Williams Petroleum Services, LLC
One Williams Center
P.O. Box 3483
Tulsa, OK 74101-3483

May 5, 2020

Mr. Don Lininger, CHMM
Chief, Waste Remediation & Permitting
Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Re: Quarterly Update – 1st Quarter 2020
Former Augusta Refinery (FAR) RCRA Facility Investigation (RFI)
Williams Petroleum Services (WPS), LLC
Augusta, Kansas – KSD007235138

Dear Mr. Lininger:

This letter is offered as the report of investigation activities at the Former Augusta Refinery (FAR) in accordance with Section X, "Reporting," of the Administrative Order on Consent dated October 24, 2003, Docket No. RCRA-07-2004-0009. This report addresses activities occurring during the period of January 1 through March 31, 2020.

Description of Activities

- In accordance with the August 26, 2015 LNAPL Corrective Measures Study (CMS) Work Plan Addendum, completed routine manual and passive light non-aqueous phase liquid (LNAPL) recovery efforts for the continued evaluation of LNAPL removal efficacy.
- Downloaded transducer data and collected water levels as part of the continued Water Balance evaluation through the ongoing monitoring of water level data per the September 11, 2013 scope of work.
- In correspondence dated January 17, 2020, the 4th quarter 2019 Quarterly Report was submitted to the USEPA and KDHE.
- On February 3, 2020, KDHE performed an on-site inspection of the facility's Kansas Water Pollution Control Permit. KDHE indicated that the facility was in compliance with the permit.
- In correspondence dated February 5, 2020, a report with additional investigation data for the NuStar AOC was submitted to the USEPA and KDHE.
- In correspondence dated February 27, 2020, the annual SWMU 1 and 2 monitoring report was submitted to the KDHE.

- In correspondence dated March 25, 2020, results of the groundwater sampling event completed in the fall of 2019 were submitted to USEPA and KDHE.
- On March 12, 2020, completed 1st quarterly NPDES sampling.

Summary of All Findings

- Appendix A presents a summary of the 2019 Walnut River AOI monitoring.

Summaries of All EPA/KDHE Approved Changes

- None.

Summaries of All Contacts

- See description of activities.

Summaries of Problems Encountered

- Due to restrictions associated with the COVID virus, the planned project update meeting with USEPA and KDHE for April 21, 2020 was postponed to a date to be determined later.

Actions to Rectify Problems

- A project update meeting will be scheduled once COVID restrictions are removed.

Changes in Key Project Entities

- None.

Projected Work for the Next Reporting Period

The following activities will be performed or initiated during the next reporting period:

- Continue LNAPL monitoring and removal.
- Continue quarterly NPDES monitoring.
- Continue pilot test monitoring activities.

Other Relevant Documentation

- None

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to evaluate the information submitted. I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those identified portion(s) of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared in accordance with the procedures designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, or the immediate supervisor of such person(s), the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for

submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please provide all written correspondence regarding this Quarterly Update directly to Mr. Lee Andrews, with Williams Petroleum Services, LLC. If you have any questions, do not hesitate to contact Mr. Andrews at (918) 573-6912.

Sincerely,
Williams Petroleum Services, LLC

Mark A. Gebbia
Vice President, Environmental, Regulatory & Permitting

c: Gary Blackburn, KDHE
Lee Andrews, Williams Petroleum Services, LLC
David Way, Aptim Environmental & Infrastructure, LLC.

Appendix A

Appendix A
Walnut River AOI Interim Corrective Measure 2019 Monitoring
Former Augusta Refinery
Augusta, Kansas
May 5, 2020

Walnut River AOI Interim Corrective Measure 2019 Monitoring

Per the Operations and Maintenance Plan, monitoring and sampling activities were completed at the Walnut River area of interest (WRAOI). These activities included revegetation monitoring, light non-aqueous phase liquid recovery, surface water sampling, and Permeable Adsorptive Barrier (PAB) performance monitoring. Installation of the PAB was completed at the end of February 2016.

Revegetation Monitoring

The observed vegetation within the disturbed area of the WRAOI has continued to fill in with new grass throughout the last year. The area was mowed in December 2019 and does not appear to require any over seeding at this time.

LNAPL Recovery

Monitoring wells WRAOI-16-01 and WRAOI-16-02 are gauged on a monthly basis during other site wide monitoring activities. Both monitoring wells have had measurable LNAPL at some point during the 2019 monitoring activities. Monitoring well WRAOI-16-01 has had no measurable LNAPL most of the year with 0.10 feet of LNAPL measured during the December monitoring event. Monitoring well WRAOI-16-02 has had a trace to as much as 0.34 feet of LNAPL. LNAPL was removed as needed by bailing or peristaltic pump. The monthly gauging data for these two monitoring wells is included in the attached field notes.

Surface Water Sampling

Performance acceptability of the PAB is measured by evaluating surface water quality at locations noted as Former Seep-07 and Former Seep-08 and verification that no seeps are visible at the riverbank along the extent of the PAB. As specified in the Operations and Maintenance Plan, the flow rate of the Walnut River should be less than 50 cubic feet per second (cfs) for collection of representative surface water samples.

Due to significant precipitation events in 2018 and 2019, the Walnut River flow rate was higher than the 50 cfs threshold for most of 2019, preventing surface water sampling in December 2018 and June 2019. During the December 12, 2019 surface water sampling event the USGS gauging station for the Walnut River appeared to be measuring higher than normal and with erratic readings ranging from a river flow of 302 to 425 cfs. At the same time the upstream gauge on the Walnut River near El Dorado measured approximately 25 cfs. The USGS was notified of by email of the erratic gauge readings for the Walnut River near Augusta.

Biased surface water samples were collected from the western bank of the Walnut River east of the historical locations of former Seep-07 and former Seep-08 sampling locations on December 12, 2019. A background surface water sample is also collected from the west bank of the Walnut River, approximately 20 to 30 feet up stream of the PAB.

The Walnut River surface water samples were analyzed per the O&M Plan for target volatile organic compounds (VOC analysis by EPA Method 8260), target semi-volatile organic compounds (SVOC analysis by EPA Method 8270), and target total metals (total metals only by EPA Method 6010 and arsenic by EPA Method 6020). A surface water sample was also collected at each sampling location for hardness as calcium carbonate by Standard Methods 2340C. A summary of the surface water sampling results are shown in **Table 1**. Complete laboratory results for the surface water samples collected on December 12, 2019 are attached.

The laboratory analytical results for the surface water samples were screened against the Kansas Surface Water Quality Standard. If there is no Kansas Surface Water Quality Standard for the constituent, then the results were compared to the United States Environmental Protection Agency (USEPA) Primary Drinking Water Standard Maximum Contaminant Level (MCL).

All detected inorganics were less than their respective standard. Acetone was reported in the former Seep 8 surface water sample at 6.0 µg/l. No other VOCs were detected in the surface water samples collected during the December 2019 sampling event. Trace amounts of naphthalene were reported in both the former Seep-8 and the upstream surface water samples. The average concentrations of inorganic analytical results for the down-gradient surface water samples are comparable to the up-gradient surface water analytical results with no notable increase in concentrations.

Monthly inspection of the PAB area did not indicate the presence of any hydrocarbon seeps along the length of the PABs as documented in the inspection forms. There continues to be residual iron bacteria noted in the area of the former Seep-8 location that was not excavated during the installation of the PAB, however, no evidence of a hydrocarbon seep was observed.

PAB Performance Monitoring

The long-term PAB monitoring for remaining adsorption capacity calculations are included in **Table 2**. Trace amounts of LNAPL prevented groundwater sampling of several of the monitoring wells during the 2019 groundwater sampling event in the area of the WRAOI. Therefore, the same benzene concentration of 3,760 µg/l was used. The benzene concentration of 3,760 µg/l is the maximum benzene concentration observed in monitoring well WRFAR10-03S during the 2010 groundwater sampling event.

The recent arsenic data from the 2019 groundwater sampling event of 175 µg/l for monitoring well DG-03D was used in place of the previous concentration of 195 µg/l used in the June 2017 calculation. The updated estimates of the remaining adsorption capacities of the AquaGate+Organoclay and the AquaGate+ProvectIRM portions of the PAB were found to be from 28.9 (using benzene saturation limit to represent LNAPL) to 501.6 years (using maximum benzene concentration observed in monitoring well WRFAR10-03S during the 2010 groundwater sampling event) for the AquaGate+Organoclay and 13.9 years (using most recent highest actual dissolved arsenic concentrations) for the AquaGate+ProvectIRM.

Updated capacities represent worst case scenarios where 100% of the PAB materials are exposed to either highest dissolved benzene/arsenic concentrations or LNAPL. Capacity calculations do not include the AquaGate+PAC portion of the PAB which would add several additional years to the PAB adsorption capacity.

