	12.45
1/26/2018	6:08:22 PM	2700	12.41
1/26/2018	6:13:22 PM	3000	12.38
1/26/2018	6:18:22 PM	3300	12.36
1/26/2018	6:23:22 PM	3600	12.33
1/26/2018	6:28:22 PM	3900	12.31
1/26/2018	6:33:22 PM	4200	12.29
1/26/2018	6:38:22 PM	4500	12.28
1/26/2018	6:43:22 PM	4800	12.26
1/26/2018	6:48:22 PM	5100	12.25
1/26/2018	6:53:22 PM	5400	12.23
1/26/2018	6:58:22 PM	5700	12.22
1/26/2018	7:03:22 PM	6000	12.21
1/26/2018	7:08:22 PM	6300	12.19
1/26/2018	7:13:22 PM	6600	12.18
1/26/2018	7:18:22 PM	6900	12.17
1/26/2018	7:23:22 PM	7200	12.16
1/26/2018	7:28:22 PM	7500	12.15
1/26/2018	7:33:22 PM	7800	12.15
1/26/2018	7:38:22 PM	8100	12.14
1/26/2018	7:43:22 PM	8400	12.13
1/26/2018	7:48:22 PM	8700	12.12
1/26/2018	7:53:22 PM	9000	12.11
1/26/2018	7:58:22 PM	9300	12.12
1/26/2018	8:03:22 PM	9600	12.1
1/26/2018	8:08:22 PM	9900	12.09
1/26/2018	8:13:22 PM	10200	12.08
1/26/2018	8:18:22 PM	10500	12.08
1/26/2018	8:23:22 PM	10800	12.08
1/26/2018	8:28:22 PM	11100	12.07
1/26/2018	8:33:22 PM	11400	12.06
1/26/2018	8:38:22 PM	11700	12.06
1/26/2018	8:43:22 PM	12000	12.05
1/26/2018	8:48:22 PM	12300	12.05
1/26/2018	8:53:22 PM	12600	12.04
1/26/2018	8:58:22 PM	12900	12.04
1/26/2018	9:03:22 PM	13200	12.03

17WW06 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/26/2018	9:08:22 PM	13500	12.03
1/26/2018	9:13:22 PM	13800	12.03
1/26/2018	9:18:22 PM	14100	12.02
1/26/2018	9:23:22 PM	14400	12.02
1/26/2018	9:28:22 PM	14700	12.01
1/26/2018	9:33:22 PM	15000	12.01
1/26/2018	9:38:22 PM	15300	12.01
1/26/2018	9:43:22 PM	15600	12.01
1/26/2018	9:48:22 PM	15900	12
1/26/2018	9:53:22 PM	16200	12
1/26/2018	9:58:22 PM	16500	12
1/26/2018	10:03:22 PM	16800	11.99
1/26/2018	10:08:22 PM	17100	11.99
1/26/2018	10:13:22 PM	17400	11.99
1/26/2018	10:18:22 PM	17700	11.99
1/26/2018	10:23:22 PM	18000	11.98
1/26/2018	10:28:22 PM	18300	11.98
1/26/2018	10:33:22 PM	18600	11.98
1/26/2018	10:38:22 PM	18900	11.98
1/26/2018	10:43:22 PM	19200	11.97
1/26/2018	10:48:22 PM	19500	11.97
1/26/2018	10:53:22 PM	19800	11.96
1/26/2018	10:58:22 PM	20100	11.96
1/26/2018	11:03:22 PM	20400	11.96
1/26/2018	11:08:22 PM	20700	11.96
1/26/2018	11:13:22 PM	21000	11.95
1/26/2018	11:18:22 PM	21300	11.96
1/26/2018	11:23:22 PM	21600	11.95
1/26/2018	11:28:22 PM	21900	11.95
1/26/2018	11:33:22 PM	22200	11.95
1/26/2018	11:38:22 PM	22500	11.94
1/26/2018	11:43:22 PM	22800	11.94
1/26/2018	11:48:22 PM	23100	11.94
1/26/2018	11:53:22 PM	23400	11.94
1/26/2018	11:58:22 PM	23700	11.94
1/27/2018	12:03:22 AM	24000	11.94
1/27/2018	12:08:22 AM	24300	11.93
1/27/2018	12:13:22 AM	24600	11.93
1/27/2018	12:18:22 AM	24900	11.93
1/27/2018	12:23:22 AM	25200	11.93
1/27/2018	12:28:22 AM	25500	11.92
1/27/2018	12:33:22 AM	25800	11.92
1/27/2018	12:38:22 AM	26100	11.93
1/27/2018	12:43:22 AM	26400	11.92
1/27/2018	12:48:22 AM	26700	11.91

17WW06 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/27/2018	12:53:22 AM	27000	11.92
1/27/2018	12:58:22 AM	27300	11.91
1/27/2018	1:03:22 AM	27600	11.91
1/27/2018	1:08:22 AM	27900	11.91
1/27/2018	1:13:22 AM	28200	11.91
1/27/2018	1:18:22 AM	28500	11.91
1/27/2018	1:23:22 AM	28800	11.9
1/27/2018	1:28:22 AM	29100	11.9
1/27/2018	1:33:22 AM	29400	11.9
1/27/2018	1:38:22 AM	29700	11.9
1/27/2018	1:43:22 AM	30000	11.9
1/27/2018	1:48:22 AM	30300	11.9
1/27/2018	1:53:22 AM	30600	11.9
1/27/2018	1:58:22 AM	30900	11.89
1/27/2018	2:03:22 AM	31200	11.89
1/27/2018	2:08:22 AM	31500	11.89
1/27/2018	2:13:22 AM	31800	11.89
1/27/2018	2:18:22 AM	32100	11.89
1/27/2018	2:23:22 AM	32400	11.89
1/27/2018	2:28:22 AM	32700	11.88
1/27/2018	2:33:22 AM	33000	11.89
1/27/2018	2:38:22 AM	33300	11.88
1/27/2018	2:43:22 AM	33600	11.88
1/27/2018	2:48:22 AM	33900	11.88
1/27/2018	2:53:22 AM	34200	11.88
1/27/2018	2:58:22 AM	34500	11.88
1/27/2018	3:03:22 AM	34800	11.87
1/27/2018	3:08:22 AM	35100	11.87
1/27/2018	3:13:22 AM	35400	11.87
1/27/2018	3:18:22 AM	35700	11.88
1/27/2018	3:23:22 AM	36000	11.87
1/27/2018	3:28:22 AM	36300	11.87
1/27/2018	3:33:22 AM	36600	11.87
1/27/2018	3:38:22 AM	36900	11.87
1/27/2018	3:43:22 AM	37200	11.87
1/27/2018	3:48:22 AM	37500	11.87
1/27/2018	3:53:22 AM	37800	11.86
1/27/2018	3:58:22 AM	38100	11.86
1/27/2018	4:03:22 AM	38400	11.86
1/27/2018	4:08:22 AM	38700	11.86
1/27/2018	4:13:22 AM	39000	11.85
1/27/2018	4:18:22 AM	39300	11.86
1/27/2018	4:23:22 AM	39600	11.86
1/27/2018	4:28:22 AM	39900	11.86
1/27/2018	4:33:22 AM	40200	11.85

17WW06 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/27/2018	4:38:22 AM	40500	11.85
1/27/2018	4:43:22 AM	40800	11.85
1/27/2018	4:48:22 AM	41100	11.85
1/27/2018	4:53:22 AM	41400	11.85
1/27/2018	4:58:22 AM	41700	11.85
1/27/2018	5:03:22 AM	42000	11.85
1/27/2018	5:08:22 AM	42300	11.85
1/27/2018	5:13:22 AM	42600	11.86
1/27/2018	5:18:22 AM	42900	11.85
1/27/2018	5:23:22 AM	43200	11.85
1/27/2018	5:28:22 AM	43500	11.86
1/27/2018	5:33:22 AM	43800	11.85
1/27/2018	5:38:22 AM	44100	11.85
1/27/2018	5:43:22 AM	44400	11.84
1/27/2018	5:48:22 AM	44700	11.84
1/27/2018	5:53:22 AM	45000	11.85
1/27/2018	5:58:22 AM	45300	11.84
1/27/2018	6:03:22 AM	45600	11.85
1/27/2018	6:08:22 AM	45900	11.85
1/27/2018	6:13:22 AM	46200	11.84
1/27/2018	6:18:22 AM	46500	11.84
1/27/2018	6:23:22 AM	46800	11.84
1/27/2018	6:28:22 AM	47100	11.84
1/27/2018	6:33:22 AM	47400	11.84
1/27/2018	6:38:22 AM	47700	11.85
1/27/2018	6:43:22 AM	48000	11.84
1/27/2018	6:48:22 AM	48300	11.84
1/27/2018	6:53:22 AM	48600	11.84
1/27/2018	6:58:22 AM	48900	11.84
1/27/2018	7:03:22 AM	49200	11.84
1/27/2018	7:08:22 AM	49500	11.84
1/27/2018	7:13:22 AM	49800	11.84
1/27/2018	7:18:22 AM	50100	11.84
1/27/2018	7:23:22 AM	50400	11.84
1/27/2018	7:28:22 AM	50700	11.84
1/27/2018	7:33:22 AM	51000	11.84
1/27/2018	7:38:22 AM	51300	11.84
1/27/2018	7:43:22 AM	51600	11.84
1/27/2018	7:48:22 AM	51900	11.84
1/27/2018	7:53:22 AM	52200	11.84
1/27/2018	7:58:22 AM	52500	11.83
1/27/2018	8:03:22 AM	52800	11.83
1/27/2018	8:08:22 AM	53100	11.84
1/27/2018	8:13:22 AM	53400	11.84
1/27/2018	8:18:22 AM	53700	11.84

17WW06 Recovery.xlsm

Date	Time	Elapsed Time	
		(seconds)	17WW06
1/27/2018	8:23:22 AM	54000	11.84
1/27/2018	8:28:22 AM	54300	11.84
1/27/2018	8:33:22 AM	54600	11.84
1/27/2018	8:38:22 AM	54900	11.84
1/27/2018	8:43:22 AM	55200	11.84
1/27/2018	8:48:22 AM	55500	11.85
1/27/2018	8:53:22 AM	55800	11.83
1/27/2018	8:58:22 AM	56100	11.84
1/27/2018	9:03:22 AM	56400	11.83
1/27/2018	9:08:22 AM	56700	11.83
1/27/2018	9:13:22 AM	57000	11.83
1/27/2018	9:18:22 AM	57300	11.84
1/27/2018	9:19:55 AM	57393	11.83

130 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	130
1/26/2018	5:23:22 PM	0	8.88
1/26/2018	5:28:22 PM	300	8.88
1/26/2018	5:33:22 PM	600	8.89
1/26/2018	5:38:22 PM	900	8.89
1/26/2018	5:43:22 PM	1200	8.88
1/26/2018	5:48:22 PM	1500	8.88
1/26/2018	5:53:22 PM	1800	8.88
1/26/2018	5:58:22 PM	2100	8.89
1/26/2018	6:03:22 PM	2400	8.88
1/26/2018	6:08:22 PM	2700	8.89
1/26/2018	6:13:22 PM	3000	8.89
1/26/2018	6:18:22 PM	3300	8.89
1/26/2018	6:23:22 PM	3600	8.89
1/26/2018	6:28:22 PM	3900	8.89
1/26/2018	6:33:22 PM	4200	8.9
1/26/2018	6:38:22 PM	4500	8.89
1/26/2018	6:43:22 PM	4800	8.89
1/26/2018	6:48:22 PM	5100	8.9
1/26/2018	6:53:22 PM	5400	8.91
1/26/2018	6:58:22 PM	5700	8.9
1/26/2018	7:03:22 PM	6000	8.9
1/26/2018	7:08:22 PM	6300	8.91
1/26/2018	7:13:22 PM	6600	8.9
1/26/2018	7:18:22 PM	6900	8.9
1/26/2018	7:23:22 PM	7200	8.9
1/26/2018	7:28:22 PM	7500	8.9
1/26/2018	7:33:22 PM	7800	8.9
1/26/2018	7:38:22 PM	8100	8.9
1/26/2018	7:43:22 PM	8400	8.91
1/26/2018	7:48:22 PM	8700	8.9
1/26/2018	7:53:22 PM	9000	8.91
1/26/2018	7:58:22 PM	9300	8.91
1/26/2018	8:03:22 PM	9600	8.91
1/26/2018	8:08:22 PM	9900	8.9
1/26/2018	8:13:22 PM	10200	8.9
1/26/2018	8:18:22 PM	10500	8.91
1/26/2018	8:23:22 PM	10800	8.91
1/26/2018	8:28:22 PM	11100	8.91
1/26/2018	8:33:22 PM	11400	8.9
1/26/2018	8:38:22 PM	11700	8.9
1/26/2018	8:43:22 PM	12000	8.91
1/26/2018	8:48:22 PM	12300	8.9
1/26/2018	8:53:22 PM	12600	8.9
1/26/2018	8:58:22 PM	12900	8.91
1/26/2018	9:03:22 PM	13200	8.9

