Longhorn Army Ammunition Plant Quarterly Restoration Advisory Board Meeting

Karnack Community Center
January 16, 2020
6:00 PM CST

APTIM

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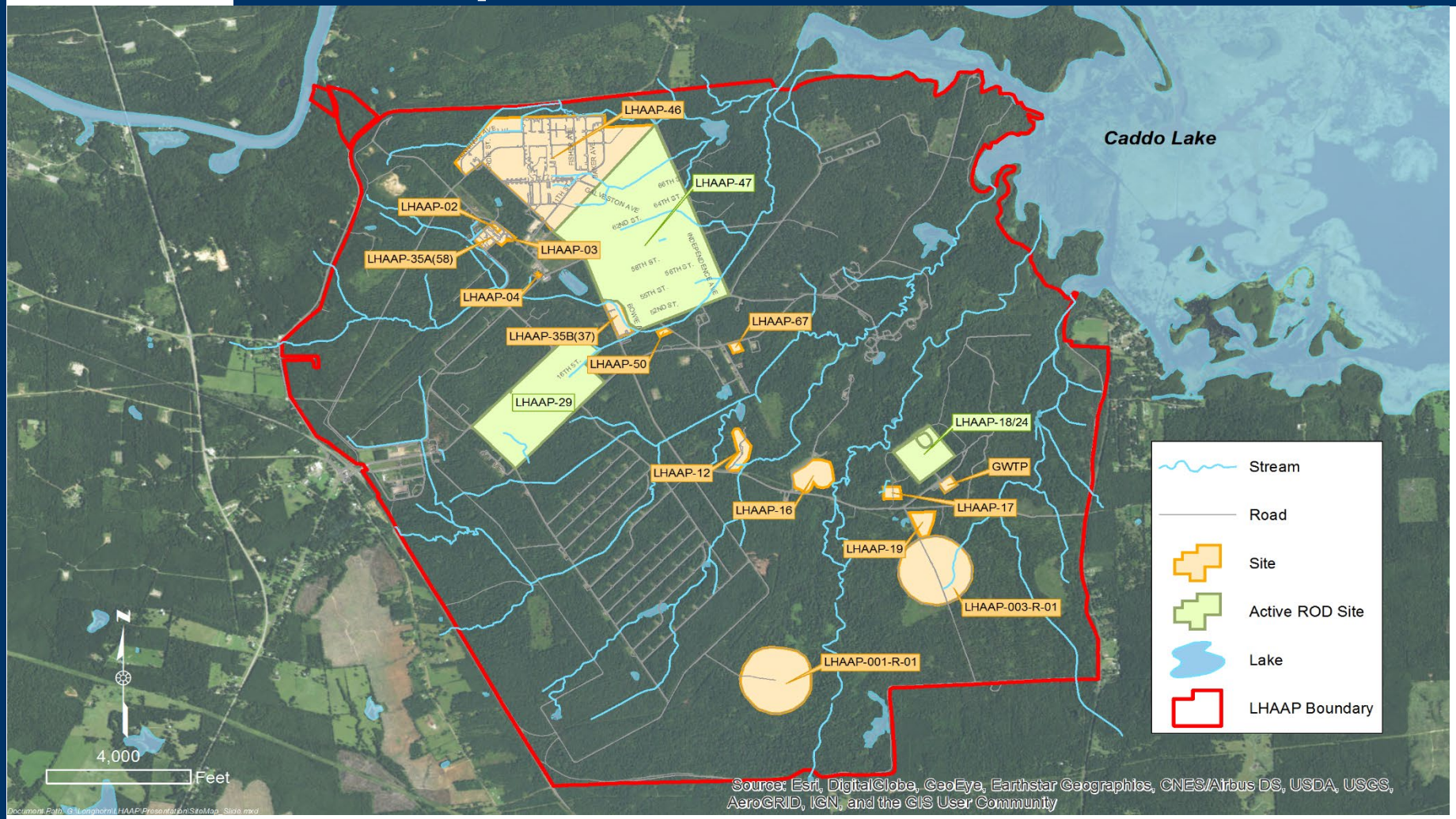
Restoration Advisory Board Meeting

Site Map



Abbreviations and Acronyms

µg/L	Micrograms per liter
COC	Chemical of Concern
DERP	Defense Environmental Restoration Program
DPT	Direct Push Technology
GPW	Goose Prairie Creek Water Sample
GW-Ind	Industrial Groundwater
GWTP	Groundwater Treatment Plant
HBW	Harrison Bayou Water Sample
ISB	In-situ bioremediation
LHAAP	Longhorn Army Ammunition Plant
MSC	Medium-Specific Concentration
PCL	Protective Concentration Level
PSI	Pre-Screening Investigation
RAB	Restoration Advisory Board
RA(O)	Remedial Action Operation
RAWP	Remedial Action Work Plan
ROD	Record of Decision
RRR	Risk Reduction Rule
TCE	Trichloroethylene
TRRP	Texas Risk Reduction Program

Restoration Advisory Board Meeting

Agenda

06:00 Welcome and Introduction

06:05 Open Items {RMZ}

- Purpose of the Restoration Advisory Board (RAB) Meeting
- Ongoing Outreach/Website
- RAB Administrative Issues
  - Membership Update
  - Minutes (October 2019 RAB Meeting)

06:15 Defense Environmental Restoration Program (DERP) Update {Bhate}

- Documents and Field Work Completed since last RAB
  - Remedial Action at LHAAP-04
  - Remedial Action at LHAAP-16
  - Remedial Action Operation [RA(O)] Sampling at LHAAP- 67
- Three Month Look ahead
- Groundwater Treatment Plant (GWTP) Update

06:45 Other DERP Update {RMZ}

- LHAAP-18/24, -29, and -47 Document Status
- LHAAP-47 Additional Pre-Screening Investigation (PSI) Data and Revised Schedule for the Record of Decision (ROD)
- Five Year Review Update – LHAAP-12, -50, and -67

06:55 Next RAB Meeting Schedule and Closing Remarks {RMZ}

Purpose of the RAB Meeting

- Held every 3 months
- The mission of the Longhorn Army Ammunition Plant (LHAAP) RAB is to promote community awareness and obtain constructive community review and comments on environmental restoration activities at the former LHAAP

The Army Wants You to be Informed

- The Army is committed to protecting human health and the environment; key to that commitment is engaging the community and increasing public participation in environmental restoration at LHAAP
- You are encouraged to:
  - Attend RAB Meetings and/or become a member of the RAB
  - Visit the Longhorn environmental website at www.longhornaap.com. The website is regularly updated to indicate the upcoming field events at each site including groundwater sampling, monitoring well installations, soil sampling, or remediation activities.
  - Make suggestions for improving communication – the Army welcomes and appreciates community feedback

RAB Administrative Issues

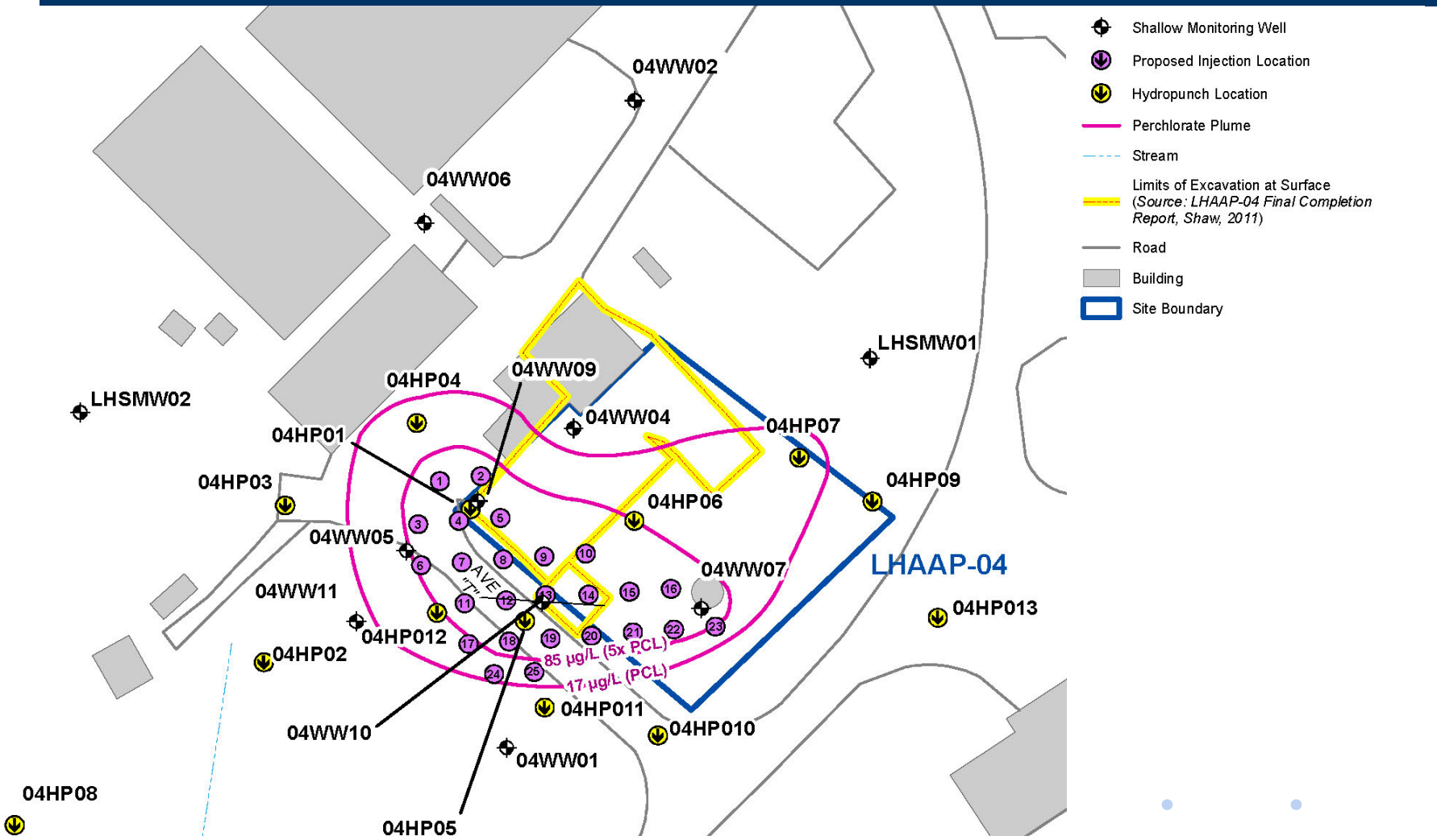
- Membership Update
- Minutes (October 2019 RAB Meeting)