Table 1
Walnut River Surface Water Sampling
Summary of Analytical Results

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

SAMPLE TYPE: Water

SITE	DATE	1,1,1-trichloro ethane (ug/l)	1,1-Dichloro ethane (ug/l)	1,1-Dichloro ethylene (ug/l)	Acetone (ug/l)	Benzene (ug/l)	Carbon Disulfide (ug/l)	Chlorobenzene (ug/l)
Maximum Contaminant Level		200		7		5		100
KDHE Surface Water SL		200		7		1.2[(b)]		100
Former Seep 7	7/20/2017	<1.0	<1.0	<1.0	<50	<1.0	<5.0	<1.0
	12/11/2017	<1.0	<1.0	<1.0	<50	<1.0	<5.0	<1.0
	6/15/2018	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0
	12/12/2019	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0
Former Seep 8	7/20/2017	<1.0	<1.0	<1.0	<50	<1.0	<5.0	<1.0
	12/11/2017	<1.0	<1.0	<1.0	<50	<1.0	<5.0	<1.0
	6/15/2018	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0
	12/12/2019	<1.0	<1.0	<1.0	6.0	<1.0	<2.0	<1.0
Upstream	7/20/2017	<1.0	<1.0	<1.0	<50	<1.0	<5.0	<1.0
	12/11/2017	<1.0	<1.0	<1.0	<50	<1.0	<5.0	<1.0
	6/15/2018	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0
	12/12/2019	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0

[x]=Indicates a result greater than or equal to the method detection limit but Less than Reporting Limit

Maximum Contaminant Level = Maximum Contaminant Level EPA Spring 2012 Edition of the Drinking Water Standard and Health Advisories
KDHE Surface Water SL = Domestic Water Supply Screening Levels, Kansas Surface Water Quality Standards: Tables of Numeric Criteria, December 15, 2017
(a) = Criterion not available
(b) = US EPA has promulgated criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36

Table 1
Walnut River Surface Water Sampling
Summary of Analytical Results

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

SAMPLE TYPE: Water

SITE	DATE	Ethylbenzene (ug/l)	MTBE (ug/l)	Methylene chloride (ug/l)	Tetrachloro ethylene (ug/l)	Toluene (ug/l)	Vinyl chloride (ug/l)	Xylene (total) (ug/l)
Maximum Contaminant Level		700		5	5	1000	2	10000
KDHE Surface Water SL		700		5	0.8[(b)]	1000	2	10000
Former Seep 7	7/20/2017	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<3.0
	12/11/2017	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<3.0
	6/15/2018	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	12/12/2019	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
Former Seep 8	7/20/2017	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<3.0
	12/11/2017	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<3.0
	6/15/2018	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	12/12/2019	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
Upstream	7/20/2017	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<3.0
	12/11/2017	<1.0	<1.0	<5.0	<1.0	<1.0	<1.0	<3.0
	6/15/2018	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0
	12/12/2019	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	<1.0

[x]=Indicates a result greater than or equal to the method detection limit but Less than Reporting Limit

Maximum Contaminant Level = Maximum Contaminant Level EPA Spring 2012 Edition of the Drinking Water Standard and Health Advisories
KDHE Surface Water SL = Domestic Water Supply Screening Levels, Kansas Surface Water Quality Standards: Tables of Numeric Criteria, December 15, 2017
(a) = Criterion not available
(b) = US EPA has promulgated criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36

Table 1
Walnut River Surface Water Sampling
Summary of Analytical Results

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

SAMPLE TYPE: Water

SITE	DATE	2-Methyl naphthalene (ug/l)	Benzoic acid (ug/l)	Penta-chlorophenol (ug/l)	Bis(2-ethyl hexyl)phthalate (BEHP) (ug/l)	Chrysene (ug/l)	Naphthalene (ug/l)	Phenanthrene (ug/l)
Maximum Contaminant Level				1	6.0			
KDHE Surface Water SL				0.28[(b)]	1.8[(b)]	0.0038	(a)	(a)
Former Seep 7	7/20/2017	<5.8	<23	<29	<5.8	<0.10	<0.10	<0.10
	12/11/2017	<5.0	[3.9]	<25	<5.0	<0.10	<0.10	<0.10
	6/15/2018	<0.10	0.38	<0.20	2.9	<0.10	[0.027]	<0.10
	12/12/2019	<0.10	0.48	<0.20	<0.20	<0.10	<0.10	<0.10
Former Seep 8	7/20/2017	<6.7	<27	<33	<6.7	<0.11	<0.11	<0.11
	12/11/2017	<1.6	<20	<25	<5.0	<0.10	<0.10	<0.10
	6/15/2018	[0.033]	0.52	<0.20	[0.078]	<0.10	[0.051]	<0.10
	12/12/2019	<0.10	0.43	<0.20	<0.20	<0.10	0.25	<0.10
Upstream	7/20/2017	<5.9	<24	<29	<5.9	<0.12	<0.12	<0.12
	12/11/2017	<5.0	<20	<25	<5.0	<0.10	<0.10	<0.10
	6/15/2018	<0.10	0.25	<0.20	<0.20	<0.10	<0.10	<0.10
	12/12/2019	<0.10	0.43	<0.20	<0.20	<0.10	0.19	<0.10

[x]=Indicates a result greater than or equal to the method detection limit but Less than Reporting Limit

Maximum Contaminant Level = Maximum Contaminant Level EPA Spring 2012 Edition of the Drinking Water Standard and Health Advisories
KDHE Surface Water SL = Domestic Water Supply Screening Levels, Kansas Surface Water Quality Standards: Tables of Numeric Criteria, December 15, 2017
(a) = Criterion not available
(b) = US EPA has promulgated criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36

Table 1
Walnut River Surface Water Sampling
Summary of Analytical Results

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

SAMPLE TYPE: Water

SITE	DATE	Pyrene (ug/l)	Total Arsenic (ug/l)	Dissolved Arsenic (ug/l)	Total Barium (ug/l)	Dissolved Barium (ug/l)	Total Cadmium (ug/l)	Dissolved Cadmium (ug/l)
Maximum Contaminant Level			10	10	2000	2000	5	5
KDHE Surface Water SL		960[(b)]	10	10	2000	2000	5	5
Former Seep 7	7/20/2017	<0.10	[1.6]	[1.9]	[157]	[158]	<5.00	<5.00
	12/11/2017	<0.10	[1.4]	[2.2]	[169]	[159]	<5.00	<5.00
	6/15/2018	<0.10	6.26	6.02	158	152	<2.00	<2.00
	12/12/2019	<0.10	[1.84]	[1.36]	138	140	<2.00	<2.00
Former Seep 8	7/20/2017	<0.11	<10	[2.2]	[155]	[156]	<5.00	<5.00
	12/11/2017	<0.10	[1.8]	[1.6]	[170]	[163]	<5.00	<5.00
	6/15/2018	<0.10	7.38	6.78	158	155	<2.00	<2.00
	12/12/2019	<0.10	[1.86]	[1.52]	132	136	<2.00	<2.00
Upstream	7/20/2017	<0.12	[1.6]	[2.0]	[150]	[148]	<5.00	<5.00
	12/11/2017	<0.10	[1.9]	<10	[166]	[160]	<5.00	<5.00
	6/15/2018	<0.10	6.12	5.92	153	159	<2.00	<2.00
	12/12/2019	<0.10	[1.42]	[1.58]	132	156	<2.00	<2.00

[x]=Indicates a result greater than or equal to the method detection limit but Less than Reporting Limit

Maximum Contaminant Level = Maximum Contaminant Level EPA Spring 2012 Edition of the Drinking Water Standard and Health Advisories
KDHE Surface Water SL = Domestic Water Supply Screening Levels, Kansas Surface Water Quality Standards: Tables of Numeric Criteria, December 15, 2017
(a) = Criterion not available
(b) = US EPA has promulgated criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36

Table 1
Walnut River Surface Water Sampling
Summary of Analytical Results

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

SAMPLE TYPE: Water

SITE	DATE	Total Chromium (ug/l)	Dissolved Chromium (ug/l)	Total Lead (ug/l)	Dissolved Lead (ug/l)	Total Mercury (ug/l)	Dissolved Mercury (ug/l)	Total Selenium (ug/l)
Maximum Contaminant Level		100	100	15	15	2	2	50
KDHE Surface Water SL		100	100	15	15	2	2	50
Former Seep 7	7/20/2017	<10	<10	<5.0	<5.0	<0.50	[0.036]	<10
	12/11/2017	<10	<10	<5.0	<5.0	<0.50	<0.50	<10
	6/15/2018	<4.00	<4.00	[0.945]	<2.00	[0.030]	<0.200	2.14
	12/12/2019	<4.00	<4.00	<2.00	<2.00	_	<0.200	3.30
Former Seep 8	7/20/2017	<10	<10	[1.2]	<5.0	[0.041]	[0.039]	<10
	12/11/2017	<10	<10	<5.0	<5.0	<0.50	<0.50	<10
	6/15/2018	<4.0	<4.0	[0.890]	<2.00	<0.200	<0.200	2.10
	12/12/2019	<4.0	<4.0	<2.00	<2.00	_	<0.200	2.80
Upstream	7/20/2017	<10	<10	<5.0	<5.0	[0.042]	<0.50	<10
	12/11/2017	<10	<10	<5.0	<5.0	<0.50	<0.50	<10
	6/15/2018	[0.507]	<4.00	[0.991]	<2.00	[0.0310]	[0.0330]	[1.90]
	12/12/2019	<4.00	<4.00	<2.00	<2.00	_	<0.200	3.05

[x]=Indicates a result greater than or equal to the method detection limit but Less than Reporting Limit

Maximum Contaminant Level = Maximum Contaminant Level EPA Spring 2012 Edition of the Drinking Water Standard and Health Advisories
KDHE Surface Water SL = Domestic Water Supply Screening Levels, Kansas Surface Water Quality Standards: Tables of Numeric Criteria, December 15, 2017
(a) = Criterion not available
(b) = US EPA has promulgated criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36