130 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	130
1/26/2018	9:08:22 PM	13500	8.9
1/26/2018	9:13:22 PM	13800	8.9
1/26/2018	9:18:22 PM	14100	8.9
1/26/2018	9:23:22 PM	14400	8.9
1/26/2018	9:28:22 PM	14700	8.9
1/26/2018	9:33:22 PM	15000	8.9
1/26/2018	9:38:22 PM	15300	8.9
1/26/2018	9:43:22 PM	15600	8.9
1/26/2018	9:48:22 PM	15900	8.9
1/26/2018	9:53:22 PM	16200	8.9
1/26/2018	9:58:22 PM	16500	8.9
1/26/2018	10:03:22 PM	16800	8.91
1/26/2018	10:08:22 PM	17100	8.89
1/26/2018	10:13:22 PM	17400	8.9
1/26/2018	10:18:22 PM	17700	8.9
1/26/2018	10:23:22 PM	18000	8.9
1/26/2018	10:28:22 PM	18300	8.9
1/26/2018	10:33:22 PM	18600	8.9
1/26/2018	10:38:22 PM	18900	8.9
1/26/2018	10:43:22 PM	19200	8.89
1/26/2018	10:48:22 PM	19500	8.9
1/26/2018	10:53:22 PM	19800	8.9
1/26/2018	10:58:22 PM	20100	8.89
1/26/2018	11:03:22 PM	20400	8.89
1/26/2018	11:08:22 PM	20700	8.89
1/26/2018	11:13:22 PM	21000	8.89
1/26/2018	11:18:22 PM	21300	8.89
1/26/2018	11:23:22 PM	21600	8.89
1/26/2018	11:28:22 PM	21900	8.89
1/26/2018	11:33:22 PM	22200	8.89
1/26/2018	11:38:22 PM	22500	8.89
1/26/2018	11:43:22 PM	22800	8.89
1/26/2018	11:48:22 PM	23100	8.89
1/26/2018	11:53:22 PM	23400	8.89
1/26/2018	11:58:22 PM	23700	8.89
1/27/2018	12:03:22 AM	24000	8.89
1/27/2018	12:08:22 AM	24300	8.89
1/27/2018	12:13:22 AM	24600	8.89
1/27/2018	12:18:22 AM	24900	8.89
1/27/2018	12:23:22 AM	25200	8.89
1/27/2018	12:28:22 AM	25500	8.89
1/27/2018	12:33:22 AM	25800	8.88
1/27/2018	12:38:22 AM	26100	8.88
1/27/2018	12:43:22 AM	26400	8.88
1/27/2018	12:48:22 AM	26700	8.88

130 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	130
1/27/2018	12:53:22 AM	27000	8.88
1/27/2018	12:58:22 AM	27300	8.88
1/27/2018	1:03:22 AM	27600	8.88
1/27/2018	1:08:22 AM	27900	8.88
1/27/2018	1:13:22 AM	28200	8.88
1/27/2018	1:18:22 AM	28500	8.88
1/27/2018	1:23:22 AM	28800	8.88
1/27/2018	1:28:22 AM	29100	8.87
1/27/2018	1:33:22 AM	29400	8.87
1/27/2018	1:38:22 AM	29700	8.87
1/27/2018	1:43:22 AM	30000	8.87
1/27/2018	1:48:22 AM	30300	8.88
1/27/2018	1:53:22 AM	30600	8.87
1/27/2018	1:58:22 AM	30900	8.87
1/27/2018	2:03:22 AM	31200	8.87
1/27/2018	2:08:22 AM	31500	8.87
1/27/2018	2:13:22 AM	31800	8.86
1/27/2018	2:18:22 AM	32100	8.87
1/27/2018	2:23:22 AM	32400	8.87
1/27/2018	2:28:22 AM	32700	8.86
1/27/2018	2:33:22 AM	33000	8.86
1/27/2018	2:38:22 AM	33300	8.87
1/27/2018	2:43:22 AM	33600	8.87
1/27/2018	2:48:22 AM	33900	8.86
1/27/2018	2:53:22 AM	34200	8.86
1/27/2018	2:58:22 AM	34500	8.87
1/27/2018	3:03:22 AM	34800	8.86
1/27/2018	3:08:22 AM	35100	8.86
1/27/2018	3:13:22 AM	35400	8.86
1/27/2018	3:18:22 AM	35700	8.86
1/27/2018	3:23:22 AM	36000	8.86
1/27/2018	3:28:22 AM	36300	8.86
1/27/2018	3:33:22 AM	36600	8.86
1/27/2018	3:38:22 AM	36900	8.86
1/27/2018	3:43:22 AM	37200	8.86
1/27/2018	3:48:22 AM	37500	8.86
1/27/2018	3:53:22 AM	37800	8.86
1/27/2018	3:58:22 AM	38100	8.86
1/27/2018	4:03:22 AM	38400	8.85
1/27/2018	4:08:22 AM	38700	8.85
1/27/2018	4:13:22 AM	39000	8.85
1/27/2018	4:18:22 AM	39300	8.85
1/27/2018	4:23:22 AM	39600	8.85
1/27/2018	4:28:22 AM	39900	8.85
1/27/2018	4:33:22 AM	40200	8.85

130 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	130
1/27/2018	4:38:22 AM	40500	8.85
1/27/2018	4:43:22 AM	40800	8.85
1/27/2018	4:48:22 AM	41100	8.85
1/27/2018	4:53:22 AM	41400	8.85
1/27/2018	4:58:22 AM	41700	8.84
1/27/2018	5:03:22 AM	42000	8.85
1/27/2018	5:08:22 AM	42300	8.85
1/27/2018	5:13:22 AM	42600	8.85
1/27/2018	5:18:22 AM	42900	8.85
1/27/2018	5:23:22 AM	43200	8.85
1/27/2018	5:28:22 AM	43500	8.85
1/27/2018	5:33:22 AM	43800	8.85
1/27/2018	5:38:22 AM	44100	8.85
1/27/2018	5:43:22 AM	44400	8.85
1/27/2018	5:48:22 AM	44700	8.84
1/27/2018	5:53:22 AM	45000	8.85
1/27/2018	5:58:22 AM	45300	8.85
1/27/2018	6:03:22 AM	45600	8.85
1/27/2018	6:08:22 AM	45900	8.85
1/27/2018	6:13:22 AM	46200	8.85
1/27/2018	6:18:22 AM	46500	8.84
1/27/2018	6:23:22 AM	46800	8.85
1/27/2018	6:28:22 AM	47100	8.85
1/27/2018	6:33:22 AM	47400	8.85
1/27/2018	6:38:22 AM	47700	8.85
1/27/2018	6:43:22 AM	48000	8.85
1/27/2018	6:48:22 AM	48300	8.85
1/27/2018	6:53:22 AM	48600	8.85
1/27/2018	6:58:22 AM	48900	8.85
1/27/2018	7:03:22 AM	49200	8.85
1/27/2018	7:08:22 AM	49500	8.85
1/27/2018	7:13:22 AM	49800	8.85
1/27/2018	7:18:22 AM	50100	8.85
1/27/2018	7:23:22 AM	50400	8.85
1/27/2018	7:28:22 AM	50700	8.86
1/27/2018	7:33:22 AM	51000	8.85
1/27/2018	7:38:22 AM	51300	8.85
1/27/2018	7:43:22 AM	51600	8.85
1/27/2018	7:48:22 AM	51900	8.85
1/27/2018	7:53:22 AM	52200	8.85
1/27/2018	7:58:22 AM	52500	8.85
1/27/2018	8:03:22 AM	52800	8.85
1/27/2018	8:08:22 AM	53100	8.85
1/27/2018	8:13:22 AM	53400	8.85
1/27/2018	8:18:22 AM	53700	8.85

130 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	130
1/27/2018	8:23:22 AM	54000	8.85
1/27/2018	8:28:22 AM	54300	8.86
1/27/2018	8:33:22 AM	54600	8.85
1/27/2018	8:38:22 AM	54900	8.85
1/27/2018	8:43:22 AM	55200	8.85
1/27/2018	8:48:22 AM	55500	8.86
1/27/2018	8:53:22 AM	55800	8.86
1/27/2018	8:58:22 AM	56100	8.85
1/27/2018	9:03:22 AM	56400	8.86
1/27/2018	9:08:22 AM	56700	8.85
1/27/2018	9:13:22 AM	57000	8.85
1/27/2018	9:18:22 AM	57300	8.85
1/27/2018	9:19:55 AM	57393	8.85

MW-8 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	MW08
1/26/2018	5:23:22 PM	0	18.94
1/26/2018	5:28:22 PM	300	18.93
1/26/2018	5:33:22 PM	600	18.95
1/26/2018	5:38:22 PM	900	18.94
1/26/2018	5:43:22 PM	1200	18.93
1/26/2018	5:48:22 PM	1500	18.93
1/26/2018	5:53:22 PM	1800	18.91
1/26/2018	5:58:22 PM	2100	18.92
1/26/2018	6:03:22 PM	2400	18.9
1/26/2018	6:08:22 PM	2700	18.9
1/26/2018	6:13:22 PM	3000	18.92
1/26/2018	6:18:22 PM	3300	18.9
1/26/2018	6:23:22 PM	3600	18.91
1/26/2018	6:28:22 PM	3900	18.91
1/26/2018	6:33:22 PM	4200	18.93
1/26/2018	6:38:22 PM	4500	18.93
1/26/2018	6:43:22 PM	4800	18.92
1/26/2018	6:48:22 PM	5100	18.94
1/26/2018	6:53:22 PM	5400	18.91
1/26/2018	6:58:22 PM	5700	18.93
1/26/2018	7:03:22 PM	6000	18.92
1/26/2018	7:08:22 PM	6300	18.94
1/26/2018	7:13:22 PM	6600	18.92
1/26/2018	7:18:22 PM	6900	18.92
1/26/2018	7:23:22 PM	7200	18.93
1/26/2018	7:28:22 PM	7500	18.92
1/26/2018	7:33:22 PM	7800	18.92
1/26/2018	7:38:22 PM	8100	18.93
1/26/2018	7:43:22 PM	8400	18.94
1/26/2018	7:48:22 PM	8700	18.9
1/26/2018	7:53:22 PM	9000	18.9
1/26/2018	7:58:22 PM	9300	18.9
1/26/2018	8:03:22 PM	9600	18.91
1/26/2018	8:08:22 PM	9900	18.92
1/26/2018	8:13:22 PM	10200	18.92
1/26/2018	8:18:22 PM	10500	18.93
1/26/2018	8:23:22 PM	10800	18.96
1/26/2018	8:28:22 PM	11100	18.97
1/26/2018	8:33:22 PM	11400	18.95
1/26/2018	8:38:22 PM	11700	18.93
1/26/2018	8:43:22 PM	12000	18.93
1/26/2018	8:48:22 PM	12300	18.94
1/26/2018	8:53:22 PM	12600	18.93
1/26/2018	8:58:22 PM	12900	18.92
1/26/2018	9:03:22 PM	13200	18.92