Completed Field Work Since Last RAB Meeting

Site	Activity
LHAAP-03	Remedial Action (Soil Excavation)
LHAAP-04	Remedial Action (In-situ bioremediation [ISB] Injections)
LHAAP-16	Remedial Action (ISB Injections)
LHAAP-58	RA(O) Sampling –December 2019
LHAAP-18/24	RA(O) Sampling – December 2019

Restoration Advisory Board Meeting

LHAAP-04 Remedial Action Update



LHAAP-04 Remedial Action Update

- ISB Injections performed in October and November 2019
- Injected 37,100 gallons of emulsified vegetable oil, nutrient, and water solution into 25 direct push injection locations
- Injection intervals ranged between 6 and 20 feet below ground surface
- Due to topography of site ditches and shallow injection depths “daylighting” of injected solution did occur requiring very slow injection rates
- Injected solution reached several of the most contaminated wells during injection, confirming radius of influence
- Performance total organic carbon sampling confirmed carbon source reached wells within the injection area

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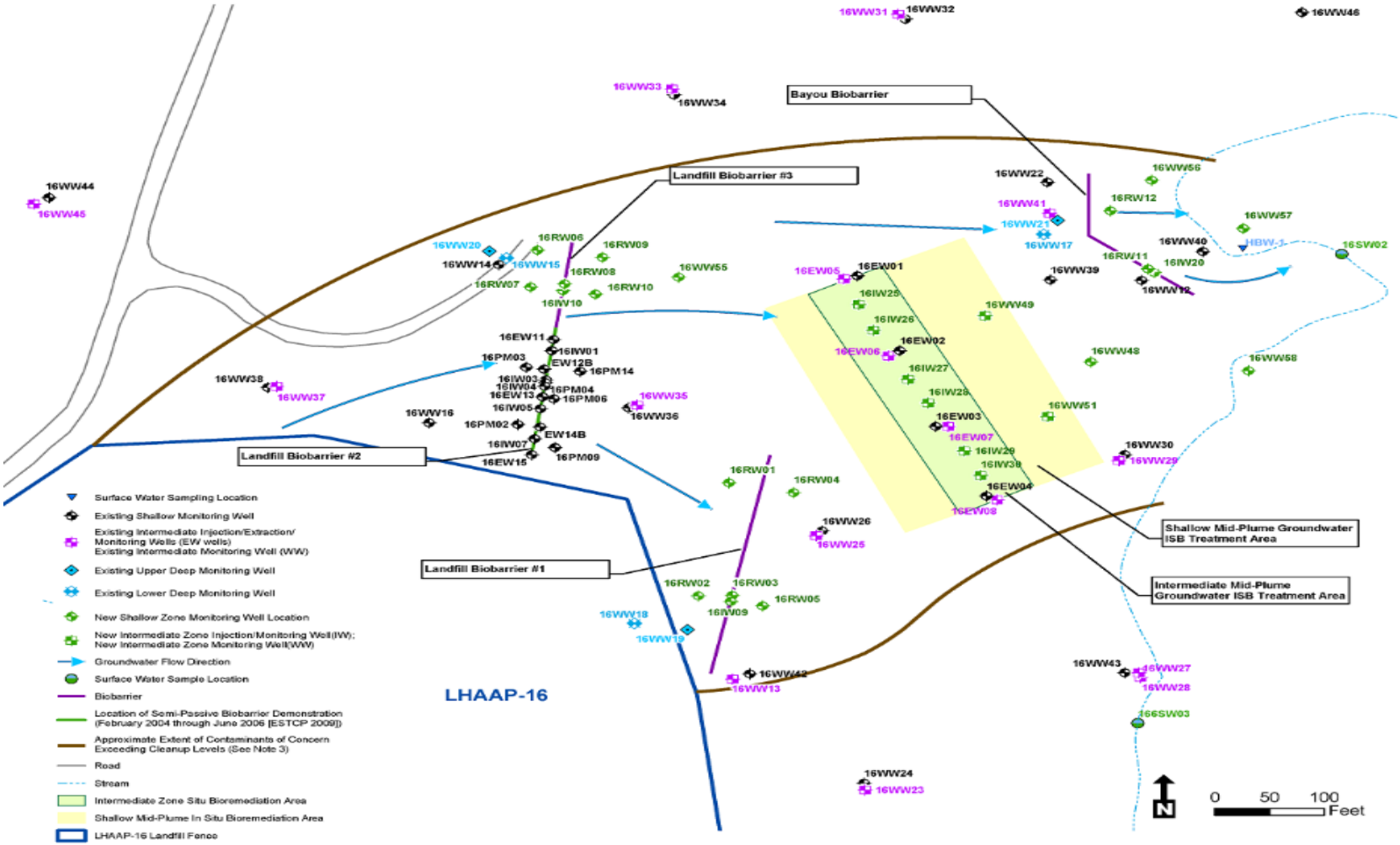
LHAAP-16 Remedial Action Update



LHAAP-16 Remedial Action Update

- ISB Injections performed from September – December 2019
- Injected ISB solution into direct push injection locations, newly installed injection wells, and existing wells in the Bayou Biobarrier; Landfill Biobarriers 1, 2, & 3; and the mid-plume area
- Injected 84,678 gallons of emulsified vegetable oil, nutrients, and bio-augmentation culture in 78 direct push injection locations and 22 injection wells
- Recirculated extracted groundwater in mid-plume intermediate zone and Landfill Biobarrier 2 to enhance distribution of amendments
- Minimal “daylighting” of injected solution occurred and observations and monitoring confirmed no impact to the Bayou

LHAAP-16 Remedial Action Update

- First round of performance sampling has been completed for the Bayou Biobarrier, Landfill Biobarriers 1 and 3, and the mid-plume intermediate and shallow injection areas
- First round of performance sampling for Landfill Biobarrier 2 will be completed in January 2020.