Table 1
Walnut River Surface Water Sampling
Summary of Analytical Results

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

SAMPLE TYPE: Water

SITE	DATE	Dissolved Selenium (ug/l)	Total Silver (ug/l)	Dissolved Silver (ug/l)	Hardness (mg/l)
Maximum Contaminant Level		50			
KDHE Surface Water SL		50	100	100	
Former Seep 7	7/20/2017	<10	<10	<10	216
	12/11/2017	[3.3]	<10	<10	297
	6/15/2018	3.78	<2.00	<2.00	222
	12/12/2019	3.79	<2.00	<2.00	273
Former Seep 8	7/20/2017	<10	<10	<10	226
	12/11/2017	<10	<10	<10	299
	6/15/2018	3.41	<2.00	<2.00	222
	12/12/2019	2.99	<2.00	<2.00	260
Upstream	7/20/2017	<10	<10	<10	236
	12/11/2017	[3.8]	<10	<10	300
	6/15/2018	3.62	<2.00	<2.00	220
	12/12/2019	3.97	<2.00	<2.00	260

[x]=Indicates a result greater than or equal to the method detection limit but Less than Reporting Limit

Maximum Contaminant Level = Maximum Contaminant Level EPA Spring 2012 Edition of the Drinking Water Standard and Health Advisories
KDHE Surface Water SL = Domestic Water Supply Screening Levels, Kansas Surface Water Quality Standards: Tables of Numeric Criteria, December 15, 2017
(a) = Criterion not available
(b) = US EPA has promulgated criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36

Table 2

Permeable Adsorptive Barrier Capacity Calculation
Walnut River AOI ICM Post-Construction Performance Monitoring
July 2016 through December 2019

Former Augusta Refinery, Augusta, KS
Williams Petroleum Services, LLC

AquaGate + Organoclay								
Estimate of Contaminant Adsorption Capacity Starting June 2016 (lbs)[1]	Contaminant	Concentration (µg/l)	Conductivity K (m/day)[2]	i[3]	Area (m^2)[4]	Estimated Mass Flux (lbs/year)	Estimate of Remaning Contaminant Adsorption Capacity (lbs)	Estimated Remaining Treatment Time for Organoclay only (years)
27981.2	Benzene[5]	3,760	8.64	0.0204	104	55.4	27787.3	501.6
27709	Benzene[6]	58,000	8.64	0.0204	104	854	24720.0	28.9
AquaGate + ProvectIRM								
Estimate of Arsenic Sequestration Capacity with ProvectIRM with Aquagate June 2016 (lbs)[1]	Contaminant	Concentration (µg/l)	Conductivity K (m/day)[2]	i[3]	Area (m^2)[4]	Estimated Mass Flux (lbs/year)	Estimate of Remaning Contaminant Adsorption Capacity (lbs)	Estimate Remaining Time for Arsenic Sequestration (years)
45.5	Arsenic[7]	175	8.64	0.0204	104	2.58	35.8	13.9

[1]Treatment capacity provided by John Collins, Aquablok 7/2/15 (Burns&McDonnell, Sept. 13, 2016).

[2]Conductivity of Auagate + Organoclay (Burns&McDonnell, Sept. 13, 2016).

[3]Highest gradient reported in AOI report (Shaw, 2011)

[4]Based on PAB design drawings of 8 feet deep and 140 feet long (Burns&McDonnell, Sept. 13, 2016).

[5]Maximum benzene concentration observed 2010 sampling event (WRFAR10-03S). WRFAR10-03S had LNAPL during the 2019 groundwater sampling event and was not sampled.

[6]API data (1985): Expected concentration of benzene in water (Cw) from a typical unleaded gasoline, https://info.ngwa.org/GWOL/pdf/910155295.pdf.

[7]Maximum arsenic concentration observed 2019 sampling event (DG-03D).

Assumptions:
1. No transfer of contaminant from vadose zone
2. Excavation/Capping inhibits furher migration of free phase

Mass Flux = C*K*i*Area
C = Concentration of benzene upgradient of Permeable Adsorptive Barrier (PAB)
K = Conductivity of Aquagate + Organoclay
i = Groundwater gradient up gradient of PAB.
1 g/day = 0.804687 lbs/yr

Former Augusta Refinery Monthly Site Inspection Form

Project # 15256/-1152/320
Date : 1-8-19
Weather: Clear 50°F
Inspector: Plis/Osborn

Check List	Comments
Overhead Line fuses:	O/C
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	O/C
Sign IN/OUT sheet Check:	O/C
SWPP drainage and site ponding water check:	Recent rains, water just up into N/S ditch end of swale 17
South Pond Info: 5.83	Water level ~1' below discharge
North Pond info: 6.18	water level ~ 0.25' into discharge pipe. No discharge
Pump House check: East & West Pumps	West Pump pulled for replacement. East Pump run x/mo
Flood corridor check:	Grass just mowed
River Outfall check (Qtrly): (check valve annually)	
Fence and Gate Breech checks:	None noted
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	Cap Inspection completed looks good
Site mowing and growth check:	Early bird just finished site mowing mid dec,
River AOI Inspection:	River has been up slightly
Product Storage Unit Inspection:	O/C
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561 11521320
Date : 1-7-19
Weather: Clear, 56°
Inspector: D. Ceniti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	-	9.07	
FAR10-6S	-	7.78	
FAR10-7S	-	6.37	
GM-1SR	9.81	9.86	Removed 4oz of product
GM-2S	12.82	12.92	Removed 3oz of product
GM-3S	-	4.75	
GM-6SR	-	6.12	
GM-9	-	9.20	
WRAOI16-02	21.03	21.04	Trace
WRAOI16-01	-	22.16	

Former Augusta Refinery Routine Site Check Inspection Form

Project # 152561
Date : 2/21/19
Weather: Cold
Inspector: A. Hallier

Check List	Comments
Overhead Line fuses:	Good
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	Good
Sign IN/OUT sheet Check:	Good
SWPP drainage and site ponding water check:	Good
South Pond Info:	Good
North Pond info:	Good
Pump House check: East & West Pumps	G
Flood corridor check:	Good
River Outfall check (Qtrly): (check valve annually)	
Fence and Gate Breech checks:	Good
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	Good
Site mowing and growth check:	Good
Misc Site Info:	

Former Augusta Refinery Routine Site Check Inspection Form

Project # 152501
Date : 2/21/19
Weather: Cold
Inspector: A. Haller

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	—	10.40	
FAR10-6S	—	7.90	
FAR10-7S	—	6.82	
GM-1SR	10.16	16.25	
GM-2S	—	13.00	
GM-3S	—	5.40	
GM-6SR	—	6.15	
GM-9	—	6.31	
WRAOI16-02	21.90	22.03	Pumped 4oz Prod 4L oz water Tracie 21.91
WRAOI16-01	—	22.87	

Former Augusta Refinery Monthly Site Inspection Form

Project # 15-2561
Date : 3/11/19
Weather: Cool
Inspector: A. HALLER

Check List	Comments
Overhead Line fuses:	GOOD
Locks at, Gate 1: GOOD Gate 15: GOOD Gate 12: GOOD Gate 16: GOOD Gate 14: GOOD Gate 17: GOOD	
Sign IN/OUT sheet Check: OKAY	
SWPP drainage and site ponding water check: OKAY	
South Pond Info:	CULVERT BEING ADDED BETWEEN THE TWO PONDS.
North Pond info:	
Pump House check: East & West Pumps	EAST OFF DUE TO ELECTRICAL WEST OFF FOR REPAIRS
Flood corridor check:	GOOD
River Outfall check (Qtrly): (check valve annually)	GOOD
Fence and Gate Breech checks:	GOOD
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	OKAY
Site mowing and growth check:	GOOD
River AOI Inspection:	GOOD
Product Storage Unit Inspection:	GOOD
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561
Date : 3/11/19
Weather: Cool
Inspector: A. HALLER

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	—	3.87	1535
FAR10-6S	—	7.60	1510
FAR10-7S	—	5.82	1505
GM-1SR	8.36	8.33	3 oz PRODUCT REMOVED 4 oz WATER REMOVED
GM-2S	TRACE	11.41	
GM-3S	—	4.31	
GM-6SR	—	5.14	
GM-9	—	4.28	
WRAOI16-02	18.02	18.06	1 oz PRODUCT REMOVED 1 oz WATER REMOVED
WRAOI16-01	—	7.85	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561.121
Date : 4-26-19
Weather: Sunny
Inspector: P. Ceniti

Check List	Comments
Overhead Line fuses:	Good
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	Good
Sign IN/OUT sheet Check:	Good
SWPP drainage and site ponding water check:	Good
South Pond Info:	Good
North Pond info:	Good
Pump House check: East & West Pumps	East pump running. Turned off pump. West pump not running.
Flood corridor check:	Good
River Outfall check (Qtrly): (check valve annually)	
Fence and Gate Breech checks:	Good / Two metal poles laying over on fence at N. Gate
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	Good
Site mowing and growth check:	Good
River AOI Inspection:	Good
Product Storage Unit Inspection:	Some drum labels are starting to fade & cannot read labels
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561.121
Date : 4-26-19
Weather: Sunny
Inspector: D. Ceniti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	8.18	
FAR10-6S	-	7.66	
FAR10-7S	-	6.39	
GM-1SR	8.05	8.75	4 oz product removed
GM-2S	-	11.40	
GM-3S	-	4.68	
GM-6SR	-	5.85	
GM-9	-	4.05	
WRAOI16-02	20.32	20.66	1/2 product removed
WRAOI16-01	-	21.30	

Former Augusta Refinery Monthly Site Inspection Form

Project # 18256/- 121320
Date : 5-25-19
Weather: Lots of Rain
Inspector: Mil Osborne