MW-8 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	MW08
1/26/2018	9:08:22 PM	13500	18.94
1/26/2018	9:13:22 PM	13800	18.93
1/26/2018	9:18:22 PM	14100	18.92
1/26/2018	9:23:22 PM	14400	18.93
1/26/2018	9:28:22 PM	14700	18.92
1/26/2018	9:33:22 PM	15000	18.92
1/26/2018	9:38:22 PM	15300	18.92
1/26/2018	9:43:22 PM	15600	18.94
1/26/2018	9:48:22 PM	15900	18.93
1/26/2018	9:53:22 PM	16200	18.93
1/26/2018	9:58:22 PM	16500	18.92
1/26/2018	10:03:22 PM	16800	18.93
1/26/2018	10:08:22 PM	17100	18.93
1/26/2018	10:13:22 PM	17400	18.93
1/26/2018	10:18:22 PM	17700	18.92
1/26/2018	10:23:22 PM	18000	18.92
1/26/2018	10:28:22 PM	18300	18.92
1/26/2018	10:33:22 PM	18600	18.93
1/26/2018	10:38:22 PM	18900	18.93
1/26/2018	10:43:22 PM	19200	18.93
1/26/2018	10:48:22 PM	19500	18.92
1/26/2018	10:53:22 PM	19800	18.92
1/26/2018	10:58:22 PM	20100	18.92
1/26/2018	11:03:22 PM	20400	18.93
1/26/2018	11:08:22 PM	20700	18.93
1/26/2018	11:13:22 PM	21000	18.92
1/26/2018	11:18:22 PM	21300	18.92
1/26/2018	11:23:22 PM	21600	18.92
1/26/2018	11:28:22 PM	21900	18.93
1/26/2018	11:33:22 PM	22200	18.92
1/26/2018	11:38:22 PM	22500	18.93
1/26/2018	11:43:22 PM	22800	18.92
1/26/2018	11:48:22 PM	23100	18.92
1/26/2018	11:53:22 PM	23400	18.92
1/26/2018	11:58:22 PM	23700	18.92
1/27/2018	12:03:22 AM	24000	18.92
1/27/2018	12:08:22 AM	24300	18.92
1/27/2018	12:13:22 AM	24600	18.93
1/27/2018	12:18:22 AM	24900	18.91
1/27/2018	12:23:22 AM	25200	18.93
1/27/2018	12:28:22 AM	25500	18.92
1/27/2018	12:33:22 AM	25800	18.92
1/27/2018	12:38:22 AM	26100	18.92
1/27/2018	12:43:22 AM	26400	18.92
1/27/2018	12:48:22 AM	26700	18.93

MW-8 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	MW08
1/27/2018	12:53:22 AM	27000	18.92
1/27/2018	12:58:22 AM	27300	18.92
1/27/2018	1:03:22 AM	27600	18.91
1/27/2018	1:08:22 AM	27900	18.93
1/27/2018	1:13:22 AM	28200	18.94
1/27/2018	1:18:22 AM	28500	18.92
1/27/2018	1:23:22 AM	28800	18.92
1/27/2018	1:28:22 AM	29100	18.93
1/27/2018	1:33:22 AM	29400	18.92
1/27/2018	1:38:22 AM	29700	18.93
1/27/2018	1:43:22 AM	30000	18.93
1/27/2018	1:48:22 AM	30300	18.93
1/27/2018	1:53:22 AM	30600	18.93
1/27/2018	1:58:22 AM	30900	18.93
1/27/2018	2:03:22 AM	31200	18.94
1/27/2018	2:08:22 AM	31500	18.93
1/27/2018	2:13:22 AM	31800	18.92
1/27/2018	2:18:22 AM	32100	18.93
1/27/2018	2:23:22 AM	32400	18.93
1/27/2018	2:28:22 AM	32700	18.92
1/27/2018	2:33:22 AM	33000	18.92
1/27/2018	2:38:22 AM	33300	18.93
1/27/2018	2:43:22 AM	33600	18.93
1/27/2018	2:48:22 AM	33900	18.92
1/27/2018	2:53:22 AM	34200	18.92
1/27/2018	2:58:22 AM	34500	18.92
1/27/2018	3:03:22 AM	34800	18.93
1/27/2018	3:08:22 AM	35100	18.92
1/27/2018	3:13:22 AM	35400	18.92
1/27/2018	3:18:22 AM	35700	18.92
1/27/2018	3:23:22 AM	36000	18.93
1/27/2018	3:28:22 AM	36300	18.92
1/27/2018	3:33:22 AM	36600	18.92
1/27/2018	3:38:22 AM	36900	18.92
1/27/2018	3:43:22 AM	37200	18.93
1/27/2018	3:48:22 AM	37500	18.93
1/27/2018	3:53:22 AM	37800	18.92
1/27/2018	3:58:22 AM	38100	18.92
1/27/2018	4:03:22 AM	38400	18.92
1/27/2018	4:08:22 AM	38700	18.92
1/27/2018	4:13:22 AM	39000	18.92
1/27/2018	4:18:22 AM	39300	18.92
1/27/2018	4:23:22 AM	39600	18.92
1/27/2018	4:28:22 AM	39900	18.92
1/27/2018	4:33:22 AM	40200	18.93

MW-8 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	MW08
1/27/2018	4:38:22 AM	40500	18.93
1/27/2018	4:43:22 AM	40800	18.92
1/27/2018	4:48:22 AM	41100	18.92
1/27/2018	4:53:22 AM	41400	18.92
1/27/2018	4:58:22 AM	41700	18.92
1/27/2018	5:03:22 AM	42000	18.92
1/27/2018	5:08:22 AM	42300	18.9
1/27/2018	5:13:22 AM	42600	18.92
1/27/2018	5:18:22 AM	42900	18.92
1/27/2018	5:23:22 AM	43200	18.92
1/27/2018	5:28:22 AM	43500	18.92
1/27/2018	5:33:22 AM	43800	18.92
1/27/2018	5:38:22 AM	44100	18.92
1/27/2018	5:43:22 AM	44400	18.92
1/27/2018	5:48:22 AM	44700	18.92
1/27/2018	5:53:22 AM	45000	18.92
1/27/2018	5:58:22 AM	45300	18.92
1/27/2018	6:03:22 AM	45600	18.92
1/27/2018	6:08:22 AM	45900	18.92
1/27/2018	6:13:22 AM	46200	18.92
1/27/2018	6:18:22 AM	46500	18.92
1/27/2018	6:23:22 AM	46800	18.92
1/27/2018	6:28:22 AM	47100	18.91
1/27/2018	6:33:22 AM	47400	18.92
1/27/2018	6:38:22 AM	47700	18.91
1/27/2018	6:43:22 AM	48000	18.91
1/27/2018	6:48:22 AM	48300	18.92
1/27/2018	6:53:22 AM	48600	18.91
1/27/2018	6:58:22 AM	48900	18.92
1/27/2018	7:03:22 AM	49200	18.92
1/27/2018	7:08:22 AM	49500	18.92
1/27/2018	7:13:22 AM	49800	18.91
1/27/2018	7:18:22 AM	50100	18.92
1/27/2018	7:23:22 AM	50400	18.92
1/27/2018	7:28:22 AM	50700	18.92
1/27/2018	7:33:22 AM	51000	18.92
1/27/2018	7:38:22 AM	51300	18.93
1/27/2018	7:43:22 AM	51600	18.92
1/27/2018	7:48:22 AM	51900	18.92
1/27/2018	7:53:22 AM	52200	18.92
1/27/2018	7:58:22 AM	52500	18.92
1/27/2018	8:03:22 AM	52800	18.93
1/27/2018	8:08:22 AM	53100	18.93
1/27/2018	8:13:22 AM	53400	18.93
1/27/2018	8:18:22 AM	53700	18.93

MW-8 Recovery.xlsm

Date	Time	Elapsed Time (seconds)	MW08
1/27/2018	8:23:22 AM	54000	18.94
1/27/2018	8:28:22 AM	54300	18.94
1/27/2018	8:33:22 AM	54600	18.94
1/27/2018	8:38:22 AM	54900	18.94
1/27/2018	8:43:22 AM	55200	18.93
1/27/2018	8:48:22 AM	55500	18.95
1/27/2018	8:53:22 AM	55800	18.95
1/27/2018	8:58:22 AM	56100	18.94
1/27/2018	9:03:22 AM	56400	18.92
1/27/2018	9:08:22 AM	56700	18.92
1/27/2018	9:13:22 AM	57000	18.92
1/27/2018	9:18:22 AM	57300	18.93
1/27/2018	9:19:55 AM	57393	18.94