LHAAP-67 RA(O) Sampling

- Monitoring performed at 17 wells (15 sampled and 2 gauged for elevation only) in October 2018 and May 2019
- Results reported in the Year 5 RA(O) Report currently in preparation for submittal to the regulators
- Year 5 RA(O) Report recommends proceeding with annual monitoring beginning in October 2019 in accordance with the Response Action Completion Report
- October 2019 sampling event included the 2 newly installed wells (67WW17 and 67WW18) as a result of the Five Year Review Recommendation
- Chemicals of Concern (COCs) were not detected in either of the newly installed wells

Documents in Process

Site	Document
LHAAP-04	Response Action Completion Report
LHAAP-37	Annual RA(O) Report
LHAAP-46	Annual RA(O) Report
LHAAP-67	Annual RA(O) Report
GWTP	Quarterly Evaluation Report: Third Quarter (July – September 2019)

Restoration Advisory Board Meeting

3 Month Look Ahead - Field Work by Bhate Team

Site	Activity
LHAAP-03	Complete excavation backfill
LHAAP-04	Performance monitoring
LHAAP-16	Performance monitoring
LHAAP-17	Complete excavation backfill
LHAAP-46	RA(O) Sampling – February 2020
LHAAP-50	Contingency Remedial Action Implementation
LHAAP-58	RA(O) Sampling – March 2020

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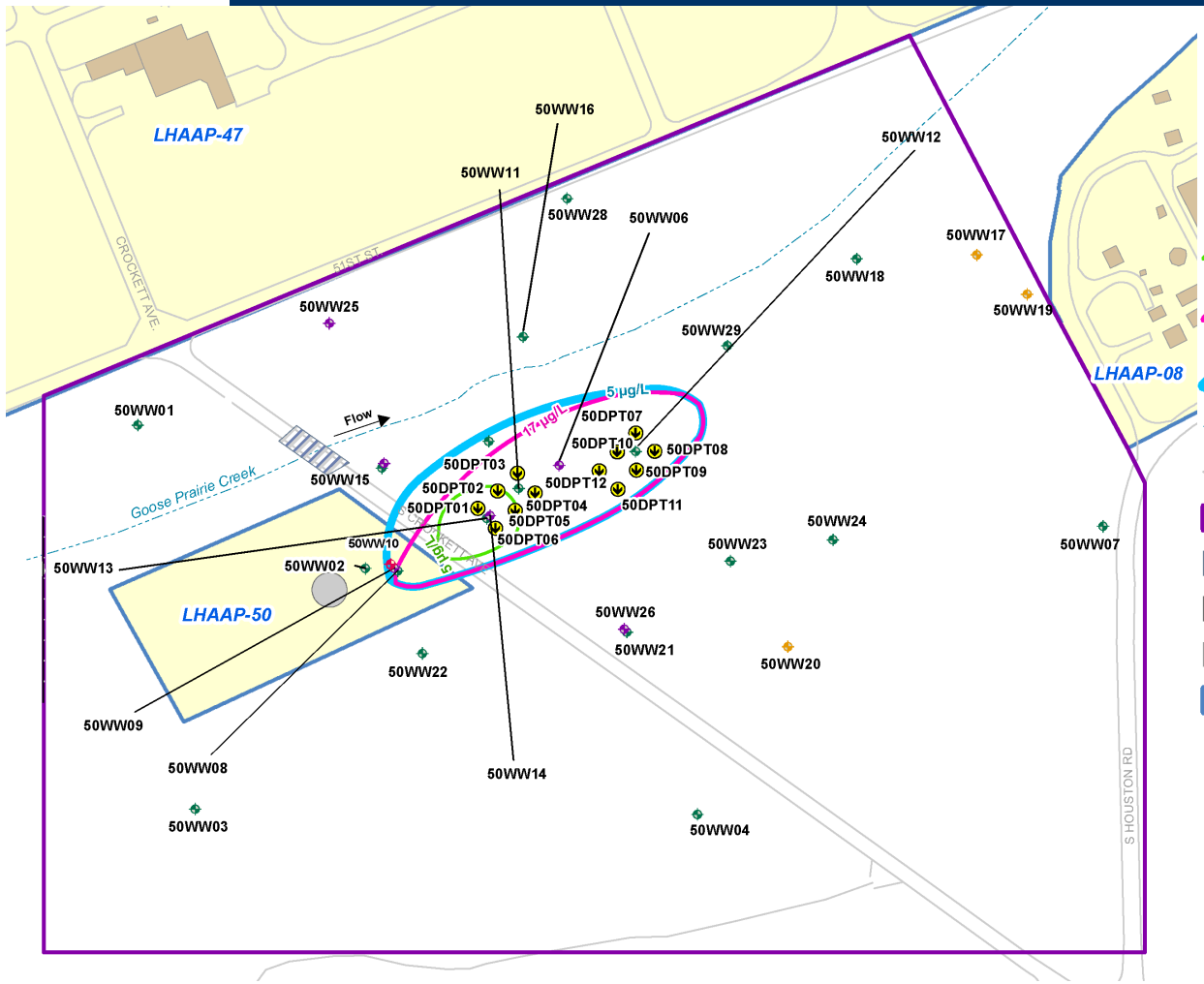
LHAAP-50 Contingency Remedial Action



3 Month Look Ahead – Documents by Bhate Team

Site	Document
LHAAP-04	Response Action Completion Report to Regulators
LHAAP-37	RA(O) Report to Regulators
LHAAP-46	RA(O) Report to Regulators
LHAAP-67	Finalize RA(O) Report
GWTP, LHAAP-16, and LHAAP-18/24	Quarterly Evaluation Report: Third Quarter (July –September 2019) Quarterly Evaluation Report: Fourth Quarter (October – December 2019)

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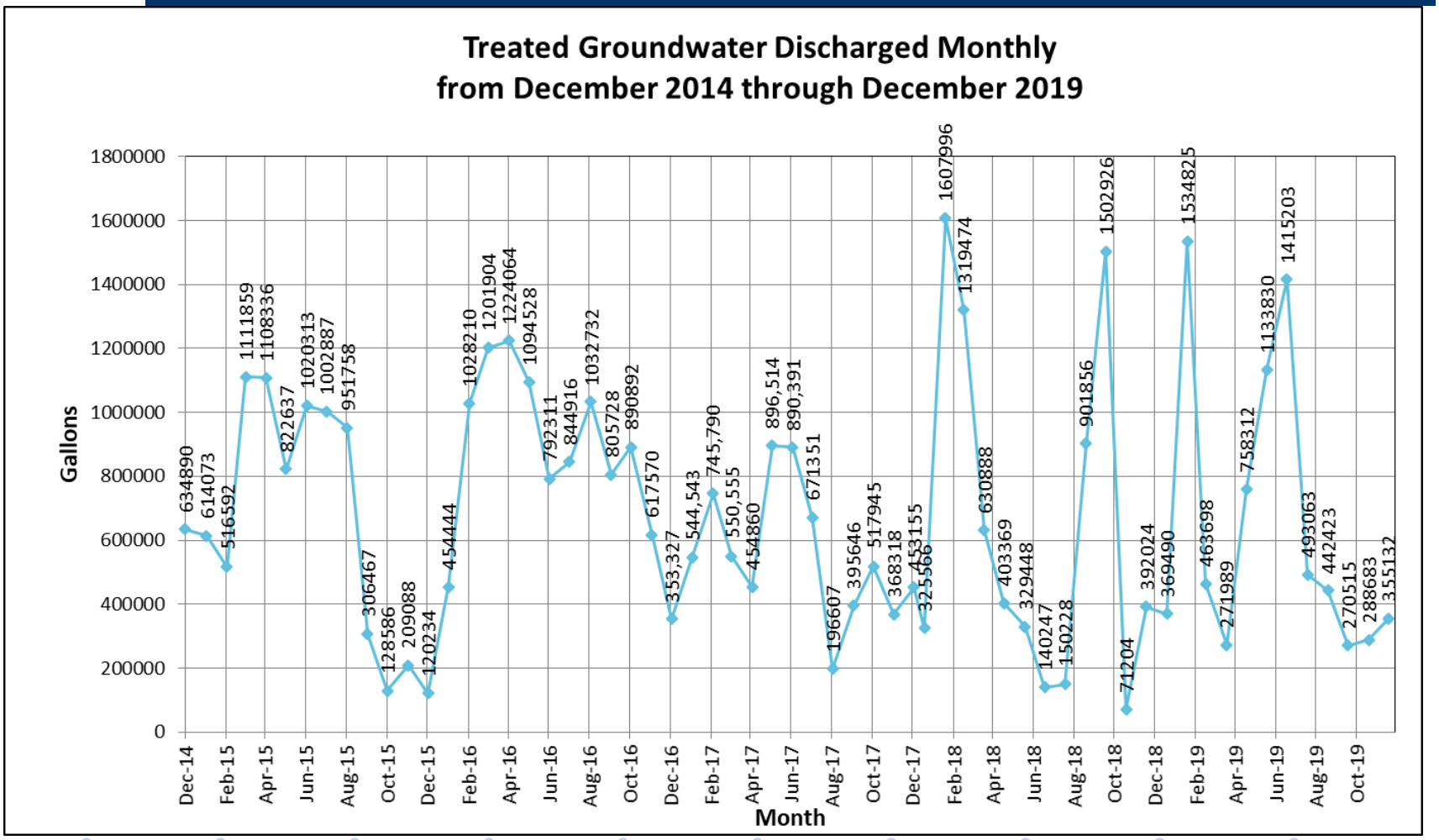
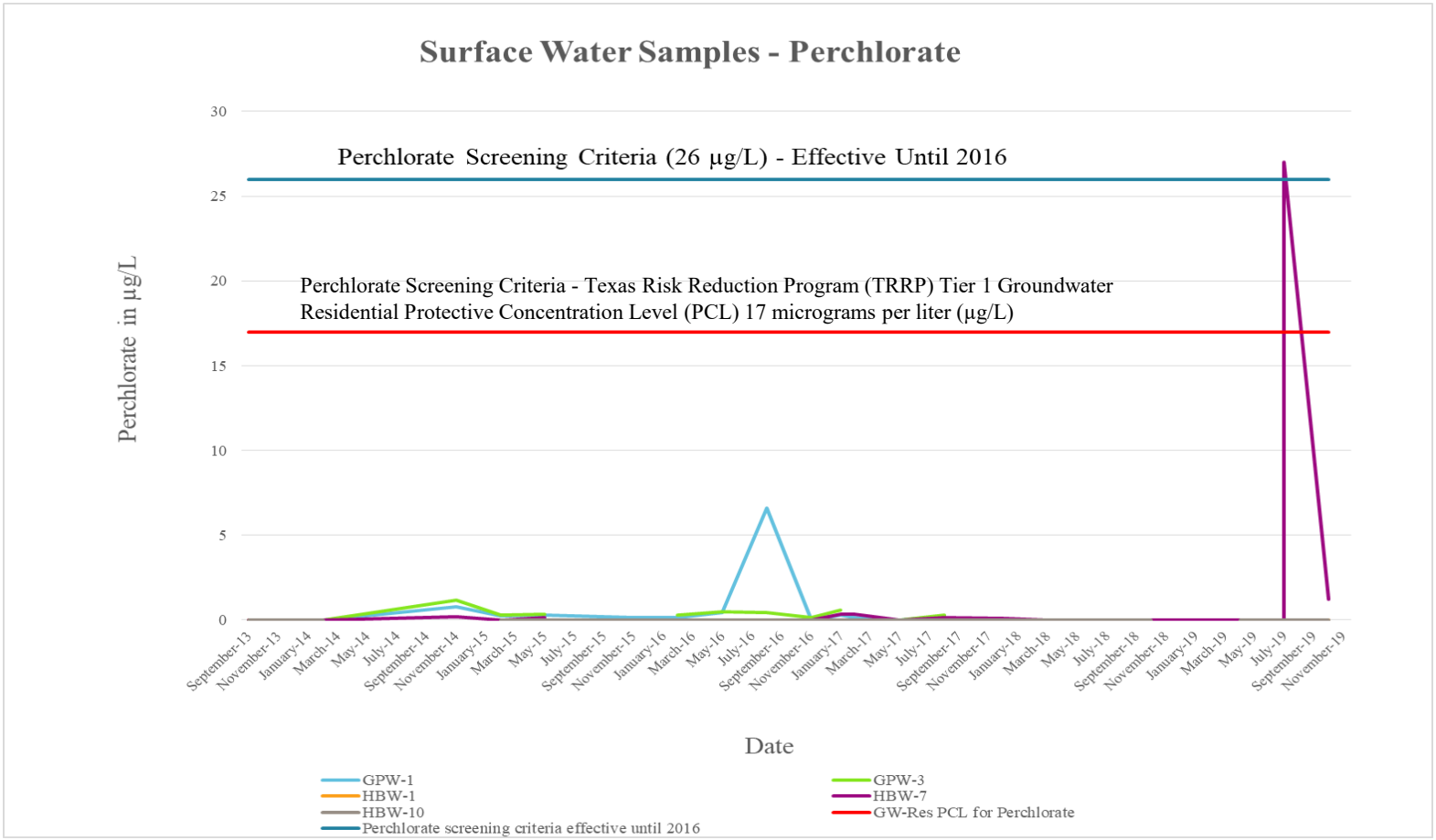
GWTP Update