Check List	Comments
Overhead Line fuses:	OK
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	OK
Sign IN/OUT sheet Check:	OK
SWPP drainage and site ponding water check:	Site flooded from recent rains
South Pond Info:	both ponds full ~ 6" above culvert
North Pond Info:	on 122.75'
Pump House check: East & West Pumps	Wet lower pump failed. East lower pump down 5-25-19
Flood corridor check:	Whole Work Flooding. Corridor OK
River Outfall check (Qtrly): (check valve annually)	5-21-19 Opened Valve 1270 discharge to Whitehall Because of high water elevation
Fence and Gate Breech checks:	None Noted
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	OK
Site mowing and growth check:	OK
River AOI Inspection:	Low Off one pot lower HOT
Product Storage Unit Inspection:	OK
Other comments:	~21" rain for month of May

Former Augusta Refinery Monthly Site Inspection Form

Project # 152156.122
Date : ~~5-13-19~~ 5-15-19
Weather: Sunny, 77°
Inspector: D. Ceniti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	6.54	
FAR10-6S	–	6.62	
FAR10-7S	–	6.25	
GM-1SR	6.75	6.86	26oz of product removed
GM-2S	T	8.54	
GM-3S	–	4.54	
GM-6SR	–	5.55	
GM-9	-	2.30	
WRAOI16-02	T	16.27	
WRAOI16-01	-	11.65	

Former Augusta Refinery Monthly Site Inspection Form

Project # 15756-121

Date : 6-17-19

Weather:

Inspector: Nick Olsen

Check List	Comments
Overhead Line fuses:	OK, Both pumps are down Lightning strike on May 29
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	OK
Sign IN/OUT sheet Check:	OK
SWPP drainage and site ponding water check:	
South Pond Info:	DTW 7.59
North Pond info:	DTW 8.71
Pump House check: East & West Pumps	- Reset 6" pump started May 30
Flood corridor check:	mowed 29-7
River Outfall check (Qtrly): (check valve annually)	Discharging through outfall 001B1
Fence and Gate Breech checks: None Noted	started 5/21/19 because of site flooding ~21" over road May
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	
Site mowing and growth check:	started Mowing on site mowed level
River AOI Inspection:	OK
Product Storage Unit Inspection:	OK
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561.121
Date : 6-10-19
Weather: Clear
Inspector: D. Lenith

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	7.75	
FAR10-6S	-	6.98	
FAR10-7S	-	6.42	
GM-1SR	T	7.41	
GM-2S	-	9.73	
GM-3S	-	4.70	
GM-6SR	-	5.73	
GM-9	-	2.79	
WRAOI16-02	T	18.38	
WRAOI16-01	T	19.20	

Former Augusta Refinery Monthly Site Inspection Form

Project # 15256 / -122132.0
Date : 7-23-15
Weather: Clear 80°F
Inspector: Phil Ohl

Check List	Comments
Overhead Line fuses:	OK
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	OK
Sign IN/OUT sheet Check:	OK
SWPP drainage and site ponding water check:	OK
South Pond Info: NV 9.37	
North Pond info: NV 9.41	
Pump House check: East & West Pumps	Both pumps are down, 6" rental pump? OK
Flood corridor check:	OK
River Outfall check (Qtrly): (check valve annually)	Dripping slightly. reopened a little and retightened down -
Fence and Gate Breech checks:	None noted
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	OK
Site mowing and growth check:	Started mowing, Needs mowed
River AOI Inspection:	OK river stage @ 43' 1,370 cfs
Product Storage Unit Inspection:	OK
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152516.
Date : 7-16-19
Weather: Clear, 90°
Inspector: D. Ceniti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	10.68	
FAR10-6S	-	7.70	
FAR10-7S	-	8.55	
GM-1SR	10.25	10.35	16 oz product removed
GM-2S	T	13.78	
GM-3S	T	6.70	
GM-6SR	-	10.22	
GM-9	-	7.47	
WRAOI16-02	T	19.38	
WRAOI16-01	-	20.47	

Former Augusta Refinery Monthly Site Inspection Form

Project # 15256-1212320
Date : 8-20-19
Weather: Clear 85°F
Inspector: Phil Osborn

Check List	Comments
Overhead Line fuses:	OK
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	OK
Sign IN/OUT sheet Check:	OK
SWPP drainage and site ponding water check:	OK
South Pond Info:	MW 8.16 [illegible] well TOC
North Pond info:	SWMU-11 9.82 top concrete
Pump House check: East & West Pumps	Running temporary 6" Pump, West pump to be reinstalled end of week & [illegible] East Pump
Flood corridor check:	Weeds mowed, grass 1-2' tall
River Outfall check (Qtrly): (check valve annually)	Checked OK
Fence and Gate Breech checks:	None Noted
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	looks good None Noted.
Site mowing and growth check:	Site Weeds mowed.
River AOI Inspection:	Walnut River is up. flow ~800 cfs
Product Storage Unit Inspection:	label date 7-16-19 looks good.
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561.12121320
Date : 8-20-19
Weather: Hot, 86°
Inspector: D. Cenitti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	11.75	
FAR10-6S	T	8.05	
FAR10-7S	-	6.80	
GM-1SR	9.80	9.94	7oz of product removed
GM-2S	13.17	13.55	46oz of product removed
GM-3S	-	4.88	
GM-6SR	-	10.30	
GM-9	-	7.20	
WRAOI16-02	18.88	18.93	4oz of product removed
WRAOI16-01	-	19.90	

Former Augusta Refinery Monthly Site Inspection Form

Project #: 152561-121 21320
Date: 9-24-19
Weather: Clear 80°F
Inspector: [illegible]

Check List	Comments
Overhead Line fuses:	
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	OK
Sign IN/OUT sheet Check:	OK
SWPP drainage and site ponding water check:	water up into ditch East of SWMU 17
South Pond Info: 8.20	-1226.98 = 1218.78
North Pond info: 3.64	-1219.51 = 1215.87
Pump House check: East & West Pumps	East Pump Pulled / West pump Needs electric hookup
Flood corridor check:	Needs Mowed
River Outfall check (Qtrly): (check valve annually)	Checked last month OK
Fence and Gate Breech checks:	OK
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	OK None Noted
Site mowing and growth check:	Grass tall Needs mowed
River AOI Inspection:	River flowing ~
Product Storage Unit Inspection:	OK [illegible] 7-17-19
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561.12021320
Date : 9-24-19
Weather: Warm, Cloudy
Inspector: D. Cesiti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	11.42	
FAR10-6S	-	11.20	
FAR10-7S	-	7.13	
GM-1SR	10.60	10.90	48oz of product removed
GM-2S	13.55	13.63	4oz of product removed
GM-3S	-	5.30	
GM-6SR	-	10.90	
GM-9	T	7.79	
WRAOI16-02	T	20.80	
WRAOI16-01	-	22.18	

Former Augusta Refinery Monthly Site Inspection Form

Project # 15256/-121 2/120
Date : 10-31-15
Weather: Clear 20°F
Inspector: Phil Osborne

Check List	Comments
Overhead Line fuses:	ok
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	ok complete site drive
Sign IN/OUT sheet Check:	ok
SWPP drainage and site ponding water check:	recently mowed
South Pond Info: 8.44	
North Pond info: 4.07	
Pump House check: East & West Pumps	West pump installed ran earlier need electrician needs to finish electric
Flood corridor check:	East pump pulled,
River Outfall check (Qtrly): (check valve annually)	NA
Fence and Gate Breech checks:	ok
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	ok recently mowed
Site mowing and growth check:	all caps mowed.
River AOI Inspection:	ok w/ some rusted iron bacteria & seep B Room
Product Storage Unit Inspection:	ok river flow ~ 170 cfs
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561.121
Date : 10-28-19
Weather: Cloudy, Cold
Inspector: D. Ceniti

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	10.85	
FAR10-6S	-	7.95	
FAR10-7S	-	7.40	
GM-1SR	10.45	10.86	Removed 70z of product
GM-2S	T	13.35	
GM-3S	-	5.60	
GM-6SR	-	9.89	
GM-9	-	6.70	
WRAOI16-02	20.97	21.08	Removed 3oz of product
WRAOI16-01	-	22.29	

Former Augusta Refinery Monthly Site Inspection Form

Project # _____

Date : 11-27-15

Weather: Clear 35°F

Inspector: Mike Osborne

Check List	Comments
Overhead Line fuses:	o/c
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	ok
Sign IN/OUT sheet Check:	o/c
SWPP drainage and site ponding water check:	
South Pond Info: 8.68	
North Pond info: 4.40	
Pump House check: East & West Pumps	West pump replaced. East pump pulled
Flood corridor check:	recently mowed
River Outfall check (Qtrly): (check valve annually)	N/A
Fence and Gate Breech checks:	None noted
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	o/c
Site mowing and growth check:	Recently mowed.
River AOI Inspection:	some dotted iron staining walked bank o/c @ German Seep B
Product Storage Unit Inspection:	o/c detail
Other comments:	

Former Augusta Refinery Monthly Site Inspection Form

Project # 1525 C1-1212320
Date : 11/22/19
Weather: Clear 35°F
Inspector: Phil Olson

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	one	13.40.	
FAR10-6S	—	8.36	
FAR10-7S	—	6.78	
GM-1SR	11.74	12.36	42 oz product removed 26 oz Water removed
GM-2S	14.43	14.52	6oz product removed 46 oz Water removed
GM-3S	—	6.51	Product not detected
GM-6SR	—	11.50	Product not detected
GM-9	Trace	8.09	Trace product
WRAOI16-02	21.74	21.80	3oz product removed 30oz Water removed
WRAOI16-01	—	23.01	Product not detected