STEP TEST DATA

17WW02 Step Test - Adjusted time-date-depth only.txt

Date and Time	Seconds	Level	Depth To Water (ft)
1/23/2018	0	9.14	10:26:00 AM
1/23/2018	10.001	9.14	10:26:00 AM
1/23/2018	20.001	9.14	10:27:00 AM
1/23/2018	30.001	9.14	10:27:00 AM
1/23/2018	40.001	9.14	10:27:00 AM
1/23/2018	50.001	9.14	10:27:00 AM
1/23/2018	60.001	9.14	10:27:00 AM
1/23/2018	70.001	9.14	10:27:00 AM
1/23/2018	80.001	9.14	10:28:00 AM
1/23/2018	90.001	9.14	10:28:00 AM
1/23/2018	100.001	9.14	10:28:00 AM
1/23/2018	110.002	9.14	10:28:00 AM
1/23/2018	120.001	9.14	10:28:00 AM
1/23/2018	130.001	9.14	10:28:00 AM
1/23/2018	140.001	9.14	10:29:00 AM
1/23/2018	150.001	9.14	10:29:00 AM
1/23/2018	160.001	9.14	10:29:00 AM
1/23/2018	170.001	9.14	10:29:00 AM
1/23/2018	180.001	9.14	10:29:00 AM
1/23/2018	190.001	9.14	10:29:00 AM
1/23/2018	200.001	9.14	10:30:00 AM
1/23/2018	210.001	9.14	10:30:00 AM
1/23/2018	220.001	9.14	10:30:00 AM
1/23/2018	230.001	9.14	10:30:00 AM
1/23/2018	240.001	9.14	10:30:00 AM
1/23/2018	250.001	9.14	10:30:00 AM
1/23/2018	260.001	9.14	10:31:00 AM
1/23/2018	270.001	9.14	10:31:00 AM
1/23/2018	280.001	9.15	10:31:00 AM
1/23/2018	290.001	9.14	10:31:00 AM
1/23/2018	300.001	9.14	10:31:00 AM
1/23/2018	310.001	9.14	10:31:00 AM
1/23/2018	320.001	9.14	10:32:00 AM
1/23/2018	330.001	9.14	10:32:00 AM
1/23/2018	340.001	9.14	10:32:00 AM
1/23/2018	350.001	9.14	10:32:00 AM
1/23/2018	360.001	9.14	10:32:00 AM
1/23/2018	370.001	9.14	10:32:00 AM
1/23/2018	380.001	9.14	10:33:00 AM
1/23/2018	390.001	9.14	10:33:00 AM
1/23/2018	400.001	9.14	10:33:00 AM
1/23/2018	410.001	9.15	10:33:00 AM
1/23/2018	420.001	9.14	10:33:00 AM
1/23/2018	430.001	9.15	10:33:00 AM
1/23/2018	440.001	9.14	10:34:00 AM
1/23/2018	450.001	9.14	10:34:00 AM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	460.001	9.15	10:34:00	AM
1/23/2018	470.001	9.14	10:34:00	AM
1/23/2018	480.001	9.15	10:34:00	AM
1/23/2018	980.001	9.8	11:49:00	AM
1/23/2018	990.001	9.81	11:49:00	AM
1/23/2018	1000.001	9.81	11:50:00	AM
1/23/2018	1010.001	9.81	11:50:00	AM
1/23/2018	1020.001	9.81	11:50:00	AM
1/23/2018	1030.001	9.81	11:50:00	AM
1/23/2018	1040.001	9.82	11:50:00	AM
1/23/2018	1050.001	9.82	11:50:00	AM
1/23/2018	1060.001	9.82	11:51:00	AM
1/23/2018	1070.001	9.82	11:51:00	AM
1/23/2018	1080.001	9.83	11:51:00	AM
1/23/2018	1090.001	9.82	11:51:00	AM
1/23/2018	1100.001	9.82	11:51:00	AM
1/23/2018	1110.001	9.82	11:51:00	AM
1/23/2018	1120.001	9.83	11:52:00	AM
1/23/2018	1130.001	9.83	11:52:00	AM
1/23/2018	1140.001	9.83	11:52:00	AM
1/23/2018	1150.001	9.83	11:52:00	AM
1/23/2018	1160.001	9.83	11:52:00	AM
1/23/2018	1170.001	9.83	11:52:00	AM
1/23/2018	1180.001	9.84	11:53:00	AM
1/23/2018	1190.001	9.84	11:53:00	AM
1/23/2018	1200.001	9.84	11:53:00	AM
1/23/2018	1210.001	9.84	11:53:00	AM
1/23/2018	1220.001	9.84	11:53:00	AM
1/23/2018	1230.001	9.85	11:53:00	AM
1/23/2018	1240.001	9.85	11:54:00	AM
1/23/2018	1250.001	9.84	11:54:00	AM
1/23/2018	1260.001	9.85	11:54:00	AM
1/23/2018	1270.001	9.85	11:54:00	AM
1/23/2018	1280.001	9.86	11:54:00	AM
1/23/2018	1290.001	9.86	11:54:00	AM
1/23/2018	1300.001	9.87	11:55:00	AM
1/23/2018	1310.001	9.87	11:55:00	AM
1/23/2018	1320.001	9.88	11:55:00	AM
1/23/2018	1330.001	9.88	11:55:00	AM
1/23/2018	1340.001	9.89	11:55:00	AM
1/23/2018	1350.001	9.89	11:55:00	AM
1/23/2018	1360.001	9.9	11:56:00	AM
1/23/2018	1370.001	9.9	11:56:00	AM
1/23/2018	1380.001	9.91	11:56:00	AM
1/23/2018	1390.001	9.91	11:56:00	AM
1/23/2018	1400.001	9.91	11:56:00	AM
1/23/2018	1410.001	9.92	11:56:00	AM
1/23/2018	1420.001	9.92	11:57:00	AM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	1430.001	9.92	11:57:00 AM
1/23/2018	1440.001	9.93	11:57:00 AM
1/23/2018	1450.001	9.93	11:57:00 AM
1/23/2018	1460.001	9.93	11:57:00 AM
1/23/2018	1470.001	9.94	11:57:00 AM
1/23/2018	1480.001	9.94	11:58:00 AM
1/23/2018	1490.001	9.95	11:58:00 AM
1/23/2018	1500.007	9.95	11:58:00 AM
1/23/2018	1510.001	9.96	11:58:00 AM
1/23/2018	1520.001	9.97	11:58:00 AM
1/23/2018	1530.001	9.98	11:58:00 AM
1/23/2018	1540.001	9.98	11:59:00 AM
1/23/2018	1550.001	9.99	11:59:00 AM
1/23/2018	1560.001	10	11:59:00 AM
1/23/2018	1570.001	10.01	11:59:00 AM
1/23/2018	1580.001	10	11:59:00 AM
1/23/2018	1590.001	10.02	11:59:00 AM
1/23/2018	1600.001	10.02	12:00:00 PM
1/23/2018	1610.001	10.03	12:00:00 PM
1/23/2018	1620.001	10.05	12:00:00 PM
1/23/2018	1630.001	10.05	12:00:00 PM
1/23/2018	1640.001	10.06	12:00:00 PM
1/23/2018	1650.001	10.06	12:00:00 PM
1/23/2018	1660.001	10.07	12:01:00 PM
1/23/2018	1670.001	10.07	12:01:00 PM
1/23/2018	1680.001	10.08	12:01:00 PM
1/23/2018	1690.001	10.08	12:01:00 PM
1/23/2018	1700.001	10.09	12:01:00 PM
1/23/2018	1710.001	10.1	12:01:00 PM
1/23/2018	1720.001	10.1	12:02:00 PM
1/23/2018	1730.001	10.11	12:02:00 PM
1/23/2018	1740.001	10.12	12:02:00 PM
1/23/2018	1750.001	10.13	12:02:00 PM
1/23/2018	1760.001	10.14	12:02:00 PM
1/23/2018	1770.001	10.14	12:02:00 PM
1/23/2018	1780.001	10.15	12:03:00 PM
1/23/2018	1790.001	10.16	12:03:00 PM
1/23/2018	1800.001	10.17	12:03:00 PM
1/23/2018	1810.001	10.17	12:03:00 PM
1/23/2018	1820.001	10.18	12:03:00 PM
1/23/2018	1830.001	10.19	12:03:00 PM
1/23/2018	1840.001	10.2	12:04:00 PM
1/23/2018	1850.001	10.21	12:04:00 PM
1/23/2018	1860.001	10.22	12:04:00 PM
1/23/2018	1870.001	10.23	12:04:00 PM
1/23/2018	1880.001	10.23	12:04:00 PM
1/23/2018	1890.001	10.24	12:04:00 PM
1/23/2018	1900.001	10.25	12:05:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	1910.001	10.25	12:05:00 PM
1/23/2018	1920.001	10.26	12:05:00 PM
1/23/2018	1930.001	10.27	12:05:00 PM
1/23/2018	1940.001	10.27	12:05:00 PM
1/23/2018	1950.001	10.28	12:05:00 PM
1/23/2018	1960.001	10.29	12:06:00 PM
1/23/2018	1970.001	10.29	12:06:00 PM
1/23/2018	1980.001	10.29	12:06:00 PM
1/23/2018	1990.001	10.31	12:06:00 PM
1/23/2018	2000.001	10.31	12:06:00 PM
1/23/2018	2010.001	10.31	12:06:00 PM
1/23/2018	2020.001	10.31	12:07:00 PM
1/23/2018	2030.001	10.32	12:07:00 PM
1/23/2018	2040.001	10.32	12:07:00 PM
1/23/2018	2050.001	10.32	12:07:00 PM
1/23/2018	2060.001	10.33	12:07:00 PM
1/23/2018	2070.001	10.33	12:07:00 PM
1/23/2018	2080.001	10.33	12:08:00 PM
1/23/2018	2090.001	10.33	12:08:00 PM
1/23/2018	2100.001	10.33	12:08:00 PM
1/23/2018	2110.001	10.34	12:08:00 PM
1/23/2018	2120.001	10.34	12:08:00 PM
1/23/2018	2130.001	10.35	12:08:00 PM
1/23/2018	2140.001	10.35	12:09:00 PM
1/23/2018	2150.001	10.34	12:09:00 PM
1/23/2018	2160.001	10.35	12:09:00 PM
1/23/2018	2170.001	10.35	12:09:00 PM
1/23/2018	2180.001	10.35	12:09:00 PM
1/23/2018	2190.001	10.35	12:09:00 PM
1/23/2018	2200.001	10.36	12:10:00 PM
1/23/2018	2210.001	10.36	12:10:00 PM
1/23/2018	2220.001	10.36	12:10:00 PM
1/23/2018	2230.001	10.37	12:10:00 PM
1/23/2018	2240.001	10.37	12:10:00 PM
1/23/2018	2250.001	10.38	12:10:00 PM
1/23/2018	2260.001	10.39	12:11:00 PM
1/23/2018	2270.001	10.4	12:11:00 PM
1/23/2018	2280.001	10.41	12:11:00 PM
1/23/2018	2290.001	10.43	12:11:00 PM
1/23/2018	2300.001	10.43	12:11:00 PM
1/23/2018	2310.001	10.45	12:11:00 PM
1/23/2018	2320.001	10.46	12:12:00 PM
1/23/2018	2330.001	10.47	12:12:00 PM
1/23/2018	2340.002	10.48	12:12:00 PM
1/23/2018	2350.001	10.48	12:12:00 PM
1/23/2018	2360.001	10.5	12:12:00 PM
1/23/2018	2370.001	10.51	12:12:00 PM
1/23/2018	2380.001	10.51	12:13:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	2390.001	10.53	12:13:00 PM
1/23/2018	2400.001	10.53	12:13:00 PM
1/23/2018	2410.001	10.54	12:13:00 PM
1/23/2018	2420.001	10.55	12:13:00 PM
1/23/2018	2430.001	10.55	12:13:00 PM
1/23/2018	2440.001	10.56	12:14:00 PM
1/23/2018	2450.001	10.57	12:14:00 PM
1/23/2018	2460.001	10.57	12:14:00 PM
1/23/2018	2470.001	10.58	12:14:00 PM
1/23/2018	2480.001	10.58	12:14:00 PM
1/23/2018	2490.001	10.59	12:14:00 PM
1/23/2018	2500.001	10.59	12:15:00 PM
1/23/2018	2510.001	10.6	12:15:00 PM
1/23/2018	2520.001	10.6	12:15:00 PM
1/23/2018	2530.001	10.6	12:15:00 PM
1/23/2018	2540.001	10.62	12:15:00 PM
1/23/2018	2550.001	10.62	12:15:00 PM
1/23/2018	2560.001	10.64	12:16:00 PM
1/23/2018	2570.001	10.64	12:16:00 PM
1/23/2018	2580.001	10.65	12:16:00 PM
1/23/2018	2590.001	10.66	12:16:00 PM
1/23/2018	2600.001	10.66	12:16:00 PM