Restoration Advisory Board Meeting

Surface Water Sample Results



Note: Surface water at HBW-7 had a detection of 27 µg/L from a sample collected on 11 July 2019. Surface water at HBW-7 was resampled 19 days later (30 July 2019) with a detection of 1.2 J µg/L.

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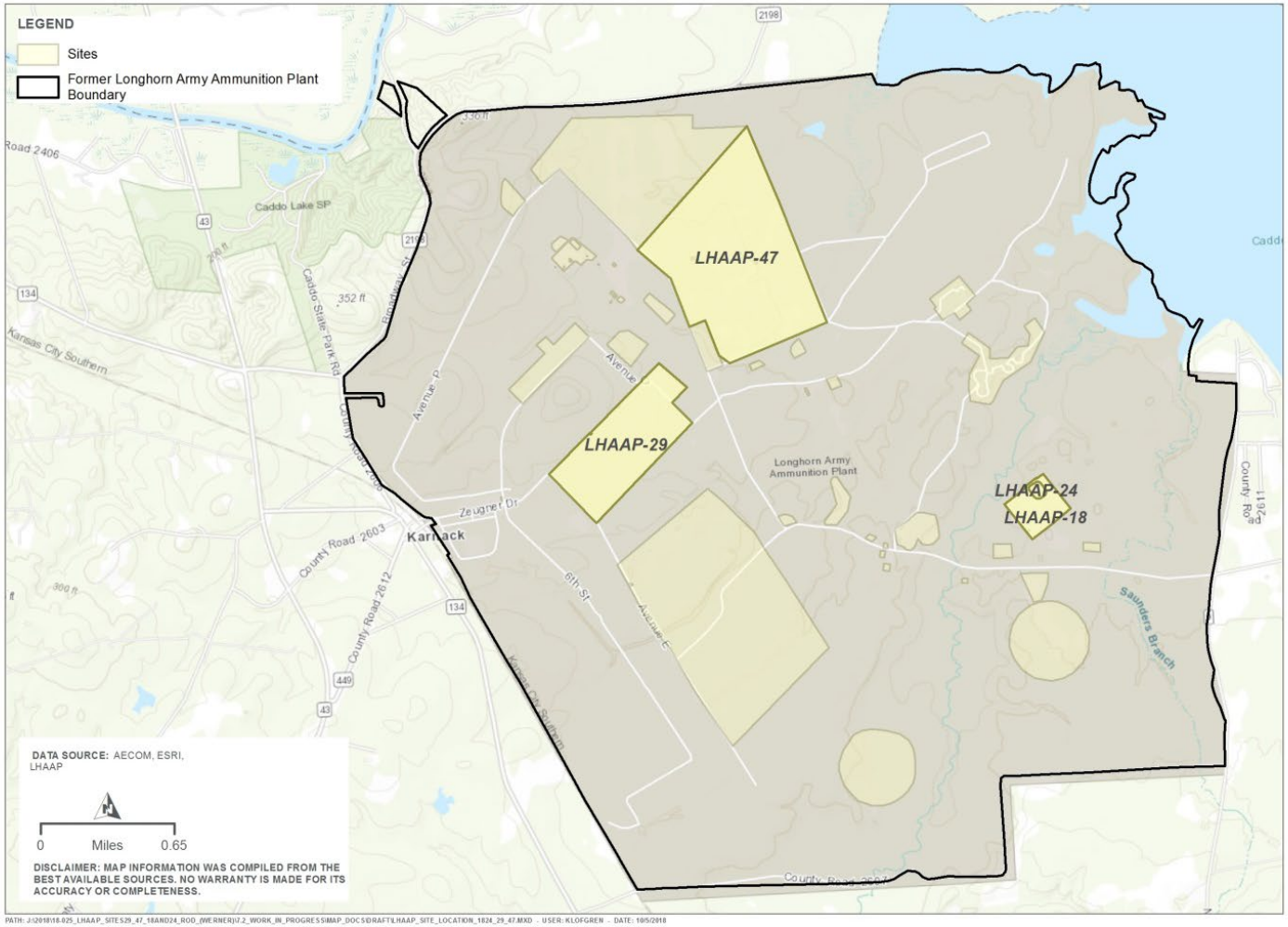
LHAAP-18/24, 29, 47 Status Update