Former Augusta Refinery Monthly Site Inspection Form

Project # 1525G/-121
Date : 12/18/19
Weather: Sunny, Cold, 50°F
Inspector: Craig Taylor

Product and Water Level Information for wells that historically shown LNAPL

Well	Product Level (TOC)	Water Level (TOC)	Comments/Product Removed
FAR10-5S	T	14.05	
FAR10-6S	T	8.52	
FAR10-7S	—	8.97	
GM-1SR	12.71	13.25	68oz product Removed 102 oz Water Removed
GM-2S	15.10	15.38	8oz product Removed 160z water Removed
GM-3S	T	6.90	
GM-6SR	—	12.02	
GM-9	—	8.76	
WRAOI16-02	22.27	22.31	1oz product Removed 220z Water Removed
WRAOI16-01	23.60	23.70	1oz product Removed 20oz Water Removed

Former Augusta Refinery Monthly Site Inspection Form

Project # 152561- 12/2(3 20
Date : 12-23-19
Weather: St Ptly Cloudy 60-65°F
Inspector: [illegible signature]

Check List	Comments
Overhead Line fuses:	O/C
Locks at, Gate 1: Gate 15: Gate 12: Gate 16: Gate 14: Gate 17:	O/C
Sign IN/OUT sheet Check:	O/C
SWPP drainage and site ponding water check:	recently mowed - water level is up - Need to pump down
South Pond Info: TOC=1226.98	
North Pond Info: TOC=1219.57	DTW 4.61 pond elevation = 1214.90
Pump House check: East & West Pumps	ran west pump 14:12 to 15:40
Flood corridor check:	recently mowed
River Outfall check (Qtrly): (check valve annually)	O/C
Fence and Gate Breech checks:	None Noted
SWMU 1&2 checks: (ruts, erosion, burrows, etc)	None Noted
Site mowing and growth check:	recently mowed
River AOI Inspection:	O/C
Product Storage Unit Inspection:	OC
Other comments:	

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 01, 2020

Phil Osborn
Aptim Environmental & Infrastructure
2872 N Ridge Rd, Suite 102B
Wichita, KS 67205

Work Order: **HS19120828**

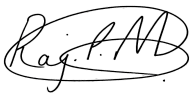
Laboratory Results for: **William FAR Surface Water**

Dear Phil,

ALS Environmental received 4 sample(s) on Dec 13, 2019 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: RJ.MODASHIA

RJ Modashia
Project Manager

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Work Order: HS19120828

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120828-01	Former Seep 7	Water		12-Dec-2019 14:15	13-Dec-2019 09:00	☐
HS19120828-02	Former Seep 8	Water		12-Dec-2019 14:30	13-Dec-2019 09:00	☐
HS19120828-03	Up Stream	Water		12-Dec-2019 14:45	13-Dec-2019 09:00	☐
HS19120828-04	Trip Blank	Water	022719-29	12-Dec-2019 00:00	13-Dec-2019 09:00	☐

Revision:2

Client: Aptim Environmental & Infrastructure **CASE NARRATIVE**
Project: William FAR Surface Water
Work Order: HS19120828

Work Order Comments

- Revised to add Pentachlorophenol
- Revised to update the SVOC compound list.

GCMS Semivolatiles by Method SW8270

Batch ID: 148943

Sample ID: LCS-148943

- Sample was spiked at 2X the normal concentration for Atrazine and Hexachlorocyclopentadiene, however calculations were adjusted accordingly and the recoveries were within control limits.

Sample ID: LCSD-148943

- Sample was spiked at 2X the normal concentration for Atrazine and Hexachlorocyclopentadiene, however calculations were adjusted accordingly and the recoveries were within control limits.

GCMS Volatiles by Method SW8260

Batch ID: R353295

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method M2340 B

Batch ID: R353499

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW7470

Batch ID: 148818

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 148790

Sample ID: Former Seep 7 (HS19120828-01MS)

- Barium failed for MS/MSD but passed for PDS.

Batch ID: 149118

Sample ID: HS19120994-01MS

- MS/MSD and DUPs are for an unrelated sample

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Former Seep 7
Collection Date: 12-Dec-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
1,1,1-Trichloroethane		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
1,1-Dichloroethane		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
1,1-Dichloroethene		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
Acetone		U	0.0020	0.0020	mg/L	1	26-Dec-2019 03:18
Benzene		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
Carbon disulfide		U	0.00060	0.0020	mg/L	1	26-Dec-2019 03:18
Chlorobenzene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 03:18
Ethylbenzene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 03:18
m,p-Xylene		U	0.00050	0.0020	mg/L	1	26-Dec-2019 03:18
Methyl tert-butyl ether		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
Methylene chloride		U	0.0010	0.0020	mg/L	1	26-Dec-2019 03:18
o-Xylene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 03:18
Tetrachloroethene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 03:18
Toluene		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
Vinyl chloride		U	0.00020	0.0010	mg/L	1	26-Dec-2019 03:18
Xylenes, Total		U	0.00030	0.0010	mg/L	1	26-Dec-2019 03:18
Surr: 1,2-Dichloroethane-d4	*106*			*70-126*	*%REC*	*1*	*26-Dec-2019 03:18*
Surr: 4-Bromofluorobenzene	*99.1*			*81-113*	*%REC*	*1*	*26-Dec-2019 03:18*
Surr: Dibromofluoromethane	*105*			*77-123*	*%REC*	*1*	*26-Dec-2019 03:18*
Surr: Toluene-d8	*102*			*82-127*	*%REC*	*1*	*26-Dec-2019 03:18*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3510 / 19-Dec-2019		Analyst: GEY
2-Methylnaphthalene		U	0.019	0.10	ug/L	1	21-Dec-2019 13:25
Benzoic acid	**0.48**		**0.022**	**0.20**	**ug/L**	1	21-Dec-2019 13:25
Bis(2-ethylhexyl)phthalate		U	0.037	0.20	ug/L	1	21-Dec-2019 13:25
Chrysene		U	0.021	0.10	ug/L	1	21-Dec-2019 13:25
Naphthalene		U	0.020	0.10	ug/L	1	21-Dec-2019 13:25
Pentachlorophenol		U	0.079	0.20	ug/L	1	21-Dec-2019 13:25
Phenanthrene		U	0.021	0.10	ug/L	1	21-Dec-2019 13:25
Pyrene		U	0.019	0.10	ug/L	1	21-Dec-2019 13:25
Surr: 2,4,6-Tribromophenol	*79.3*			*34-129*	*%REC*	*1*	*21-Dec-2019 13:25*
Surr: 2-Fluorobiphenyl	*89.6*			*40-125*	*%REC*	*1*	*21-Dec-2019 13:25*
Surr: 2-Fluorophenol	*82.2*			*20-120*	*%REC*	*1*	*21-Dec-2019 13:25*
Surr: 4-Terphenyl-d14	*96.1*			*40-135*	*%REC*	*1*	*21-Dec-2019 13:25*
Surr: Nitrobenzene-d5	*88.7*			*41-120*	*%REC*	*1*	*21-Dec-2019 13:25*
Surr: Phenol-d6	*90.9*			*20-120*	*%REC*	*1*	*21-Dec-2019 13:25*
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**273**		**2.00**	**2.00**	**mg/L**	1	30-Dec-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Former Seep 7
Collection Date: 12-Dec-2019 14:15

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 26-Dec-2019		Analyst: JHD
Arsenic	**0.00184**	J	**0.000400**	**0.00200**	**mg/L**	1	27-Dec-2019 01:25
Barium	**0.138**		**0.00190**	**0.00400**	**mg/L**	1	27-Dec-2019 01:25
Cadmium	U		0.000200	0.00200	mg/L	1	27-Dec-2019 01:25
Calcium	**85.3**		**0.0340**	**0.500**	**mg/L**	1	27-Dec-2019 01:25
Chromium	U		0.000400	0.00400	mg/L	1	27-Dec-2019 01:25
Lead	U		0.000600	0.00200	mg/L	1	27-Dec-2019 01:25
Magnesium	**14.5**		**0.0100**	**0.200**	**mg/L**	1	27-Dec-2019 01:25
Selenium	**0.00330**		**0.00110**	**0.00200**	**mg/L**	1	27-Dec-2019 01:25
Silver	U		0.000200	0.00200	mg/L	1	27-Dec-2019 01:25
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 17-Dec-2019		Analyst: JHD
Arsenic	**1.36**	J	**0.400**	**2.00**	**ug/L**	1	18-Dec-2019 23:02
Barium	**140**		**1.90**	**4.00**	**ug/L**	1	18-Dec-2019 23:02
Cadmium	U		0.200	2.00	ug/L	1	18-Dec-2019 23:02
Chromium	U		0.400	4.00	ug/L	1	18-Dec-2019 23:02
Lead	U		0.600	2.00	ug/L	1	18-Dec-2019 23:02
Selenium	**3.79**		**1.10**	**2.00**	**ug/L**	1	18-Dec-2019 23:02
Silver	U		0.200	2.00	ug/L	1	18-Dec-2019 23:02
DISSOLVED MERCURY BY SW7470A	**Method:SW7470 (dissolved)**				Prep:SW7470 / 17-Dec-2019		Analyst: FO
Mercury	U		0.0300	0.200	ug/L	1	17-Dec-2019 17:36