1/23/2018	2610.001	10.67	12:16:00 PM
1/23/2018	2620.001	10.68	12:17:00 PM
1/23/2018	2630.001	10.68	12:17:00 PM
1/23/2018	2640.001	10.69	12:17:00 PM
1/23/2018	2650.001	10.69	12:17:00 PM
1/23/2018	2660.001	10.7	12:17:00 PM
1/23/2018	2670.001	10.7	12:17:00 PM
1/23/2018	2680.001	10.71	12:18:00 PM
1/23/2018	2690.001	10.72	12:18:00 PM
1/23/2018	2700.001	10.72	12:18:00 PM
1/23/2018	2710.001	10.72	12:18:00 PM
1/23/2018	2720.001	10.73	12:18:00 PM
1/23/2018	2730.001	10.73	12:18:00 PM
1/23/2018	2740.001	10.74	12:19:00 PM
1/23/2018	2750.001	10.74	12:19:00 PM
1/23/2018	2760.001	10.75	12:19:00 PM
1/23/2018	2770.001	10.75	12:19:00 PM
1/23/2018	2780.001	10.75	12:19:00 PM
1/23/2018	2790.001	10.76	12:19:00 PM
1/23/2018	2800.001	10.76	12:20:00 PM
1/23/2018	2810.001	10.77	12:20:00 PM
1/23/2018	2820.001	10.78	12:20:00 PM
1/23/2018	2830.004	10.78	12:20:00 PM
1/23/2018	2840.001	10.78	12:20:00 PM
1/23/2018	2850.001	10.79	12:20:00 PM
1/23/2018	2860.001	10.79	12:21:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	2870.001	10.8	12:21:00 PM
1/23/2018	2880.001	10.8	12:21:00 PM
1/23/2018	2890.001	10.8	12:21:00 PM
1/23/2018	2900.001	10.81	12:21:00 PM
1/23/2018	2910.001	10.81	12:21:00 PM
1/23/2018	2920.001	10.81	12:22:00 PM
1/23/2018	2930.001	10.82	12:22:00 PM
1/23/2018	2940.001	10.82	12:22:00 PM
1/23/2018	2950.001	10.83	12:22:00 PM
1/23/2018	2960.001	10.83	12:22:00 PM
1/23/2018	2970.001	10.84	12:22:00 PM
1/23/2018	2980.001	10.84	12:23:00 PM
1/23/2018	2990.001	10.85	12:23:00 PM
1/23/2018	3000.001	10.85	12:23:00 PM
1/23/2018	3010.001	10.86	12:23:00 PM
1/23/2018	3020.001	10.86	12:23:00 PM
1/23/2018	3030.001	10.86	12:23:00 PM
1/23/2018	3040.001	10.86	12:24:00 PM
1/23/2018	3050.004	10.87	12:24:00 PM
1/23/2018	3060.001	10.87	12:24:00 PM
1/23/2018	3070.001	10.88	12:24:00 PM
1/23/2018	3080.001	10.88	12:24:00 PM
1/23/2018	3090.001	10.88	12:24:00 PM
1/23/2018	3100.001	10.89	12:25:00 PM
1/23/2018	3110.001	10.89	12:25:00 PM
1/23/2018	3120.001	10.89	12:25:00 PM
1/23/2018	3130.001	10.89	12:25:00 PM
1/23/2018	3140.001	10.9	12:25:00 PM
1/23/2018	3150.001	10.9	12:25:00 PM
1/23/2018	3160.001	10.9	12:26:00 PM
1/23/2018	3170.001	10.91	12:26:00 PM
1/23/2018	3180.001	10.91	12:26:00 PM
1/23/2018	3190.001	10.91	12:26:00 PM
1/23/2018	3200.001	10.92	12:26:00 PM
1/23/2018	3210.001	10.92	12:26:00 PM
1/23/2018	3220.001	10.93	12:27:00 PM
1/23/2018	3230.001	10.93	12:27:00 PM
1/23/2018	3240.001	10.93	12:27:00 PM
1/23/2018	3250.001	10.93	12:27:00 PM
1/23/2018	3260.001	10.94	12:27:00 PM
1/23/2018	3270.001	10.94	12:27:00 PM
1/23/2018	3280.001	10.95	12:28:00 PM
1/23/2018	3290.001	10.95	12:28:00 PM
1/23/2018	3300.001	10.95	12:28:00 PM
1/23/2018	3310.001	10.95	12:28:00 PM
1/23/2018	3320.001	10.96	12:28:00 PM
1/23/2018	3330.001	10.96	12:28:00 PM
1/23/2018	3340.001	10.97	12:29:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	3350.001	10.97	12:29:00 PM
1/23/2018	3360.001	10.97	12:29:00 PM
1/23/2018	3370.001	10.97	12:29:00 PM
1/23/2018	3380.001	10.98	12:29:00 PM
1/23/2018	3390.001	10.98	12:29:00 PM
1/23/2018	3400.001	10.99	12:30:00 PM
1/23/2018	3410.001	10.99	12:30:00 PM
1/23/2018	3420.001	10.99	12:30:00 PM
1/23/2018	3430.001	10.99	12:30:00 PM
1/23/2018	3440.001	10.99	12:30:00 PM
1/23/2018	3450.001	11	12:30:00 PM
1/23/2018	3460.001	11	12:31:00 PM
1/23/2018	3470.001	11	12:31:00 PM
1/23/2018	3480.001	11	12:31:00 PM
1/23/2018	3490.001	11	12:31:00 PM
1/23/2018	3500.001	11.01	12:31:00 PM
1/23/2018	3510.001	11.01	12:31:00 PM
1/23/2018	3520.001	11.01	12:32:00 PM
1/23/2018	3530.001	11.01	12:32:00 PM
1/23/2018	3540.001	11.01	12:32:00 PM
1/23/2018	3550.001	11.01	12:32:00 PM
1/23/2018	3560.001	11.01	12:32:00 PM
1/23/2018	3570.001	11	12:32:00 PM
1/23/2018	3580.001	11.01	12:33:00 PM
1/23/2018	3590.001	11.01	12:33:00 PM
1/23/2018	3600.001	11.01	12:33:00 PM
1/23/2018	3610.001	11.01	12:33:00 PM
1/23/2018	3620.001	11.02	12:33:00 PM
1/23/2018	3630.001	11.02	12:33:00 PM
1/23/2018	3640.001	11.02	12:34:00 PM
1/23/2018	3650.001	11.03	12:34:00 PM
1/23/2018	3660.001	11.03	12:34:00 PM
1/23/2018	3670.001	11.03	12:34:00 PM
1/23/2018	3680.001	11.03	12:34:00 PM
1/23/2018	3690.001	11.03	12:34:00 PM
1/23/2018	3700.001	11.04	12:35:00 PM
1/23/2018	3710.001	11.04	12:35:00 PM
1/23/2018	3720.001	11.04	12:35:00 PM
1/23/2018	3730.001	11.04	12:35:00 PM
1/23/2018	3740.001	11.04	12:35:00 PM
1/23/2018	3750.001	11.04	12:35:00 PM
1/23/2018	3760.001	11.05	12:36:00 PM
1/23/2018	3770.001	11.05	12:36:00 PM
1/23/2018	3780.001	11.04	12:36:00 PM
1/23/2018	3790.001	11.05	12:36:00 PM
1/23/2018	3800.001	11.04	12:36:00 PM
1/23/2018	3810.001	11.05	12:36:00 PM
1/23/2018	3820.001	11.05	12:37:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	3830.001	11.05	12:37:00 PM
1/23/2018	3840.001	11.05	12:37:00 PM
1/23/2018	3850.001	11.06	12:37:00 PM
1/23/2018	3860.001	11.06	12:37:00 PM
1/23/2018	3870.001	11.06	12:37:00 PM
1/23/2018	3880.001	11.07	12:38:00 PM
1/23/2018	3890.001	11.07	12:38:00 PM
1/23/2018	3900.001	11.06	12:38:00 PM
1/23/2018	3910.001	11.06	12:38:00 PM
1/23/2018	3920.001	11.07	12:38:00 PM
1/23/2018	3930.001	11.06	12:38:00 PM
1/23/2018	3940.001	11.06	12:39:00 PM
1/23/2018	3950.001	11.07	12:39:00 PM
1/23/2018	3960.001	11.07	12:39:00 PM
1/23/2018	3970.001	11.07	12:39:00 PM
1/23/2018	3980.001	11.07	12:39:00 PM
1/23/2018	3990.001	11.07	12:39:00 PM
1/23/2018	4000.001	11.07	12:40:00 PM
1/23/2018	4010.001	11.07	12:40:00 PM
1/23/2018	4020.001	11.08	12:40:00 PM
1/23/2018	4030.001	11.07	12:40:00 PM
1/23/2018	4040.001	11.07	12:40:00 PM
1/23/2018	4050.001	11.08	12:40:00 PM
1/23/2018	4060.001	11.08	12:41:00 PM
1/23/2018	4070.001	11.08	12:41:00 PM
1/23/2018	4080.001	11.08	12:41:00 PM
1/23/2018	4090.001	11.09	12:41:00 PM
1/23/2018	4100.001	11.09	12:41:00 PM
1/23/2018	4110.001	11.09	12:41:00 PM
1/23/2018	4120.001	11.1	12:42:00 PM
1/23/2018	4130.001	11.09	12:42:00 PM
1/23/2018	4140.001	11.09	12:42:00 PM
1/23/2018	4150.001	11.09	12:42:00 PM
1/23/2018	4160.001	11.09	12:42:00 PM
1/23/2018	4170.001	11.09	12:42:00 PM
1/23/2018	4180.001	11.09	12:43:00 PM
1/23/2018	4190.001	11.09	12:43:00 PM
1/23/2018	4200.001	11.1	12:43:00 PM
1/23/2018	4210.001	11.1	12:43:00 PM
1/23/2018	4220.001	11.1	12:43:00 PM
1/23/2018	4230.001	11.09	12:43:00 PM
1/23/2018	4240.001	11.1	12:44:00 PM
1/23/2018	4250.001	11.1	12:44:00 PM
1/23/2018	4260.001	11.1	12:44:00 PM
1/23/2018	4270.001	11.1	12:44:00 PM
1/23/2018	4280.001	11.1	12:44:00 PM
1/23/2018	4290.001	11.11	12:44:00 PM
1/23/2018	4300.001	11.11	12:45:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	4310.001	11.1	12:45:00 PM
1/23/2018	4320.001	11.1	12:45:00 PM
1/23/2018	4330.001	11.1	12:45:00 PM
1/23/2018	4340.001	11.1	12:45:00 PM
1/23/2018	4350.001	11.1	12:45:00 PM
1/23/2018	4360.001	11.11	12:46:00 PM
1/23/2018	4370.001	11.11	12:46:00 PM
1/23/2018	4380.001	11.11	12:46:00 PM
1/23/2018	4390.001	11.11	12:46:00 PM
1/23/2018	4400.001	11.12	12:46:00 PM
1/23/2018	4410.001	11.12	12:46:00 PM
1/23/2018	4420.001	11.12	12:47:00 PM
1/23/2018	4430.001	11.12	12:47:00 PM
1/23/2018	4440.001	11.12	12:47:00 PM
1/23/2018	4450.001	11.12	12:47:00 PM
1/23/2018	4460.001	11.13	12:47:00 PM
1/23/2018	4470.001	11.12	12:47:00 PM
1/23/2018	4480.001	11.13	12:48:00 PM
1/23/2018	4490.001	11.13	12:48:00 PM
1/23/2018	4500.001	11.13	12:48:00 PM
1/23/2018	4510.001	11.13	12:48:00 PM
1/23/2018	4520.001	11.14	12:48:00 PM
1/23/2018	4530.001	11.13	12:48:00 PM
1/23/2018	4540.001	11.14	12:49:00 PM
1/23/2018	4550.001	11.14	12:49:00 PM
1/23/2018	4560.001	11.14	12:49:00 PM
1/23/2018	4570.001	11.14	12:49:00 PM
1/23/2018	4580.001	11.14	12:49:00 PM
1/23/2018	4590.001	11.15	12:49:00 PM
1/23/2018	4600.001	11.14	12:50:00 PM
1/23/2018	4610.001	11.14	12:50:00 PM
1/23/2018	4620.001	11.14	12:50:00 PM
1/23/2018	4630.001	11.15	12:50:00 PM
1/23/2018	4640.001	11.15	12:50:00 PM
1/23/2018	4650.001	11.15	12:50:00 PM
1/23/2018	4660.001	11.15	12:51:00 PM
1/23/2018	4670.001	11.15	12:51:00 PM
1/23/2018	4680.001	11.15	12:51:00 PM
1/23/2018	4690.001	11.15	12:51:00 PM
1/23/2018	4700.001	11.15	12:51:00 PM
1/23/2018	4710.001	11.15	12:51:00 PM