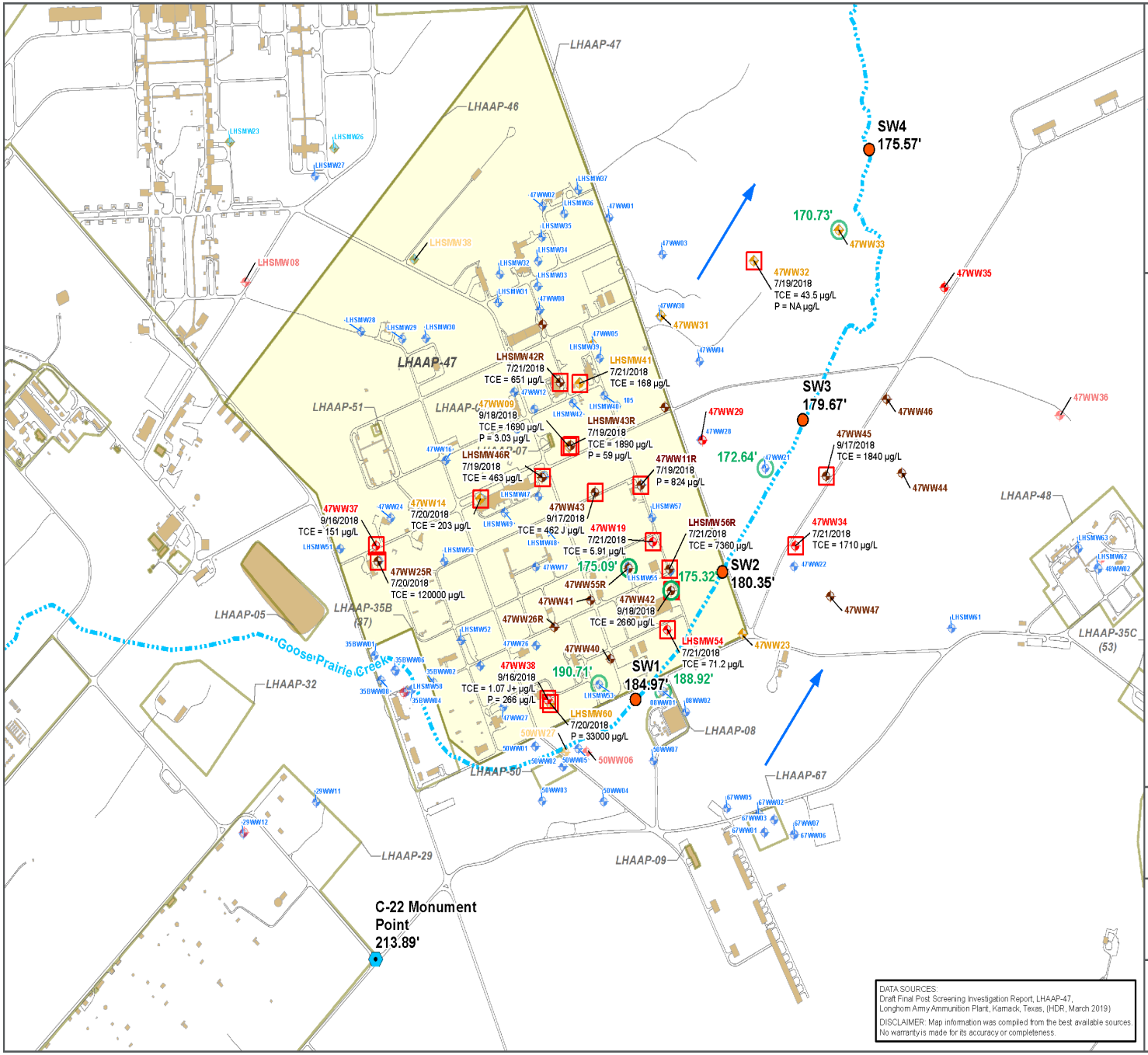


LHAAP-18/24,29 and 47 Document Status

- LHAAP-18/24
  - Final ROD signed by Army and submitted to the Regulators January 9, 2020, for signature and concurrence.
- LHAAP-29
  - Final ROD signed September 19, 2019
  - The ROD is available for public review at the Marshall Public Library.
- LHAAP-47
  - Draft PSI Report Addendum No. 2 in Regulator review
  - Results confirm a trichloroethylene (TCE) source area exists that requires further defining for remedial action analysis/costing.

LHAAP-47 Field Work Completed

- **Work Completed**
  - 11 Direct Push Technology (DPT) borings
  - 33 soil samples and 11 groundwater samples from DPT borings to identify source and extent
  - Groundwater samples from 3 existing wells for confirmation of results



LEGEND

LHAAP47 Surface Water Samples

- C-22 Monument Point
- Surface Water Samples (184.97' = elevation above mean sea level)
- Nearby Ground Water Elevations (170.93' = elevation above mean see level)
- Monitoring Well With Contaminant That Exceeds Cleanup Criteria
- Sampled Shallow/Intermediate Monitoring Well
- Shallow/Intermediate Monitoring Well (Not Sampled)
- Intermediate Monitoring Well (Not Sampled)
- Sampled Intermediate Monitoring Well
- Sampled Intermediate (Upper) Monitoring Well
- 2010 Shallow Monitoring Well
- 2010 Shallow/Intermediate Monitoring Well
- Goose Prairie Creek
- Roads
- Building
- LHAAP-47
- Site LHAAP
- Groundwater Flow Direction

The coordinates for sample location SW2 were revisited April 25, 2019 due to irregular readings originally recorded.

DATA SOURCES:
Draft Final Post Screening Investigation Report, LHAAP-47, Longhorn Army Ammunition Plant, Karnack, Texas, (HDR, March 2019)

DISCLAIMER: Map information was compiled from the best available sources. No warranty is made for its accuracy or completeness.

SURFACE WATER SAMPLE LOCATIONS AND NEARBY MONITORING WELLS
LHAAP 47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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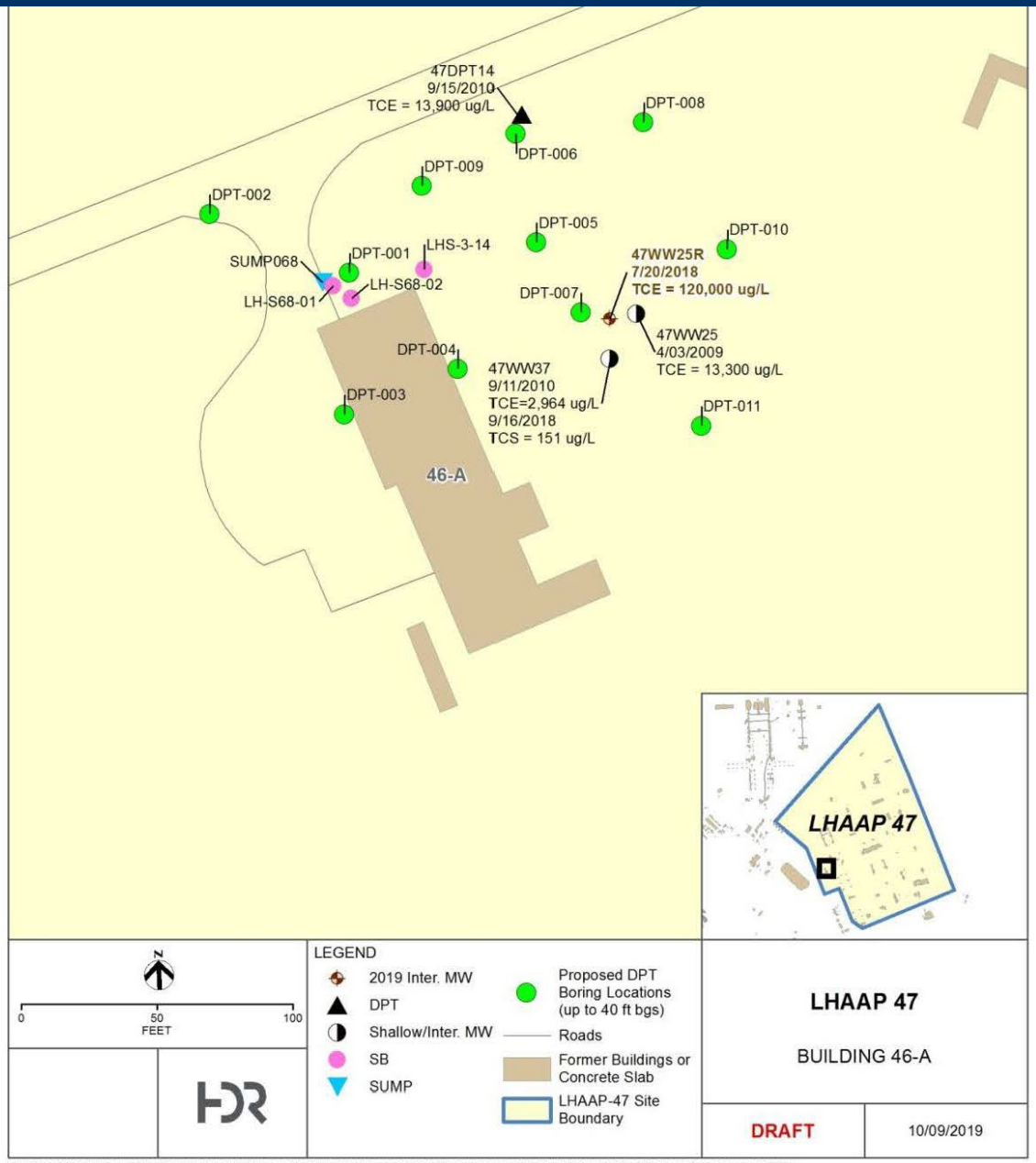
FIGURE 2-1

PATH: J:\2018\10-025_LHAAP_SITES29_47_18AND24_ROD_(WERNER)\7.2_WORK_IN_PROGRESS\MAP_DOCS\DRAFT\LHAAP47\LHAAP47_PSI_TCE_PERCH_MW_2018RESULTS_ELEVATIONS.MXD - USER: KLOFGREN - DATE: 6/20/2019