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

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Former Seep 8
Collection Date: 12-Dec-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
Acetone	**0.0060**		**0.0020**	**0.0020**	**mg/L**	1	26-Dec-2019 04:32
Benzene	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
Carbon disulfide	U		0.00060	0.0020	mg/L	1	26-Dec-2019 04:32
Chlorobenzene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:32
Ethylbenzene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:32
m,p-Xylene	U		0.00050	0.0020	mg/L	1	26-Dec-2019 04:32
Methyl tert-butyl ether	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
Methylene chloride	U		0.0010	0.0020	mg/L	1	26-Dec-2019 04:32
o-Xylene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:32
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:32
Toluene	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
Vinyl chloride	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:32
Xylenes, Total	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:32
Surr: 1,2-Dichloroethane-d4	*106*			*70-126*	*%REC*	*1*	*26-Dec-2019 04:32*
Surr: 4-Bromofluorobenzene	*102*			*81-113*	*%REC*	*1*	*26-Dec-2019 04:32*
Surr: Dibromofluoromethane	*108*			*77-123*	*%REC*	*1*	*26-Dec-2019 04:32*
Surr: Toluene-d8	*101*			*82-127*	*%REC*	*1*	*26-Dec-2019 04:32*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3510 / 19-Dec-2019		Analyst: GEY
2-Methylnaphthalene	U		0.019	0.10	ug/L	1	21-Dec-2019 13:45
Benzoic acid	**0.43**		**0.022**	**0.20**	**ug/L**	1	21-Dec-2019 13:45
Bis(2-ethylhexyl)phthalate	U		0.037	0.20	ug/L	1	21-Dec-2019 13:45
Chrysene	U		0.021	0.10	ug/L	1	21-Dec-2019 13:45
Naphthalene	**0.25**		**0.020**	**0.10**	**ug/L**	1	21-Dec-2019 13:45
Pentachlorophenol	U		0.079	0.20	ug/L	1	21-Dec-2019 13:45
Phenanthrene	U		0.021	0.10	ug/L	1	21-Dec-2019 13:45
Pyrene	U		0.019	0.10	ug/L	1	21-Dec-2019 13:45
Surr: 2,4,6-Tribromophenol	*79.0*			*34-129*	*%REC*	*1*	*21-Dec-2019 13:45*
Surr: 2-Fluorobiphenyl	*93.1*			*40-125*	*%REC*	*1*	*21-Dec-2019 13:45*
Surr: 2-Fluorophenol	*82.9*			*20-120*	*%REC*	*1*	*21-Dec-2019 13:45*
Surr: 4-Terphenyl-d14	*98.2*			*40-135*	*%REC*	*1*	*21-Dec-2019 13:45*
Surr: Nitrobenzene-d5	*92.2*			*41-120*	*%REC*	*1*	*21-Dec-2019 13:45*
Surr: Phenol-d6	*88.2*			*20-120*	*%REC*	*1*	*21-Dec-2019 13:45*
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**256**		**2.00**	**2.00**	**mg/L**	1	30-Dec-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Former Seep 8
Collection Date: 12-Dec-2019 14:30

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 26-Dec-2019		Analyst: JHD
Arsenic	**0.00186**	J	**0.000400**	**0.00200**	**mg/L**	1	27-Dec-2019 01:27
Barium	**0.132**		**0.00190**	**0.00400**	**mg/L**	1	27-Dec-2019 01:27
Cadmium	U		0.000200	0.00200	mg/L	1	27-Dec-2019 01:27
Calcium	**80.1**		**0.0340**	**0.500**	**mg/L**	1	27-Dec-2019 01:27
Chromium	U		0.000400	0.00400	mg/L	1	27-Dec-2019 01:27
Lead	U		0.000600	0.00200	mg/L	1	27-Dec-2019 01:27
Magnesium	**13.6**		**0.0100**	**0.200**	**mg/L**	1	27-Dec-2019 01:27
Selenium	**0.00280**		**0.00110**	**0.00200**	**mg/L**	1	27-Dec-2019 01:27
Silver	U		0.000200	0.00200	mg/L	1	27-Dec-2019 01:27
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 17-Dec-2019		Analyst: JHD
Arsenic	**1.52**	J	**0.400**	**2.00**	**ug/L**	1	18-Dec-2019 23:17
Barium	**136**		**1.90**	**4.00**	**ug/L**	1	18-Dec-2019 23:17
Cadmium	U		0.200	2.00	ug/L	1	18-Dec-2019 23:17
Chromium	U		0.400	4.00	ug/L	1	18-Dec-2019 23:17
Lead	U		0.600	2.00	ug/L	1	18-Dec-2019 23:17
Selenium	**2.99**		**1.10**	**2.00**	**ug/L**	1	18-Dec-2019 23:17
Silver	U		0.200	2.00	ug/L	1	18-Dec-2019 23:17
DISSOLVED MERCURY BY SW7470A	**Method:SW7470 (dissolved)**				Prep:SW7470 / 17-Dec-2019		Analyst: FO
Mercury	U		0.0300	0.200	ug/L	1	17-Dec-2019 17:38

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Up Stream
Collection Date: 12-Dec-2019 14:45

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
1,1,1-Trichloroethane	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
1,1-Dichloroethane	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
1,1-Dichloroethene	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
Acetone	U		0.0020	0.0020	mg/L	1	26-Dec-2019 04:57
Benzene	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
Carbon disulfide	U		0.00060	0.0020	mg/L	1	26-Dec-2019 04:57
Chlorobenzene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:57
Ethylbenzene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:57
m,p-Xylene	U		0.00050	0.0020	mg/L	1	26-Dec-2019 04:57
Methyl tert-butyl ether	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
Methylene chloride	U		0.0010	0.0020	mg/L	1	26-Dec-2019 04:57
o-Xylene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:57
Tetrachloroethene	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:57
Toluene	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
Vinyl chloride	U		0.00020	0.0010	mg/L	1	26-Dec-2019 04:57
Xylenes, Total	U		0.00030	0.0010	mg/L	1	26-Dec-2019 04:57
Surr: 1,2-Dichloroethane-d4	*104*			*70-126*	*%REC*	*1*	*26-Dec-2019 04:57*
Surr: 4-Bromofluorobenzene	*98.6*			*81-113*	*%REC*	*1*	*26-Dec-2019 04:57*
Surr: Dibromofluoromethane	*106*			*77-123*	*%REC*	*1*	*26-Dec-2019 04:57*
Surr: Toluene-d8	*102*			*82-127*	*%REC*	*1*	*26-Dec-2019 04:57*
LOW-LEVEL SEMIVOLATILES BY 8270D		**Method:SW8270**			Prep:SW3510 / 19-Dec-2019		Analyst: GEY
2-Methylnaphthalene	U		0.019	0.10	ug/L	1	21-Dec-2019 14:04
Benzoic acid	**0.43**		**0.022**	**0.20**	**ug/L**	1	21-Dec-2019 14:04
Bis(2-ethylhexyl)phthalate	U		0.037	0.20	ug/L	1	21-Dec-2019 14:04
Chrysene	U		0.021	0.10	ug/L	1	21-Dec-2019 14:04
Naphthalene	**0.19**		**0.020**	**0.10**	**ug/L**	1	21-Dec-2019 14:04
Pentachlorophenol	U		0.079	0.20	ug/L	1	21-Dec-2019 14:04
Phenanthrene	U		0.021	0.10	ug/L	1	21-Dec-2019 14:04
Pyrene	U		0.019	0.10	ug/L	1	21-Dec-2019 14:04
Surr: 2,4,6-Tribromophenol	*79.1*			*34-129*	*%REC*	*1*	*21-Dec-2019 14:04*
Surr: 2-Fluorobiphenyl	*96.3*			*40-125*	*%REC*	*1*	*21-Dec-2019 14:04*
Surr: 2-Fluorophenol	*83.1*			*20-120*	*%REC*	*1*	*21-Dec-2019 14:04*
Surr: 4-Terphenyl-d14	*97.5*			*40-135*	*%REC*	*1*	*21-Dec-2019 14:04*
Surr: Nitrobenzene-d5	*93.1*			*41-120*	*%REC*	*1*	*21-Dec-2019 14:04*
Surr: Phenol-d6	*90.1*			*20-120*	*%REC*	*1*	*21-Dec-2019 14:04*
HARDNESS, TOTAL AS CACO3 BY SM2340B		**Method:M2340 B**					Analyst: JHD
Hardness (As CaCO3)	**260**		**2.00**	**2.00**	**mg/L**	1	30-Dec-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Up Stream
Collection Date: 12-Dec-2019 14:45