1/23/2018	4720.001	11.15	12:52:00 PM
1/23/2018	4730.001	11.15	12:52:00 PM
1/23/2018	4740.001	11.14	12:52:00 PM
1/23/2018	4750.004	11.15	12:52:00 PM
1/23/2018	4760.003	11.15	12:52:00 PM
1/23/2018	4770.001	11.16	12:52:00 PM
1/23/2018	4780.001	11.18	12:53:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	4790.001	11.25	12:53:00 PM
1/23/2018	4800.001	11.3	12:53:00 PM
1/23/2018	4810.001	11.38	12:53:00 PM
1/23/2018	4820.001	11.42	12:53:00 PM
1/23/2018	4830.001	11.47	12:53:00 PM
1/23/2018	4840.001	11.54	12:54:00 PM
1/23/2018	4850.001	11.6	12:54:00 PM
1/23/2018	4860.001	11.64	12:54:00 PM
1/23/2018	4870.001	11.68	12:54:00 PM
1/23/2018	4880.001	11.73	12:54:00 PM
1/23/2018	4890.001	11.78	12:54:00 PM
1/23/2018	4900.001	11.81	12:55:00 PM
1/23/2018	4910.001	11.85	12:55:00 PM
1/23/2018	4920.001	11.89	12:55:00 PM
1/23/2018	4930.001	11.94	12:55:00 PM
1/23/2018	4940.001	11.98	12:55:00 PM
1/23/2018	4950.001	12.02	12:55:00 PM
1/23/2018	4960.001	12.05	12:56:00 PM
1/23/2018	4970.001	12.1	12:56:00 PM
1/23/2018	4980.001	12.14	12:56:00 PM
1/23/2018	4990.001	12.18	12:56:00 PM
1/23/2018	5000.001	12.21	12:56:00 PM
1/23/2018	5010.001	12.24	12:56:00 PM
1/23/2018	5020.001	12.28	12:57:00 PM
1/23/2018	5030.001	12.31	12:57:00 PM
1/23/2018	5040.001	12.34	12:57:00 PM
1/23/2018	5050.001	12.36	12:57:00 PM
1/23/2018	5060.001	12.39	12:57:00 PM
1/23/2018	5070.001	12.43	12:57:00 PM
1/23/2018	5080.001	12.46	12:58:00 PM
1/23/2018	5090.001	12.49	12:58:00 PM
1/23/2018	5100.001	12.51	12:58:00 PM
1/23/2018	5110.001	12.54	12:58:00 PM
1/23/2018	5120.001	12.57	12:58:00 PM
1/23/2018	5130.001	12.59	12:58:00 PM
1/23/2018	5140.001	12.62	12:59:00 PM
1/23/2018	5150.001	12.65	12:59:00 PM
1/23/2018	5160.001	12.67	12:59:00 PM
1/23/2018	5170.001	12.7	12:59:00 PM
1/23/2018	5180.001	12.72	12:59:00 PM
1/23/2018	5190.001	12.73	12:59:00 PM
1/23/2018	5200.003	12.75	1:00:00 PM
1/23/2018	5210.002	12.75	1:00:00 PM
1/23/2018	5220.001	12.76	1:00:00 PM
1/23/2018	5230.001	12.77	1:00:00 PM
1/23/2018	5240.001	12.78	1:00:00 PM
1/23/2018	5250.001	12.78	1:00:00 PM
1/23/2018	5260.001	12.79	1:01:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	5270.001	12.79	1:01:00 PM
1/23/2018	5280.001	12.8	1:01:00 PM
1/23/2018	5290.001	12.82	1:01:00 PM
1/23/2018	5300.001	12.82	1:01:00 PM
1/23/2018	5310.001	12.82	1:01:00 PM
1/23/2018	5320.001	12.8	1:02:00 PM
1/23/2018	5330.001	12.79	1:02:00 PM
1/23/2018	5340.001	12.77	1:02:00 PM
1/23/2018	5350.001	12.75	1:02:00 PM
1/23/2018	5360.001	12.73	1:02:00 PM
1/23/2018	5370.001	12.72	1:02:00 PM
1/23/2018	5380.001	12.7	1:03:00 PM
1/23/2018	5390.001	12.69	1:03:00 PM
1/23/2018	5400.001	12.67	1:03:00 PM
1/23/2018	5410.001	12.65	1:03:00 PM
1/23/2018	5420.001	12.64	1:03:00 PM
1/23/2018	5430.001	12.63	1:03:00 PM
1/23/2018	5440.001	12.61	1:04:00 PM
1/23/2018	5450.001	12.59	1:04:00 PM
1/23/2018	5460.001	12.55	1:04:00 PM
1/23/2018	5470.001	12.53	1:04:00 PM
1/23/2018	5480.001	12.52	1:04:00 PM
1/23/2018	5490.001	12.5	1:04:00 PM
1/23/2018	5500.001	12.48	1:05:00 PM
1/23/2018	5510.001	12.47	1:05:00 PM
1/23/2018	5520.001	12.45	1:05:00 PM
1/23/2018	5530.001	12.44	1:05:00 PM
1/23/2018	5540.001	12.42	1:05:00 PM
1/23/2018	5550.001	12.41	1:05:00 PM
1/23/2018	5560.001	12.39	1:06:00 PM
1/23/2018	5570.001	12.38	1:06:00 PM
1/23/2018	5580.001	12.37	1:06:00 PM
1/23/2018	5590.001	12.36	1:06:00 PM
1/23/2018	5600.001	12.34	1:06:00 PM
1/23/2018	5610.001	12.33	1:06:00 PM
1/23/2018	5620.001	12.33	1:07:00 PM
1/23/2018	5630.001	12.33	1:07:00 PM
1/23/2018	5640.001	12.34	1:07:00 PM
1/23/2018	5650.001	12.33	1:07:00 PM
1/23/2018	5660.001	12.33	1:07:00 PM
1/23/2018	5670.001	12.33	1:07:00 PM
1/23/2018	5680.001	12.33	1:08:00 PM
1/23/2018	5690.001	12.33	1:08:00 PM
1/23/2018	5700.001	12.33	1:08:00 PM
1/23/2018	5710.001	12.33	1:08:00 PM
1/23/2018	5720.001	12.32	1:08:00 PM
1/23/2018	5730.001	12.32	1:08:00 PM
1/23/2018	5740.003	12.32	1:09:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	5750.003	12.32	1:09:00 PM
1/23/2018	5760.001	12.32	1:09:00 PM
1/23/2018	5770.001	12.32	1:09:00 PM
1/23/2018	5780.001	12.32	1:09:00 PM
1/23/2018	5790.001	12.32	1:09:00 PM
1/23/2018	5800.001	12.32	1:10:00 PM
1/23/2018	5810.001	12.32	1:10:00 PM
1/23/2018	5820.001	12.32	1:10:00 PM
1/23/2018	5830.001	12.32	1:10:00 PM
1/23/2018	5840.001	12.32	1:10:00 PM
1/23/2018	5850.001	12.31	1:10:00 PM
1/23/2018	5860.001	12.32	1:11:00 PM
1/23/2018	5870.001	12.32	1:11:00 PM
1/23/2018	5880.001	12.32	1:11:00 PM
1/23/2018	5890.001	12.32	1:11:00 PM
1/23/2018	5900.001	12.32	1:11:00 PM
1/23/2018	5910.001	12.32	1:11:00 PM
1/23/2018	5920.001	12.32	1:12:00 PM
1/23/2018	5930.001	12.32	1:12:00 PM
1/23/2018	5940.001	12.31	1:12:00 PM
1/23/2018	5950.001	12.31	1:12:00 PM
1/23/2018	5960.001	12.31	1:12:00 PM
1/23/2018	5970.001	12.31	1:12:00 PM
1/23/2018	5980.001	12.31	1:13:00 PM
1/23/2018	5990.001	12.3	1:13:00 PM
1/23/2018	6000.001	12.31	1:13:00 PM
1/23/2018	6010.001	12.31	1:13:00 PM
1/23/2018	6020.001	12.31	1:13:00 PM
1/23/2018	6030.001	12.31	1:13:00 PM
1/23/2018	6040.001	12.31	1:14:00 PM
1/23/2018	6050.001	12.3	1:14:00 PM
1/23/2018	6060.001	12.3	1:14:00 PM
1/23/2018	6070.001	12.32	1:14:00 PM
1/23/2018	6080.001	12.34	1:14:00 PM
1/23/2018	6090.001	12.38	1:14:00 PM
1/23/2018	6100.001	12.41	1:15:00 PM
1/23/2018	6110.001	12.44	1:15:00 PM
1/23/2018	6120.001	12.47	1:15:00 PM
1/23/2018	6130.001	12.5	1:15:00 PM
1/23/2018	6140.001	12.53	1:15:00 PM
1/23/2018	6150.001	12.56	1:15:00 PM
1/23/2018	6160.001	12.59	1:16:00 PM
1/23/2018	6170.001	12.62	1:16:00 PM
1/23/2018	6180.001	12.64	1:16:00 PM
1/23/2018	6190.001	12.67	1:16:00 PM
1/23/2018	6200.001	12.69	1:16:00 PM
1/23/2018	6210.001	12.72	1:16:00 PM
1/23/2018	6220.001	12.74	1:17:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	6230.001	12.76	1:17:00 PM
1/23/2018	6240.001	12.78	1:17:00 PM
1/23/2018	6250.001	12.81	1:17:00 PM
1/23/2018	6260.001	12.83	1:17:00 PM
1/23/2018	6270.001	12.85	1:17:00 PM
1/23/2018	6280.001	12.88	1:18:00 PM
1/23/2018	6290.001	12.9	1:18:00 PM
1/23/2018	6300.001	12.91	1:18:00 PM
1/23/2018	6310.001	12.94	1:18:00 PM
1/23/2018	6320.001	12.96	1:18:00 PM
1/23/2018	6330.001	12.98	1:18:00 PM
1/23/2018	6340.001	12.99	1:19:00 PM
1/23/2018	6350.001	13.01	1:19:00 PM
1/23/2018	6360.001	13.03	1:19:00 PM
1/23/2018	6370.001	13.05	1:19:00 PM
1/23/2018	6380.001	13.07	1:19:00 PM
1/23/2018	6390.001	13.09	1:19:00 PM
1/23/2018	6400.001	13.12	1:20:00 PM
1/23/2018	6410.001	13.16	1:20:00 PM
1/23/2018	6420.001	13.19	1:20:00 PM
1/23/2018	6430.001	13.23	1:20:00 PM
1/23/2018	6440.001	13.26	1:20:00 PM
1/23/2018	6450.001	13.29	1:20:00 PM
1/23/2018	6460.001	13.32	1:21:00 PM
1/23/2018	6470.001	13.36	1:21:00 PM
1/23/2018	6480.001	13.39	1:21:00 PM
1/23/2018	6490.001	13.42	1:21:00 PM
1/23/2018	6500.001	13.45	1:21:00 PM
1/23/2018	6510.001	13.48	1:21:00 PM
1/23/2018	6520.001	13.5	1:22:00 PM
1/23/2018	6530.001	13.54	1:22:00 PM
1/23/2018	6540.001	13.58	1:22:00 PM
1/23/2018	6550.001	13.62	1:22:00 PM
1/23/2018	6560.001	13.66	1:22:00 PM
1/23/2018	6570.001	13.69	1:22:00 PM
1/23/2018	6580.001	13.73	1:23:00 PM
1/23/2018	6590.001	13.75	1:23:00 PM
1/23/2018	6600.001	13.79	1:23:00 PM
1/23/2018	6610.001	13.82	1:23:00 PM
1/23/2018	6620.001	13.86	1:23:00 PM
1/23/2018	6630.001	13.89	1:23:00 PM
1/23/2018	6640.001	13.92	1:24:00 PM
1/23/2018	6650.001	13.95	1:24:00 PM
1/23/2018	6660.001	13.98	1:24:00 PM
1/23/2018	6670.001	14.02	1:24:00 PM
1/23/2018	6680.001	14.06	1:24:00 PM
1/23/2018	6690.001	14.09	1:24:00 PM
1/23/2018	6700.001	14.14	1:25:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	6710.001	14.18	1:25:00 PM
1/23/2018	6720.001	14.22	1:25:00 PM
1/23/2018	6730.001	14.27	1:25:00 PM
1/23/2018	6740.001	14.31	1:25:00 PM
1/23/2018	6750.001	14.35	1:25:00 PM
1/23/2018	6760.001	14.39	1:26:00 PM
1/23/2018	6770.001	14.42	1:26:00 PM
1/23/2018	6780.001	14.46	1:26:00 PM
1/23/2018	6790.001	14.5	1:26:00 PM
1/23/2018	6800.001	14.53	1:26:00 PM
1/23/2018	6810.001	14.57	1:26:00 PM
1/23/2018	6820.001	14.6	1:27:00 PM
1/23/2018	6830.001	14.64	1:27:00 PM
1/23/2018	6840.001	14.69	1:27:00 PM
1/23/2018	6850.001	14.75	1:27:00 PM