LHAAP-47 Field Work Completed



LHAAP-47 Field Work Results - Soil

Chemical Name	Sample ID	DPT-001		
	Collection Date	11/5/2019		
	Depth Interval (ft bgs)	27-28	31-32	38-39
1,1-Dichloroethene	mg/kg	0.00493	ND	ND
cis-1,2-Dichloroethene		0.0738	ND	ND
Acetone		ND	0.0195 J	ND
Trichloroethene		**11.8**	0.00162 J	ND
Vinyl Chloride		0.000985 J	ND	ND

Chemical Name	Sample ID	DPT-002		
	Collection Date	11/4/2019		
	Depth Interval (ft bgs)	26-27	32-33	40-41
cis-1,2-Dichloroethene	mg/kg	0.000561 J	0.00164 J	ND
Trichloroethene		0.0165	0.0039	ND

Chemical Name	Sample ID	DPT-003		
	Collection Date	11/4/2019		
	Depth Interval (ft bgs)	29-30	35-36	39-40
1,1-Dichloroethene	mg/kg	0.00894	ND	ND
cis-1,2-Dichloroethene		0.0315	ND	ND
Carbon disulfide		ND	ND	0.000953 J
Acetone		0.0128 J	ND	0.0115 J
Tetrachloroethene		0.00105 J	ND	ND
Trichloroethene		**15.8**	ND	0.00148 J
Vinyl Chloride		0.000581 J	ND	ND

Chemical Name	Sample ID	DPT-004		
	Collection Date	11/6/2019		
	Depth Interval (ft bgs)	28-29	30-31	32-33
1,1-Dichloroethene	mg/kg	0.00264	ND	ND
cis-1,2-Dichloroethene		0.0322	0.00211 J	ND
Acetone		ND	ND	0.00894 J
Trichloroethene		**8.37**	0.0187	0.000894 J
Vinyl Chloride		0.000633 J	ND	ND

Chemical Name	Sample ID	DPT-005		
	Collection Date	11/5/2019		
	Depth Interval (ft bgs)	24-25	27-28	31-32
1,1-Dichloroethene	mg/kg	0.000799 J	0.000622 J	ND
cis-1,2-Dichloroethene		0.0342	0.0487	0.00426
Trichloroethene		**1.62**	**0.957**	0.271

Chemical Name	Sample ID	DPT-006		
	Collection Date	11/5/2019		
	Depth Interval (ft bgs)	20-21	27-28	30-31
cis-1,2-Dichloroethene	mg/kg	0.00199 J	0.0056	ND
Trichloroethene		0.0684	0.191	0.00124 J

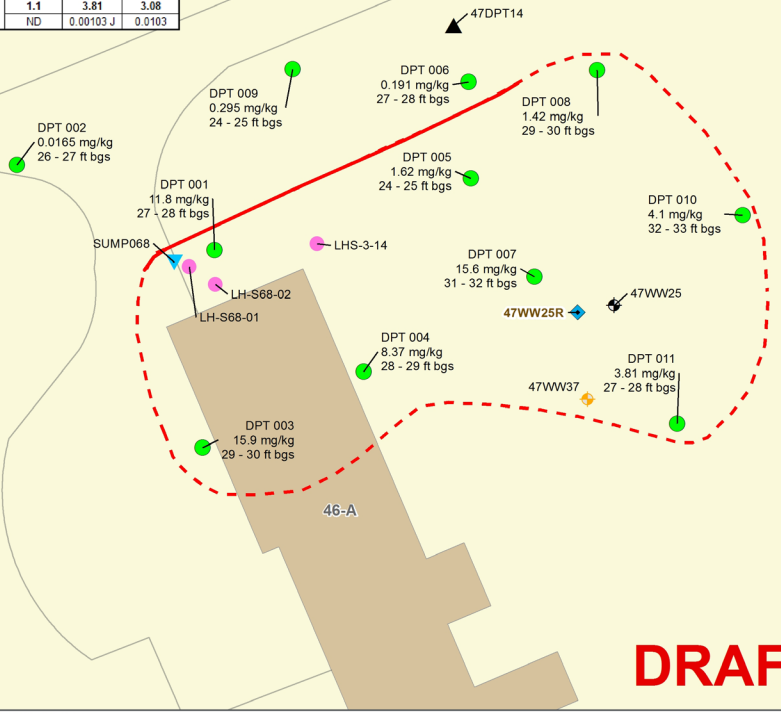
Chemical Name	Sample ID	DPT-007		
	Collection Date	11/5/2019		
	Depth Interval (ft bgs)	27-28	29-30	31-32
1,1-Dichloroethene	mg/kg	0.00297	0.000647 J	0.00046 J
cis-1,2-Dichloroethene		0.084 J	0.0541	0.0513
Benzene		ND	ND	0.000575 J
Toluene		0.000955 J	0.000755 J	0.00046 J
Trichloroethene		6.21	**1.76**	**15.6**
Vinyl Chloride		0.00456	0.00129 J	0.00103 J

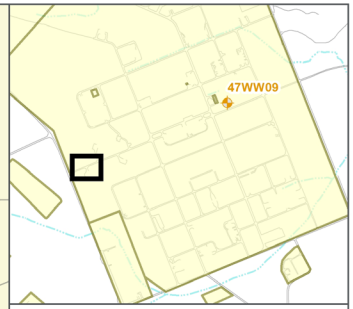
Chemical Name	Sample ID	DPT-008		
	Collection Date	11/6/2019		
	Depth Interval (ft bgs)	26-27	27-28	29-30
1,1-Dichloroethane	mg/kg	0.000722 J	0.000437 J	0.000802 J
1,1-Dichloroethene		0.00103 J	0.000524 J	0.0015 J
cis-1,2-Dichloroethene		0.082	0.0404	0.0746 J
Methylene Chloride		ND	0.00166 J	ND
Toluene		ND	ND	0.000501 J
Trichloroethene		**1.34**	0.497	**1.42**
Vinyl Chloride		0.000825 J	ND	0.0016 J

Chemical Name	Sample ID	DPT-009		
	Collection Date	11/5/2019		
	Depth Interval (ft bgs)	24-25	28-29	31-32
1,1-Dichloroethene	mg/kg	0.000613 J	ND	ND
1,2,3-Trichloropropane		ND	ND	0.00118
cis-1,2-Dichloroethene		0.0445	ND	ND
Acetone		0.0153 J	ND	ND
Trichloroethene		0.295	0.00105 J	ND

Chemical Name	Sample ID	DPT-10		
	Collection Date	11/6/2019		
	Depth Interval (ft bgs)	23-24	28-29	32-33
1,1-Dichloroethene	mg/kg	ND	**1.99**	**2.93**
trans-1,2-Dichloroethene		ND	0.000474 J	0.000756 J
cis-1,2-Dichloroethene		0.028	0.205	0.285
Toluene		ND	0.00123 J	ND
Trichloroethene		**1.24**	**3.18**	**4.1**
Vinyl Chloride		ND	ND	0.0298 J

Chemical Name	Sample ID	DPT-11		
	Collection Date	11/6/2019		
	Depth Interval (ft bgs)	22-23	27-28	31-32
1,1-Dichloroethene	mg/kg	ND	0.000601 J	0.00188
2-Butanone		ND	ND	0.0199 J
cis-1,2-Dichloroethene		0.0501	0.105	0.229
trans-1,2-Dichloroethene		ND	0.00043 J	0.000736 J
Benzene		ND	ND	0.000572 J
Chloroform		ND	0.00043 J	ND
Trichloroethene		**1.1**	**3.81**	**3.08**
Vinyl Chloride		ND	0.00103 J	0.0103





LEGEND

- DPT Boring Locations (up to 40 ft bgs)
- 2019 Upper Inter. MW
- Inter. MW
- Shallow MW
- DPT
- SB (Soil Boring Shaw, 2010)
- SUMP

Contaminant Level

- TCE > 0.5 mg/kg GWP-Ind-MSC
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTES: Bold = Concentration exceeds GWP-Ind
All units are in milligrams per kilogram (mg/kg)
J = Estimated Value