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A	**Method:SW6020**				Prep:SW3010A / 26-Dec-2019		Analyst: JHD
Arsenic	**0.00142**	J	**0.000400**	**0.00200**	**mg/L**	1	27-Dec-2019 01:29
Barium	**0.132**		**0.00190**	**0.00400**	**mg/L**	1	27-Dec-2019 01:29
Cadmium	U		0.000200	0.00200	mg/L	1	27-Dec-2019 01:29
Calcium	**81.0**		**0.0340**	**0.500**	**mg/L**	1	27-Dec-2019 01:29
Chromium	U		0.000400	0.00400	mg/L	1	27-Dec-2019 01:29
Lead	U		0.000600	0.00200	mg/L	1	27-Dec-2019 01:29
Magnesium	**14.0**		**0.0100**	**0.200**	**mg/L**	1	27-Dec-2019 01:29
Selenium	**0.00305**		**0.00110**	**0.00200**	**mg/L**	1	27-Dec-2019 01:29
Silver	U		0.000200	0.00200	mg/L	1	27-Dec-2019 01:29
DISSOLVED METALS BY SW6020A	**Method:SW6020 (dissolved)**				Prep:SW3010A / 17-Dec-2019		Analyst: JHD
Arsenic	**1.58**	J	**0.400**	**2.00**	**ug/L**	1	18-Dec-2019 23:20
Barium	**156**		**1.90**	**4.00**	**ug/L**	1	18-Dec-2019 23:20
Cadmium	U		0.200	2.00	ug/L	1	18-Dec-2019 23:20
Chromium	U		0.400	4.00	ug/L	1	18-Dec-2019 23:20
Lead	U		0.600	2.00	ug/L	1	18-Dec-2019 23:20
Selenium	**3.97**		**1.10**	**2.00**	**ug/L**	1	18-Dec-2019 23:20
Silver	U		0.200	2.00	ug/L	1	18-Dec-2019 23:20
DISSOLVED MERCURY BY SW7470A	**Method:SW7470 (dissolved)**				Prep:SW7470 / 17-Dec-2019		Analyst: FO
Mercury	U		0.0300	0.200	ug/L	1	17-Dec-2019 17:40

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
Sample ID: Trip Blank
Collection Date: 12-Dec-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19120828
Lab ID:HS19120828-04
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
1,1,1-Trichloroethane		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
1,1-Dichloroethane		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
1,1-Dichloroethene		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
Acetone		U	0.0020	0.0020	mg/L	1	26-Dec-2019 02:53
Benzene		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
Carbon disulfide		U	0.00060	0.0020	mg/L	1	26-Dec-2019 02:53
Chlorobenzene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 02:53
Ethylbenzene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 02:53
m,p-Xylene		U	0.00050	0.0020	mg/L	1	26-Dec-2019 02:53
Methyl tert-butyl ether		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
Methylene chloride		U	0.0010	0.0020	mg/L	1	26-Dec-2019 02:53
o-Xylene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 02:53
Tetrachloroethene		U	0.00030	0.0010	mg/L	1	26-Dec-2019 02:53
Toluene		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
Vinyl chloride		U	0.00020	0.0010	mg/L	1	26-Dec-2019 02:53
Xylenes, Total		U	0.00030	0.0010	mg/L	1	26-Dec-2019 02:53
Surr: 1,2-Dichloroethane-d4	*103*			*70-126*	*%REC*	*1*	*26-Dec-2019 02:53*
Surr: 4-Bromofluorobenzene	*96.7*			*81-113*	*%REC*	*1*	*26-Dec-2019 02:53*
Surr: Dibromofluoromethane	*105*			*77-123*	*%REC*	*1*	*26-Dec-2019 02:53*
Surr: Toluene-d8	*99.6*			*82-127*	*%REC*	*1*	*26-Dec-2019 02:53*

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

Revision: 2

Weight / Prep Log

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

Batch ID: 148790 **Start Date:** 17 Dec 2019 11:00 **End Date:** 17 Dec 2019 15:00
Method: DISS METALS PREP - WATER - SW3010A **Prep Code:** 3010A DISS

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120828-01		10 (mL)	10 (mL)	1
HS19120828-02		10 (mL)	10 (mL)	1
HS19120828-03		10 (mL)	10 (mL)	1

Batch ID: 148818 **Start Date:** 17 Dec 2019 12:00 **End Date:** 17 Dec 2019 14:00
Method: MERCURY PREP BY 7470A - DISSOLVED **Prep Code:** HG_W_DISSPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120828-01		10 (mL)	10 (mL)	1
HS19120828-02		10 (mL)	10 (mL)	1
HS19120828-03		10 (mL)	10 (mL)	1

Batch ID: 148943 **Start Date:** 19 Dec 2019 08:00 **End Date:** 19 Dec 2019 17:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_LOW

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120828-01	1	1000 (mL)	1 (mL)	0.001
HS19120828-02	1	1000 (mL)	1 (mL)	0.001
HS19120828-03	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149118 **Start Date:** 26 Dec 2019 10:00 **End Date:** 26 Dec 2019 14:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120828-01		10 (mL)	10 (mL)	1
HS19120828-02		10 (mL)	10 (mL)	1
HS19120828-03		10 (mL)	10 (mL)	1

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148790 (0)	**Test Name :** DISSOLVED METALS BY SW6020A				**Matrix:** Water	
HS19120828-01	Former Seep 7	12 Dec 2019 14:15		17 Dec 2019 15:00	18 Dec 2019 23:02	1
HS19120828-02	Former Seep 8	12 Dec 2019 14:30		17 Dec 2019 15:00	18 Dec 2019 23:17	1
HS19120828-03	Up Stream	12 Dec 2019 14:45		17 Dec 2019 15:00	18 Dec 2019 23:20	1
Batch ID: 148818 (0)	**Test Name :** DISSOLVED MERCURY BY SW7470A				**Matrix:** Water	
HS19120828-01	Former Seep 7	12 Dec 2019 14:15		17 Dec 2019 12:00	17 Dec 2019 17:36	1
HS19120828-02	Former Seep 8	12 Dec 2019 14:30		17 Dec 2019 12:00	17 Dec 2019 17:38	1
HS19120828-03	Up Stream	12 Dec 2019 14:45		17 Dec 2019 12:00	17 Dec 2019 17:40	1
Batch ID: 148943 (0)	**Test Name :** LOW-LEVEL SEMIVOLATILES BY 8270D				**Matrix:** Water	
HS19120828-01	Former Seep 7	12 Dec 2019 14:15		19 Dec 2019 19:09	21 Dec 2019 13:25	1
HS19120828-02	Former Seep 8	12 Dec 2019 14:30		19 Dec 2019 19:09	21 Dec 2019 13:45	1
HS19120828-03	Up Stream	12 Dec 2019 14:45		19 Dec 2019 19:09	21 Dec 2019 14:04	1
Batch ID: 149118 (0)	**Test Name :** ICP-MS METALS BY SW6020A				**Matrix:** Water	
HS19120828-01	Former Seep 7	12 Dec 2019 14:15		26 Dec 2019 14:00	27 Dec 2019 01:25	1
HS19120828-02	Former Seep 8	12 Dec 2019 14:30		26 Dec 2019 14:00	27 Dec 2019 01:27	1
HS19120828-03	Up Stream	12 Dec 2019 14:45		26 Dec 2019 14:00	27 Dec 2019 01:29	1
Batch ID: R353295 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS19120828-01	Former Seep 7	12 Dec 2019 14:15			26 Dec 2019 03:18	1
HS19120828-02	Former Seep 8	12 Dec 2019 14:30			26 Dec 2019 04:32	1
HS19120828-03	Up Stream	12 Dec 2019 14:45			26 Dec 2019 04:57	1
HS19120828-04	Trip Blank	12 Dec 2019 00:00			26 Dec 2019 02:53	1
Batch ID: R353499 (0)	**Test Name :** HARDNESS, TOTAL AS CACO3 BY SM2340B				**Matrix:** Water	
HS19120828-01	Former Seep 7	12 Dec 2019 14:15			30 Dec 2019 12:47	1
HS19120828-02	Former Seep 8	12 Dec 2019 14:30			30 Dec 2019 12:47	1
HS19120828-03	Up Stream	12 Dec 2019 14:45			30 Dec 2019 12:47	1

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 148790 (0) **Instrument: ICPMS05** **Method: DISSOLVED METALS BY SW6020A (DISSOLVED)**

MBLK Sample ID: **MBLKF1-148790** Units: **mg/L** Analysis Date: **18-Dec-2019 22:57**
Client ID: Run ID: **ICPMS05_352780** SeqNo: **5398880** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Barium	U	0.00400								
Cadmium	U	0.00200								
Chromium	U	0.00400								
Lead	U	0.00200								
Selenium	U	0.00200								
Silver	U	0.00200								

MBLK Sample ID: **MBLK-148790** Units: **mg/L** Analysis Date: **18-Dec-2019 22:55**
Client ID: Run ID: **ICPMS05_352780** SeqNo: **5398879** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Barium	U	0.00400								
Cadmium	U	0.00200								
Chromium	U	0.00400								
Lead	U	0.00200								
Selenium	U	0.00200								
Silver	U	0.00200								

LCS Sample ID: **LCS-148790** Units: **mg/L** Analysis Date: **18-Dec-2019 23:00**
Client ID: Run ID: **ICPMS05_352780** SeqNo: **5398881** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.04659	0.00200	0.05	0	93.2	80 - 120				
Barium	0.04751	0.00400	0.05	0	95.0	80 - 120				
Cadmium	0.04864	0.00200	0.05	0	97.3	80 - 120				
Chromium	0.04416	0.00400	0.05	0	88.3	80 - 120				
Lead	0.04499	0.00200	0.05	0	90.0	80 - 120				
Selenium	0.04728	0.00200	0.05	0	94.6	80 - 120				
Silver	0.05585	0.00200	0.05	0	112	80 - 120				

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 148790 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

MS Sample ID: **HS19120828-01MS** Units: **mg/L** Analysis Date: **18-Dec-2019 23:06**
Client ID: **Former Seep 7** Run ID: **ICPMS05_352780** SeqNo: **5398884** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.0516	0.00200	0.05	0.001361	100	75 - 125				
Barium	0.2045	0.00400	0.05	0.1405	128	75 - 125				S
Cadmium	0.04974	0.00200	0.05	0.000043	99.4	75 - 125				
Chromium	0.04594	0.00400	0.05	-0.000081	92.0	75 - 125				
Lead	0.04708	0.00200	0.05	0.000065	94.0	75 - 125				
Selenium	0.05222	0.00200	0.05	0.003789	96.9	75 - 125				
Silver	0.05664	0.00200	0.05	0.000029	113	75 - 125				