1/23/2018	6860.001	14.8	1:27:00 PM
1/23/2018	6870.001	14.84	1:27:00 PM
1/23/2018	6880.001	14.89	1:28:00 PM
1/23/2018	6890.001	14.93	1:28:00 PM
1/23/2018	6900.001	14.98	1:28:00 PM
1/23/2018	6910.001	15.03	1:28:00 PM
1/23/2018	6920.001	15.08	1:28:00 PM
1/23/2018	6930.001	15.12	1:28:00 PM
1/23/2018	6940.001	15.16	1:29:00 PM
1/23/2018	6950.001	15.2	1:29:00 PM
1/23/2018	6960.001	15.24	1:29:00 PM
1/23/2018	6970.001	15.28	1:29:00 PM
1/23/2018	6980.001	15.32	1:29:00 PM
1/23/2018	6990.001	15.36	1:29:00 PM
1/23/2018	7000.001	15.38	1:30:00 PM
1/23/2018	7010.001	15.41	1:30:00 PM
1/23/2018	7020.001	15.42	1:30:00 PM
1/23/2018	7030.001	15.41	1:30:00 PM
1/23/2018	7040.001	15.43	1:30:00 PM
1/23/2018	7050.001	15.43	1:30:00 PM
1/23/2018	7060.001	15.43	1:31:00 PM
1/23/2018	7070.001	15.43	1:31:00 PM
1/23/2018	7080.001	15.44	1:31:00 PM
1/23/2018	7090.001	15.44	1:31:00 PM
1/23/2018	7100.001	15.44	1:31:00 PM
1/23/2018	7110.001	15.44	1:31:00 PM
1/23/2018	7120.001	15.43	1:32:00 PM
1/23/2018	7130.001	15.43	1:32:00 PM
1/23/2018	7140.001	15.43	1:32:00 PM
1/23/2018	7150.001	15.43	1:32:00 PM
1/23/2018	7160.001	15.43	1:32:00 PM
1/23/2018	7170.001	15.43	1:32:00 PM
1/23/2018	7180.001	15.43	1:33:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	7190.001	15.43	1:33:00 PM
1/23/2018	7200.001	15.43	1:33:00 PM
1/23/2018	7210.001	15.44	1:33:00 PM
1/23/2018	7220.001	15.44	1:33:00 PM
1/23/2018	7230.001	15.44	1:33:00 PM
1/23/2018	7240.001	15.44	1:34:00 PM
1/23/2018	7250.001	15.44	1:34:00 PM
1/23/2018	7260.001	15.44	1:34:00 PM
1/23/2018	7270.001	15.44	1:34:00 PM
1/23/2018	7280.001	15.44	1:34:00 PM
1/23/2018	7290.001	15.44	1:34:00 PM
1/23/2018	7300.001	15.44	1:35:00 PM
1/23/2018	7310.001	15.43	1:35:00 PM
1/23/2018	7320.001	15.43	1:35:00 PM
1/23/2018	7330.001	15.43	1:35:00 PM
1/23/2018	7340.001	15.44	1:35:00 PM
1/23/2018	7350.001	15.44	1:35:00 PM
1/23/2018	7360.001	15.43	1:36:00 PM
1/23/2018	7370.001	15.43	1:36:00 PM
1/23/2018	7380.001	15.43	1:36:00 PM
1/23/2018	7390.001	15.43	1:36:00 PM
1/23/2018	7400.001	15.43	1:36:00 PM
1/23/2018	7410.001	15.43	1:36:00 PM
1/23/2018	7420.001	15.43	1:37:00 PM
1/23/2018	7430.001	15.44	1:37:00 PM
1/23/2018	7440.001	15.43	1:37:00 PM
1/23/2018	7450.001	15.43	1:37:00 PM
1/23/2018	7460.001	15.43	1:37:00 PM
1/23/2018	7470.001	15.42	1:37:00 PM
1/23/2018	7480.001	15.43	1:38:00 PM
1/23/2018	7490.001	15.43	1:38:00 PM
1/23/2018	7500.001	15.43	1:38:00 PM
1/23/2018	7510.001	15.44	1:38:00 PM
1/23/2018	7520.001	15.43	1:38:00 PM
1/23/2018	7530.001	15.43	1:38:00 PM
1/23/2018	7540.001	15.43	1:39:00 PM
1/23/2018	7550.001	15.43	1:39:00 PM
1/23/2018	7560.001	15.43	1:39:00 PM
1/23/2018	7570.001	15.44	1:39:00 PM
1/23/2018	7580.001	15.43	1:39:00 PM
1/23/2018	7590.001	15.42	1:39:00 PM
1/23/2018	7600.001	15.43	1:40:00 PM
1/23/2018	7610.001	15.43	1:40:00 PM
1/23/2018	7620.001	15.42	1:40:00 PM
1/23/2018	7630.001	15.42	1:40:00 PM
1/23/2018	7640.001	15.42	1:40:00 PM
1/23/2018	7650.001	15.42	1:40:00 PM
1/23/2018	7660.001	15.43	1:41:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	7670.001	15.43	1:41:00 PM
1/23/2018	7680.001	15.43	1:41:00 PM
1/23/2018	7690.001	15.43	1:41:00 PM
1/23/2018	7700.001	15.43	1:41:00 PM
1/23/2018	7710.001	15.42	1:41:00 PM
1/23/2018	7720.001	15.42	1:42:00 PM
1/23/2018	7730.001	15.43	1:42:00 PM
1/23/2018	7740.001	15.43	1:42:00 PM
1/23/2018	7750.001	15.43	1:42:00 PM
1/23/2018	7760.001	15.43	1:42:00 PM
1/23/2018	7770.001	15.43	1:42:00 PM
1/23/2018	7780.001	15.42	1:43:00 PM
1/23/2018	7790.001	15.42	1:43:00 PM
1/23/2018	7800.001	15.42	1:43:00 PM
1/23/2018	7810.001	15.42	1:43:00 PM
1/23/2018	7820.002	15.42	1:43:00 PM
1/23/2018	7830.001	15.42	1:43:00 PM
1/23/2018	7840.001	15.43	1:44:00 PM
1/23/2018	7850.001	15.42	1:44:00 PM
1/23/2018	7860.001	15.43	1:44:00 PM
1/23/2018	7870.001	15.43	1:44:00 PM
1/23/2018	7880.001	15.43	1:44:00 PM
1/23/2018	7890.001	15.43	1:44:00 PM
1/23/2018	7900.001	15.41	1:45:00 PM
1/23/2018	7910.001	15.41	1:45:00 PM
1/23/2018	7920.001	15.41	1:45:00 PM
1/23/2018	7930.001	15.42	1:45:00 PM
1/23/2018	7940.001	15.4	1:45:00 PM
1/23/2018	7950.001	15.41	1:45:00 PM
1/23/2018	7960.001	15.4	1:46:00 PM
1/23/2018	7970.001	15.41	1:46:00 PM
1/23/2018	7980.001	15.41	1:46:00 PM
1/23/2018	7990.001	15.41	1:46:00 PM
1/23/2018	8000.001	15.41	1:46:00 PM
1/23/2018	8010.001	15.4	1:46:00 PM
1/23/2018	8020.001	15.4	1:47:00 PM
1/23/2018	8030.001	15.4	1:47:00 PM
1/23/2018	8040.001	15.41	1:47:00 PM
1/23/2018	8050.001	15.41	1:47:00 PM
1/23/2018	8060.001	15.41	1:47:00 PM
1/23/2018	8070.001	15.4	1:47:00 PM
1/23/2018	8080.001	15.41	1:48:00 PM
1/23/2018	8090.001	15.4	1:48:00 PM
1/23/2018	8100.001	15.41	1:48:00 PM
1/23/2018	8110.001	15.4	1:48:00 PM
1/23/2018	8120.001	15.4	1:48:00 PM
1/23/2018	8130.001	15.4	1:48:00 PM
1/23/2018	8140.001	15.4	1:49:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	8150.001	15.4	1:49:00 PM
1/23/2018	8160.001	15.4	1:49:00 PM
1/23/2018	8170.001	15.41	1:49:00 PM
1/23/2018	8180.001	15.41	1:49:00 PM
1/23/2018	8190.001	15.42	1:49:00 PM
1/23/2018	8200.001	15.44	1:50:00 PM
1/23/2018	8210.001	15.44	1:50:00 PM
1/23/2018	8220.001	15.46	1:50:00 PM
1/23/2018	8230.001	15.48	1:50:00 PM
1/23/2018	8240.001	15.49	1:50:00 PM
1/23/2018	8250.001	15.5	1:50:00 PM
1/23/2018	8260.001	15.52	1:51:00 PM
1/23/2018	8270.001	15.53	1:51:00 PM
1/23/2018	8280.001	15.55	1:51:00 PM
1/23/2018	8290.001	15.57	1:51:00 PM
1/23/2018	8300.001	15.58	1:51:00 PM
1/23/2018	8310.001	15.6	1:51:00 PM
1/23/2018	8320.001	15.61	1:52:00 PM
1/23/2018	8330.001	15.63	1:52:00 PM
1/23/2018	8340.001	15.64	1:52:00 PM
1/23/2018	8350.001	15.65	1:52:00 PM
1/23/2018	8360.001	15.66	1:52:00 PM
1/23/2018	8370.001	15.69	1:52:00 PM
1/23/2018	8380.001	15.69	1:53:00 PM
1/23/2018	8390.001	15.71	1:53:00 PM
1/23/2018	8400.001	15.72	1:53:00 PM
1/23/2018	8410.001	15.74	1:53:00 PM
1/23/2018	8420.001	15.76	1:53:00 PM
1/23/2018	8430.001	15.78	1:53:00 PM
1/23/2018	8440.001	15.79	1:54:00 PM
1/23/2018	8450.001	15.8	1:54:00 PM
1/23/2018	8460.001	15.81	1:54:00 PM
1/23/2018	8470.001	15.83	1:54:00 PM
1/23/2018	8480.001	15.84	1:54:00 PM
1/23/2018	8490.001	15.86	1:54:00 PM
1/23/2018	8500.001	15.87	1:55:00 PM
1/23/2018	8510.001	15.89	1:55:00 PM
1/23/2018	8520.001	15.9	1:55:00 PM
1/23/2018	8530.001	15.91	1:55:00 PM
1/23/2018	8540.001	15.92	1:55:00 PM
1/23/2018	8550.001	15.93	1:55:00 PM
1/23/2018	8560.001	15.94	1:56:00 PM
1/23/2018	8570.001	15.96	1:56:00 PM
1/23/2018	8580.001	15.97	1:56:00 PM
1/23/2018	8590.001	15.99	1:56:00 PM
1/23/2018	8600.001	15.99	1:56:00 PM
1/23/2018	8610.001	16	1:56:00 PM
1/23/2018	8620.001	16.02	1:57:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	8630.001	16.03	1:57:00 PM
1/23/2018	8640.001	16.04	1:57:00 PM
1/23/2018	8650.001	16.06	1:57:00 PM
1/23/2018	8660.001	16.06	1:57:00 PM
1/23/2018	8670.001	16.08	1:57:00 PM
1/23/2018	8680.001	16.09	1:58:00 PM
1/23/2018	8690.001	16.11	1:58:00 PM
1/23/2018	8700.001	16.12	1:58:00 PM
1/23/2018	8710.001	16.13	1:58:00 PM
1/23/2018	8720.001	16.14	1:58:00 PM
1/23/2018	8730.001	16.15	1:58:00 PM
1/23/2018	8740.001	16.16	1:59:00 PM
1/23/2018	8750.001	16.18	1:59:00 PM
1/23/2018	8760.001	16.19	1:59:00 PM
1/23/2018	8770.001	16.2	1:59:00 PM
1/23/2018	8780.001	16.21	1:59:00 PM
1/23/2018	8790.001	16.22	1:59:00 PM
1/23/2018	8800.001	16.23	2:00:00 PM
1/23/2018	8810.001	16.25	2:00:00 PM
1/23/2018	8820.001	16.25	2:00:00 PM
1/23/2018	8830.001	16.26	2:00:00 PM
1/23/2018	8840.001	16.27	2:00:00 PM
1/23/2018	8850.001	16.28	2:00:00 PM
1/23/2018	8860.001	16.3	2:01:00 PM
1/23/2018	8870.001	16.31	2:01:00 PM
1/23/2018	8880.001	16.32	2:01:00 PM
1/23/2018	8890.001	16.33	2:01:00 PM
1/23/2018	8900.004	16.34	2:01:00 PM
1/23/2018	8910.001	16.35	2:01:00 PM
1/23/2018	8920.001	16.36	2:02:00 PM
1/23/2018	8930.001	16.38	2:02:00 PM
1/23/2018	8940.001	16.38	2:02:00 PM
1/23/2018	8950.001	16.39	2:02:00 PM
1/23/2018	8960.001	16.4	2:02:00 PM
1/23/2018	8970.001	16.41	2:02:00 PM
1/23/2018	8980.001	16.43	2:03:00 PM
1/23/2018	8990.001	16.44	2:03:00 PM
1/23/2018	9000.001	16.45	2:03:00 PM
1/23/2018	9010.001	16.46	2:03:00 PM