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SOIL SAMPLE RESULTS

TECHNICAL MEMORANDUM: LHAAP-47
INTERIM POST-SCREENING INVESTIGATION
ADDENDUM 2 REPORT

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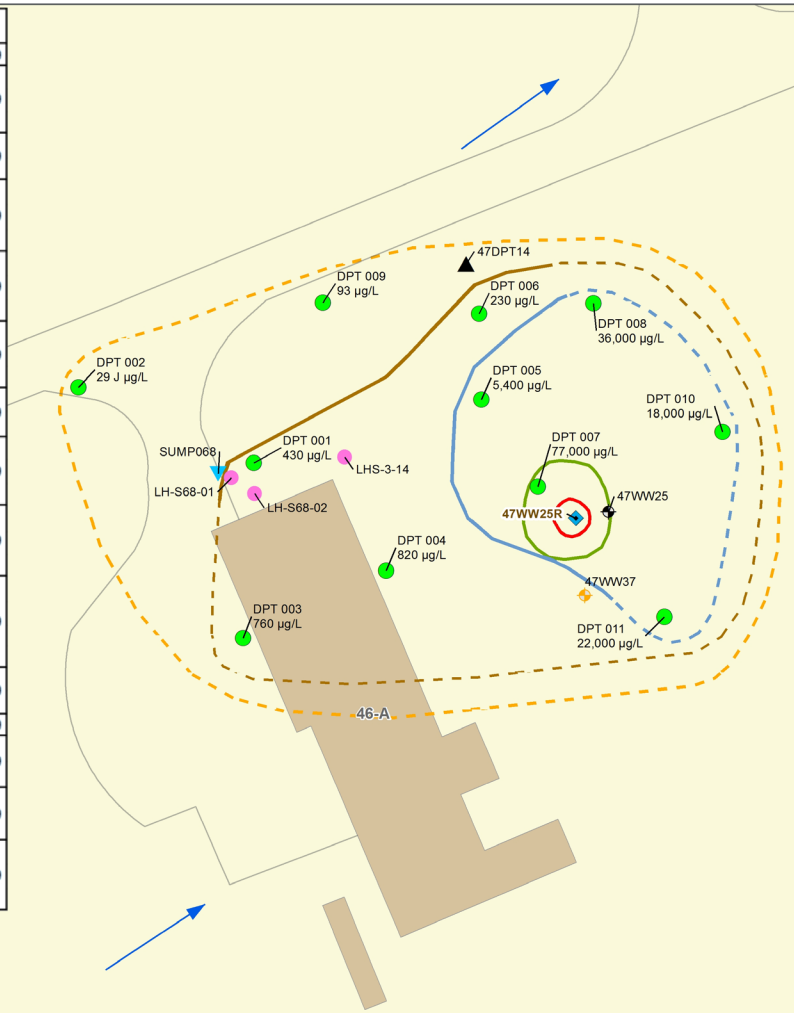
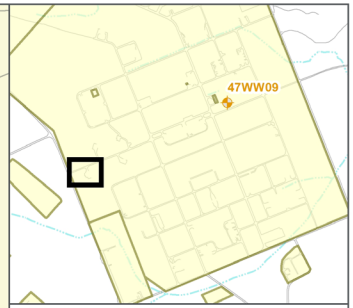
LHAAP-47 Field Work Results - Groundwater

Sample ID	Analyte	Result	Unit	Aquifer/Sample Depth	Date
DPT-001	Trichloroethene	**430**	(µg/L)	Upper Intermediate/40' bgs	11/7/2019
DPT-002	Trichloroethene	**29 J**	(µg/L)	Upper Intermediate/44' bgs	11/6/2019
	cis-1,2-Dichloroethene	0.99 J	(µg/L)		
	Toluene	0.71 J	(µg/L)		
DPT-003	Trichloroethene	**760**	(µg/L)	Upper Intermediate/40' bgs	11/6/2019
	Methylene Chloride	**23 J**	(µg/L)		
DPT-004	Trichloroethene	**820**	(µg/L)	Upper Intermediate/38' bgs	11/6/2019
	cis-1,2-Dichloroethene	24 J	(µg/L)		
	Methylene Chloride	**24 J**	(µg/L)		
DPT-005	Trichloroethene	**5,400**	(µg/L)	Upper Intermediate/34' bgs	11/7/2019
	cis-1,2-Dichloroethene	**93 J**	(µg/L)		
	Methylene Chloride	**94 J**	(µg/L)		
DPT-006	Trichloroethene	**230**	(µg/L)	Upper Intermediate/35' bgs	11/6/2019
	cis-1,2-Dichloroethene	4.2 J	(µg/L)		
	Methylene Chloride	**6.6 J**	(µg/L)		
DPT-007	Trichloroethene	**77,000**	(µg/L)	Upper Intermediate/36' bgs	11/6/2019
	cis-1,2-Dichloroethene	**840 J**	(µg/L)		
DPT-008	Trichloroethene	**36,000**	(µg/L)	Upper Intermediate/36' bgs	11/7/2019
	cis-1,2-Dichloroethene	**820**	(µg/L)		
	Methylene Chloride	**210 J**	(µg/L)		
DPT-009	Trichloroethene	**93**	(µg/L)	Upper Intermediate/40' bgs	11/6/2019
	cis-1,2-Dichloroethene	3	(µg/L)		
	Acetone	5.3 J	(µg/L)		
DPT-010	Trichloroethene	**1,800**	(µg/L)	Upper Intermediate/36' bgs	11/7/2019
	cis-1,2-Dichloroethene	**1,300**	(µg/L)		
	Methylene Chloride	**200 J**	(µg/L)		
	Vinyl Chloride	**97 J**	(µg/L)		
DPT-011	Trichloroethene	**22,000**	(µg/L)	Upper Intermediate/38' bgs	11/7/2019
	cis-1,2-Dichloroethene	**1,500**	(µg/L)		
47WW09	1,4-Dioxane	**37**	(µg/L)	Shallow Intermediate/33' bgs	11/7/2019
47WW25R-35	Trichloroethene	**130,000**	(µg/L)	Upper Intermediate/35' bgs	11/8/2019
	cis-1,2-Dichloroethene	**2,100 J**	(µg/L)		
47WW25R-38	Trichloroethene	**140,000**	(µg/L)	Upper Intermediate/38' bgs	11/8/2019
	cis-1,2-Dichloroethene	**2,600**	(µg/L)		
47WW37	Trichloroethene	**190**	(µg/L)	Intermediate/61' bgs	11/8/2019
	cis-1,2-Dichloroethene	13	(µg/L)		
	Methylene Chloride	**61 J**	(µg/L)		





LEGEND

- DPT Boring Locations (up to 40 ft bgs)
- 2019 Upper Inter. MW
- Inter. MW
- Shallow MW
- DPT
- SB (Soil Boring Shaw, 2010)
- SUMP

Contaminant Levels

- TCE > 5.0 µg/L TRRP $^{GW}GW_{Ing}$ PCL
- TCE > 100 µg/L
- TCE > 5,000 µg/L
- TCE > 50,000 µg/L
- TCE > 100,000 µg/L
- Groundwater Flow Direction
- Road
- Stream
- Building
- LHAAP-47
- LHAAP Site

NOTES: Bold = Concentration exceeds TRRP GWGWIng PCL or EPA MCL

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GROUNDWATER SAMPLE RESULTS

TECHNICAL MEMORANUM: LHAAP-47
INTERIM POST-SCREENING INVESTIGATION
ADDENDUM 2 REPORT

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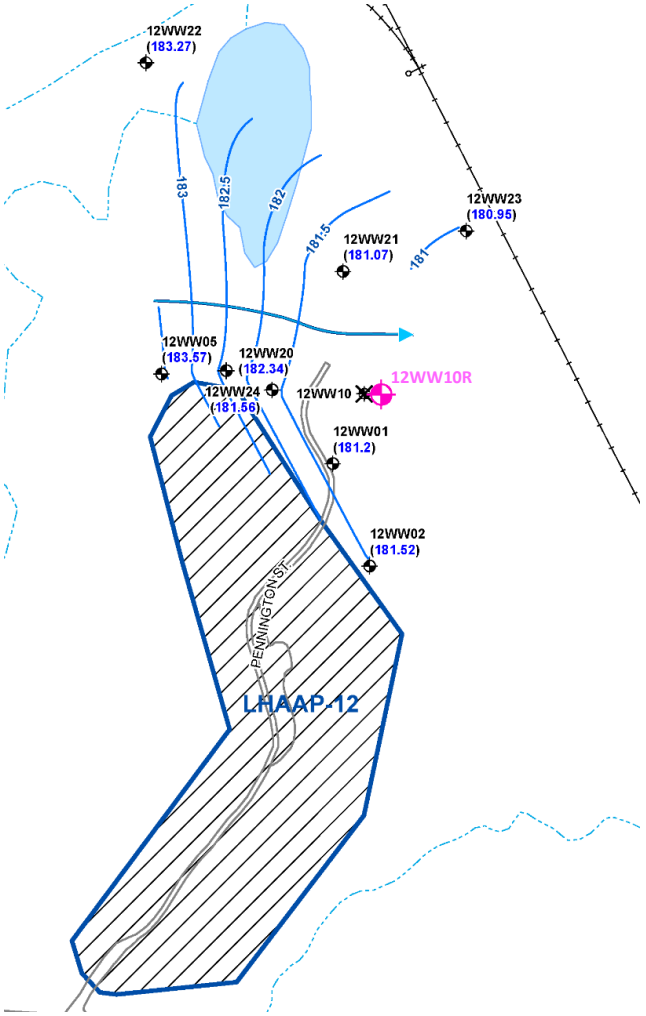
Five Year Review Update

- The Five Year Review recommended new monitoring wells at LHAAP-12 (1) and LHAAP-67 (2) to refine the delineation of the groundwater plumes
- The Five Year Review recommended implementation of the contingency remedy at LHAAP-50
- A new well was installed at LHAAP-50 to refine the plume delineation and support the contingency remedy design
- Wells were installed at all three sites in late July and early August 2019

LHAAP-12 New Well Location

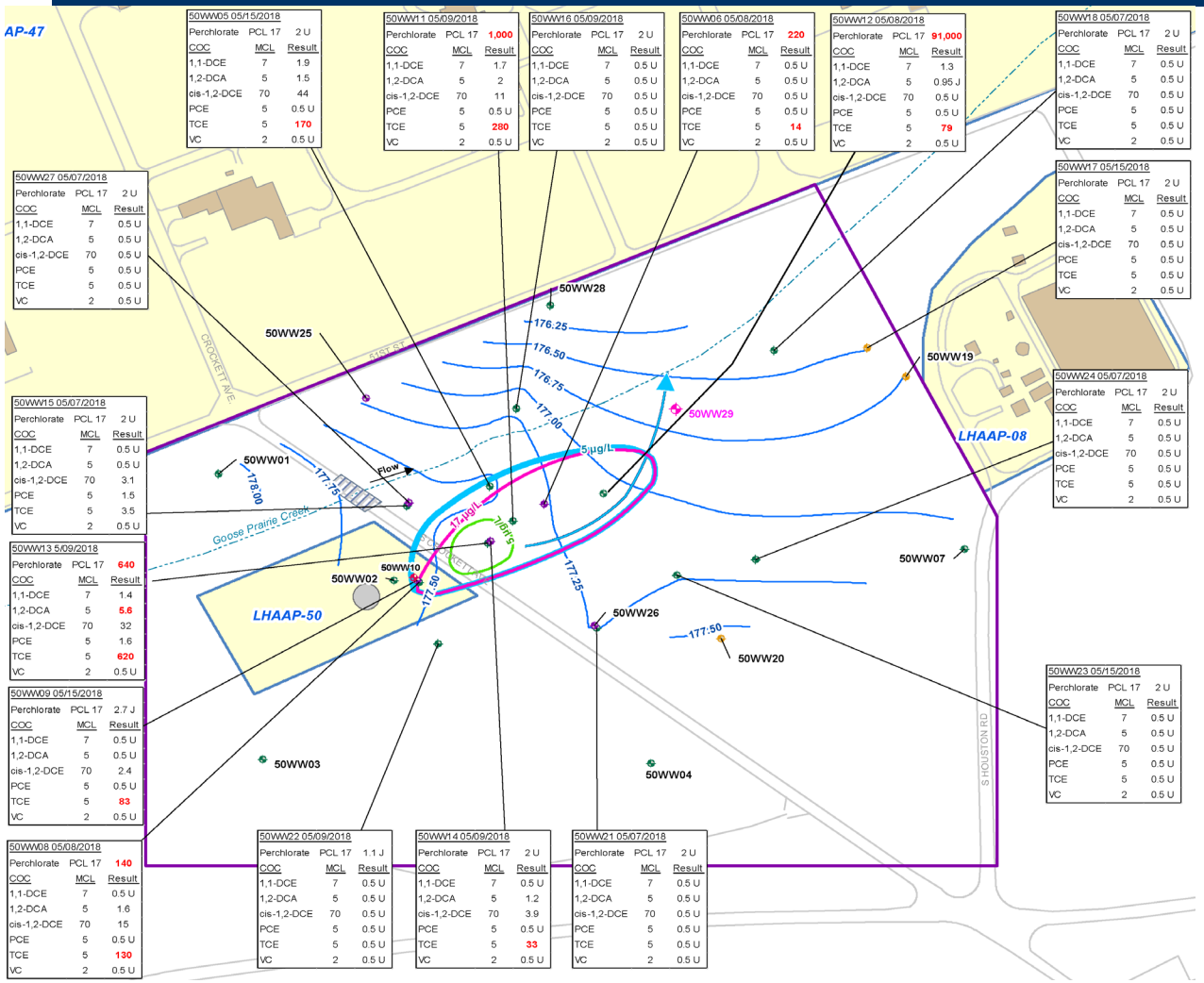


Five Year Review New Well Installations

- LHAAP-12: A sample from the new well (12WW10R) was collected in December 2019; laboratory data has not yet been validated
- LHAAP-50: The new well (50WW29) did not contain detectable COCs in the November 2019 RA(O) sample
- LHAAP-67: Both new wells (67WW17 and 67WW18) did not contain detectable COCs in the October 2019 RA(O) samples

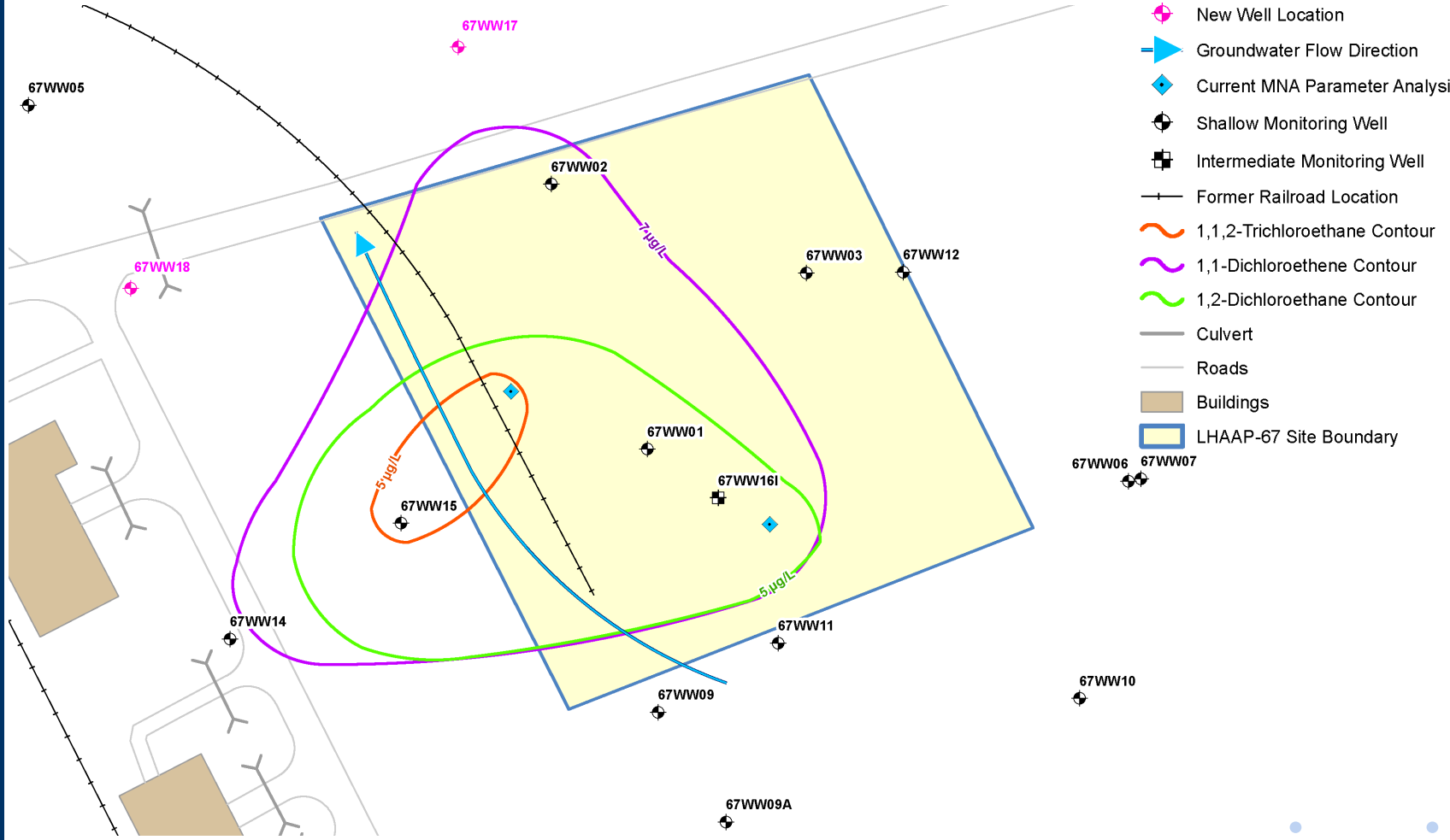
Restoration Advisory Board Meeting

LHAAP-50 New Well Location



Restoration Advisory Board Meeting

LHAAP-67 New Well Locations



Next RAB Meeting Schedule & Closing Remarks

- Schedule April 2020 RAB Meeting
- Other Issues/Remarks
- Thank you for coming