1/23/2018	9020.001	16.47	2:03:00 PM
1/23/2018	9030.001	16.48	2:03:00 PM
1/23/2018	9040.001	16.5	2:04:00 PM
1/23/2018	9050.001	16.51	2:04:00 PM
1/23/2018	9060.001	16.52	2:04:00 PM
1/23/2018	9070.001	16.53	2:04:00 PM
1/23/2018	9080.001	16.54	2:04:00 PM
1/23/2018	9090.001	16.55	2:04:00 PM
1/23/2018	9100.001	16.57	2:05:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	9110.001	16.57	2:05:00 PM
1/23/2018	9120.001	16.59	2:05:00 PM
1/23/2018	9130.001	16.59	2:05:00 PM
1/23/2018	9140.001	16.61	2:05:00 PM
1/23/2018	9150.001	16.61	2:05:00 PM
1/23/2018	9160.001	16.63	2:06:00 PM
1/23/2018	9170.001	16.64	2:06:00 PM
1/23/2018	9180.005	16.64	2:06:00 PM
1/23/2018	9190.001	16.65	2:06:00 PM
1/23/2018	9200.001	16.66	2:06:00 PM
1/23/2018	9210.001	16.68	2:06:00 PM
1/23/2018	9220.001	16.68	2:07:00 PM
1/23/2018	9230.001	16.7	2:07:00 PM
1/23/2018	9240.001	16.71	2:07:00 PM
1/23/2018	9250.001	16.72	2:07:00 PM
1/23/2018	9260.001	16.74	2:07:00 PM
1/23/2018	9270.001	16.74	2:07:00 PM
1/23/2018	9280.001	16.75	2:08:00 PM
1/23/2018	9290.001	16.77	2:08:00 PM
1/23/2018	9300.001	16.78	2:08:00 PM
1/23/2018	9310.001	16.79	2:08:00 PM
1/23/2018	9320.001	16.8	2:08:00 PM
1/23/2018	9330.001	16.81	2:08:00 PM
1/23/2018	9340.001	16.82	2:09:00 PM
1/23/2018	9350.001	16.83	2:09:00 PM
1/23/2018	9360.001	16.84	2:09:00 PM
1/23/2018	9370.001	16.85	2:09:00 PM
1/23/2018	9380.001	16.86	2:09:00 PM
1/23/2018	9390.001	16.87	2:09:00 PM
1/23/2018	9400.001	16.88	2:10:00 PM
1/23/2018	9410.001	16.89	2:10:00 PM
1/23/2018	9420.001	16.9	2:10:00 PM
1/23/2018	9430.001	16.91	2:10:00 PM
1/23/2018	9440.001	16.92	2:10:00 PM
1/23/2018	9450.001	16.94	2:10:00 PM
1/23/2018	9460.001	16.95	2:11:00 PM
1/23/2018	9470.001	16.96	2:11:00 PM
1/23/2018	9480.001	16.97	2:11:00 PM
1/23/2018	9490.001	16.98	2:11:00 PM
1/23/2018	9500.001	16.98	2:11:00 PM
1/23/2018	9510.001	17	2:11:00 PM
1/23/2018	9520.001	17.01	2:12:00 PM
1/23/2018	9530.001	17.02	2:12:00 PM
1/23/2018	9540.001	17.03	2:12:00 PM
1/23/2018	9550.001	17.04	2:12:00 PM
1/23/2018	9560.001	17.05	2:12:00 PM
1/23/2018	9570.001	17.06	2:12:00 PM
1/23/2018	9580.001	17.07	2:13:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	9590.001	17.09	2:13:00 PM
1/23/2018	9600.001	17.1	2:13:00 PM
1/23/2018	9610.001	17.11	2:13:00 PM
1/23/2018	9620.001	17.12	2:13:00 PM
1/23/2018	9630.001	17.13	2:13:00 PM
1/23/2018	9640.001	17.14	2:14:00 PM
1/23/2018	9650.001	17.15	2:14:00 PM
1/23/2018	9660.001	17.16	2:14:00 PM
1/23/2018	9670.001	17.17	2:14:00 PM
1/23/2018	9680.001	17.18	2:14:00 PM
1/23/2018	9690.001	17.19	2:14:00 PM
1/23/2018	9700.001	17.19	2:15:00 PM
1/23/2018	9710.001	17.2	2:15:00 PM
1/23/2018	9720.001	17.21	2:15:00 PM
1/23/2018	9730.001	17.22	2:15:00 PM
1/23/2018	9740.001	17.23	2:15:00 PM
1/23/2018	9750.001	17.24	2:15:00 PM
1/23/2018	9760.001	17.25	2:16:00 PM
1/23/2018	9770.001	17.26	2:16:00 PM
1/23/2018	9780.001	17.27	2:16:00 PM
1/23/2018	9790.001	17.27	2:16:00 PM
1/23/2018	9800.001	17.28	2:16:00 PM
1/23/2018	9810.089	17.29	2:16:00 PM
1/23/2018	9820.001	17.3	2:17:00 PM
1/23/2018	9830.001	17.31	2:17:00 PM
1/23/2018	9840.001	17.31	2:17:00 PM
1/23/2018	9850.001	17.32	2:17:00 PM
1/23/2018	9860.001	17.33	2:17:00 PM
1/23/2018	9870.001	17.34	2:17:00 PM
1/23/2018	9880.001	17.34	2:18:00 PM
1/23/2018	9890.001	17.35	2:18:00 PM
1/23/2018	9900.001	17.36	2:18:00 PM
1/23/2018	9910.001	17.37	2:18:00 PM
1/23/2018	9920.001	17.37	2:18:00 PM
1/23/2018	9930.001	17.39	2:18:00 PM
1/23/2018	9940.001	17.4	2:19:00 PM
1/23/2018	9950.001	17.4	2:19:00 PM
1/23/2018	9960.001	17.42	2:19:00 PM
1/23/2018	9970.001	17.43	2:19:00 PM
1/23/2018	9980.001	17.44	2:19:00 PM
1/23/2018	9990.001	17.45	2:19:00 PM
1/23/2018	10000.001	17.46	2:20:00 PM
1/23/2018	10010.001	17.47	2:20:00 PM
1/23/2018	10020.286	17.49	2:20:00 PM
1/23/2018	10030.001	17.5	2:20:00 PM
1/23/2018	10040.001	17.51	2:20:00 PM
1/23/2018	10050.001	17.52	2:20:00 PM
1/23/2018	10060.001	17.53	2:21:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	10070.001	17.54	2:21:00 PM
1/23/2018	10080.001	17.55	2:21:00 PM
1/23/2018	10090.001	17.56	2:21:00 PM
1/23/2018	10100.001	17.57	2:21:00 PM
1/23/2018	10110.001	17.59	2:21:00 PM
1/23/2018	10120.001	17.59	2:22:00 PM
1/23/2018	10130.001	17.6	2:22:00 PM
1/23/2018	10140.001	17.62	2:22:00 PM
1/23/2018	10150.001	17.63	2:22:00 PM
1/23/2018	10160.204	17.63	2:22:00 PM
1/23/2018	10170.001	17.65	2:22:00 PM
1/23/2018	10180.001	17.66	2:23:00 PM
1/23/2018	10190.001	17.67	2:23:00 PM
1/23/2018	10200.001	17.67	2:23:00 PM
1/23/2018	10210.001	17.69	2:23:00 PM
1/23/2018	10220.001	17.7	2:23:00 PM
1/23/2018	10230.001	17.71	2:23:00 PM
1/23/2018	10240.001	17.73	2:24:00 PM
1/23/2018	10250.001	17.73	2:24:00 PM
1/23/2018	10260.005	17.75	2:24:00 PM
1/23/2018	10270.001	17.76	2:24:00 PM
1/23/2018	10280.001	17.77	2:24:00 PM
1/23/2018	10290.001	17.78	2:24:00 PM
1/23/2018	10300.001	17.78	2:25:00 PM
1/23/2018	10310.001	17.8	2:25:00 PM
1/23/2018	10320.001	17.81	2:25:00 PM
1/23/2018	10330.001	17.82	2:25:00 PM
1/23/2018	10340.001	17.83	2:25:00 PM
1/23/2018	10350.001	17.84	2:25:00 PM
1/23/2018	10360.001	17.85	2:26:00 PM
1/23/2018	10370.001	17.86	2:26:00 PM
1/23/2018	10380.001	17.87	2:26:00 PM
1/23/2018	10390.001	17.88	2:26:00 PM
1/23/2018	10400.001	17.9	2:26:00 PM
1/23/2018	10410.001	17.91	2:26:00 PM
1/23/2018	10420.001	17.92	2:27:00 PM
1/23/2018	10430.001	17.93	2:27:00 PM
1/23/2018	10440.041	17.94	2:27:00 PM
1/23/2018	10450.007	17.95	2:27:00 PM
1/23/2018	10460.001	17.96	2:27:00 PM
1/23/2018	10470.001	17.97	2:27:00 PM
1/23/2018	10480.001	17.98	2:28:00 PM
1/23/2018	10490.001	17.99	2:28:00 PM
1/23/2018	10500.001	17.99	2:28:00 PM
1/23/2018	10510.001	18	2:28:00 PM
1/23/2018	10520.001	18.01	2:28:00 PM
1/23/2018	10530.001	18.02	2:28:00 PM
1/23/2018	10540.005	18.03	2:29:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	10550.001	18.04	2:29:00 PM
1/23/2018	10560.001	18.05	2:29:00 PM
1/23/2018	10570.001	18.06	2:29:00 PM
1/23/2018	10580.001	18.07	2:29:00 PM
1/23/2018	10590.001	18.08	2:29:00 PM
1/23/2018	10600.001	18.09	2:30:00 PM
1/23/2018	10610.001	18.1	2:30:00 PM
1/23/2018	10620.001	18.11	2:30:00 PM
1/23/2018	10630.001	18.11	2:30:00 PM
1/23/2018	10640.001	18.13	2:30:00 PM
1/23/2018	10650.001	18.14	2:30:00 PM
1/23/2018	10660.001	18.14	2:31:00 PM
1/23/2018	10670.001	18.16	2:31:00 PM
1/23/2018	10680.002	18.17	2:31:00 PM
1/23/2018	10690.001	18.19	2:31:00 PM
1/23/2018	10700.001	18.2	2:31:00 PM
1/23/2018	10710.001	18.22	2:31:00 PM
1/23/2018	10720.001	18.22	2:32:00 PM
1/23/2018	10730.001	18.23	2:32:00 PM
1/23/2018	10740.001	18.25	2:32:00 PM
1/23/2018	10750.001	18.25	2:32:00 PM
1/23/2018	10760.001	18.26	2:32:00 PM
1/23/2018	10770.001	18.27	2:32:00 PM
1/23/2018	10780.001	18.28	2:33:00 PM
1/23/2018	10790.001	18.29	2:33:00 PM
1/23/2018	10800.001	18.3	2:33:00 PM
1/23/2018	10810.001	18.31	2:33:00 PM
1/23/2018	10820.001	18.31	2:33:00 PM
1/23/2018	10830.001	18.32	2:33:00 PM
1/23/2018	10840.001	18.33	2:34:00 PM
1/23/2018	10850.001	18.33	2:34:00 PM
1/23/2018	10860.001	18.34	2:34:00 PM
1/23/2018	10870.001	18.35	2:34:00 PM
1/23/2018	10880.001	18.36	2:34:00 PM
1/23/2018	10890.001	18.37	2:34:00 PM
1/23/2018	10900.001	18.37	2:35:00 PM
1/23/2018	10910.001	18.37	2:35:00 PM
1/23/2018	10920.001	18.38	2:35:00 PM
1/23/2018	10930.001	18.39	2:35:00 PM
1/23/2018	10940.001	18.4	2:35:00 PM
1/23/2018	10950.001	18.4	2:35:00 PM
1/23/2018	10960.001	18.4	2:36:00 PM
1/23/2018	10970.001	18.42	2:36:00 PM
1/23/2018	10980.001	18.42	2:36:00 PM
1/23/2018	10990.001	18.43	2:36:00 PM
1/23/2018	11000.001	18.44	2:36:00 PM
1/23/2018	11010.001	18.44	2:36:00 PM
1/23/2018	11020.001	18.46	2:37:00 PM

17WW02 Step Test - Adjusted time-date-depth only.txt

1/23/2018	11030.001	18.46	2:37:00 PM
1/23/2018	11040.001	18.47	2:37:00 PM
1/23/2018	11050.001	18.47	2:37:00 PM
1/23/2018	11060.001	18.48	2:37:00 PM
1/23/2018	11070.001	18.49	2:37:00 PM
1/23/2018	11080.001	18.5	2:38:00 PM
1/23/2018	11090.001	18.5	2:38:00 PM
1/23/2018	11100.001	18.52	2:38:00 PM
1/23/2018	11110.001	18.53	2:38:00 PM
1/23/2018	11120.001	18.52	2:38:00 PM
1/23/2018	11130.001	18.53	2:38:00 PM