MSD Sample ID: **HS19120828-01MSD** Units: **mg/L** Analysis Date: **18-Dec-2019 23:08**
Client ID: **Former Seep 7** Run ID: **ICPMS05_352780** SeqNo: **5398885** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05276	0.00200	0.05	0.001361	103	75 - 125	0.0516	2.22	20	
Barium	0.2044	0.00400	0.05	0.1405	128	75 - 125	0.2045	0.0411	20	S
Cadmium	0.05078	0.00200	0.05	0.000043	101	75 - 125	0.04974	2.06	20	
Chromium	0.04687	0.00400	0.05	-0.000081	93.9	75 - 125	0.04594	2	20	
Lead	0.04949	0.00200	0.05	0.000065	98.8	75 - 125	0.04708	4.97	20	
Selenium	0.05813	0.00200	0.05	0.003789	109	75 - 125	0.05222	10.7	20	
Silver	0.05752	0.00200	0.05	0.000029	115	75 - 125	0.05664	1.54	20	

PDS Sample ID: **HS19120828-01PDS** Units: **mg/L** Analysis Date: **18-Dec-2019 23:11**
Client ID: **Former Seep 7** Run ID: **ICPMS05_352780** SeqNo: **5398886** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1072	0.00200	0.1	0.001361	106	75 - 125				
Barium	0.2569	0.00400	0.1	0.1405	116	75 - 125				
Cadmium	0.1055	0.00200	0.1	0.000043	105	75 - 125				
Chromium	0.09918	0.00400	0.1	-0.000081	99.3	75 - 125				
Lead	0.1004	0.00200	0.1	0.000065	100	75 - 125				
Selenium	0.1092	0.00200	0.1	0.003789	105	75 - 125				
Silver	0.1035	0.00200	0.1	0.000029	103	75 - 125				

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 148790 (0) **Instrument:** ICPMS05 **Method:** DISSOLVED METALS BY SW6020A (DISSOLVED)

SD Sample ID: **HS19120828-01SD** Units: **mg/L** Analysis Date: **18-Dec-2019 23:04**
Client ID: **Former Seep 7** Run ID: **ICPMS05_352780** SeqNo: **5398883** PrepDate: **17-Dec-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	U	0.0100					0.001361	0	10	
Barium	0.1403	0.0200					0.1405	0.108	10	
Cadmium	U	0.0100					0.000043	0	10	
Chromium	U	0.0200					-0.000081	0	10	
Lead	U	0.0100					0.000065	0	10	
Selenium	U	0.0100					0.003789	0	10	
Silver	U	0.0100					0.000029	0	10	

The following samples were analyzed in this batch: HS19120828-01 HS19120828-02 HS19120828-03

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 148818 (0) **Instrument:** HG03 **Method:** DISSOLVED MERCURY BY SW7470A (DISSOLVED)

MBLK Sample ID: **MBLK-148818** Units: **mg/L** Analysis Date: **17-Dec-2019 17:23**
Client ID: Run ID: **HG03_352746** SeqNo: **5396194** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.000200								

LCS Sample ID: **LCS-148818** Units: **mg/L** Analysis Date: **17-Dec-2019 17:24**
Client ID: Run ID: **HG03_352746** SeqNo: **5396195** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00516	0.000200	0.005	0	103	80 - 120				

MS Sample ID: **HS19120566-07MS** Units: **mg/L** Analysis Date: **17-Dec-2019 17:28**
Client ID: Run ID: **HG03_352746** SeqNo: **5396197** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0052	0.000200	0.005	-0.000007	104	80 - 120				

MSD Sample ID: **HS19120566-07MSD** Units: **mg/L** Analysis Date: **17-Dec-2019 17:29**
Client ID: Run ID: **HG03_352746** SeqNo: **5396198** PrepDate: **17-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00518	0.000200	0.005	-0.000007	104	80 - 120	0.0052	0.385	20	

The following samples were analyzed in this batch: HS19120828-01 HS19120828-02 HS19120828-03

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 149118 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-149118** Units: **mg/L** Analysis Date: **27-Dec-2019 00:25**
Client ID: Run ID: **ICPMS05_353286** SeqNo: **5411352** PrepDate: **26-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Barium	U	0.00400								
Cadmium	U	0.00200								
Calcium	0.2839	0.500								J
Chromium	U	0.00400								
Lead	U	0.00200								
Magnesium	0.02338	0.200								J
Selenium	U	0.00200								
Silver	U	0.00200								

LCS Sample ID: **LCS-149118** Units: **mg/L** Analysis Date: **27-Dec-2019 00:28**
Client ID: Run ID: **ICPMS05_353286** SeqNo: **5411353** PrepDate: **26-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05285	0.00200	0.05	0	106	80 - 120				
Barium	0.05085	0.00400	0.05	0	102	80 - 120				
Cadmium	0.05223	0.00200	0.05	0	104	80 - 120				
Calcium	5.377	0.500	5	0	108	80 - 120				
Chromium	0.05131	0.00400	0.05	0	103	80 - 120				
Lead	0.04698	0.00200	0.05	0	94.0	80 - 120				
Magnesium	5.39	0.200	5	0	108	80 - 120				
Selenium	0.04985	0.00200	0.05	0	99.7	80 - 120				
Silver	0.04811	0.00200	0.05	0	96.2	80 - 120				

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 149118 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19120994-01MS** Units: **mg/L** Analysis Date: **27-Dec-2019 00:34**
Client ID: Run ID: **ICPMS05_353286** SeqNo: **5411356** PrepDate: **26-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05754	0.00200	0.05	0.004737	106	80 - 120				
Barium	0.3063	0.00400	0.05	0.2063	200	80 - 120				SO
Cadmium	0.05117	0.00200	0.05	0.000153	102	80 - 120				
Calcium	88.47	0.500	5	68.73	395	80 - 120				SO
Chromium	0.05105	0.00400	0.05	0.000182	102	80 - 120				
Lead	0.04768	0.00200	0.05	0.000244	94.9	80 - 120				
Magnesium	10.25	0.200	5	4.131	122	80 - 120				S
Selenium	0.05085	0.00200	0.05	0.000548	101	80 - 120				
Silver	0.04685	0.00200	0.05	0.000009	93.7	80 - 120				

MSD Sample ID: **HS19120994-01MSD** Units: **mg/L** Analysis Date: **27-Dec-2019 00:37**
Client ID: Run ID: **ICPMS05_353286** SeqNo: **5411357** PrepDate: **26-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05801	0.00200	0.05	0.004737	107	80 - 120	0.05754	0.824	20	
Barium	0.3213	0.00400	0.05	0.2063	230	80 - 120	0.3063	4.78	20	SO
Cadmium	0.05132	0.00200	0.05	0.000153	102	80 - 120	0.05117	0.293	20	
Calcium	93.84	0.500	5	68.73	502	80 - 120	88.47	5.89	20	SO
Chromium	0.05052	0.00400	0.05	0.000182	101	80 - 120	0.05105	1.04	20	
Lead	0.04964	0.00200	0.05	0.000244	98.8	80 - 120	0.04768	4.03	20	
Magnesium	10.33	0.200	5	4.131	124	80 - 120	10.25	0.757	20	S
Selenium	0.05114	0.00200	0.05	0.000548	101	80 - 120	0.05085	0.586	20	
Silver	0.04621	0.00200	0.05	0.000009	92.4	80 - 120	0.04685	1.38	20	

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 149118 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19120994-01PDS** Units: **mg/L** Analysis Date: **27-Dec-2019 00:39**
Client ID: Run ID: **ICPMS05_353286** SeqNo: **5411358** PrepDate: **26-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1001	0.00200	0.1	0.004737	95.4	75 - 125				
Barium	0.2979	0.00400	0.1	0.2063	91.6	75 - 125				
Cadmium	0.08679	0.00200	0.1	0.000153	86.6	75 - 125				
Calcium	82.42	0.500	10	68.73	137	75 - 125				SO
Chromium	0.0915	0.00400	0.1	0.000182	91.3	75 - 125				
Lead	0.08892	0.00200	0.1	0.000244	88.7	75 - 125				
Magnesium	13.48	0.200	10	4.131	93.5	75 - 125				
Selenium	0.09207	0.00200	0.1	0.000548	91.5	75 - 125				
Silver	0.08021	0.00200	0.1	0.000009	80.2	75 - 125				

SD Sample ID: **HS19120994-01SD** Units: **mg/L** Analysis Date: **27-Dec-2019 00:32**
Client ID: Run ID: **ICPMS05_353286** SeqNo: **5411355** PrepDate: **26-Dec-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.005015	0.0100					0.004737	0	10	J
Barium	0.2156	0.0200					0.2063	4.53	10	
Cadmium	U	0.0100					0.000153	0	10	
Calcium	67.3	2.50					68.73	2.09	10	
Chromium	U	0.0200					0.000182	0	10	
Lead	U	0.0100					0.000244	0	10	
Magnesium	4.087	1.00					4.131	1.08	10	
Selenium	U	0.0100					0.000548	0	10	
Silver	U	0.0100					0.000009	0	10	

The following samples were analyzed in this batch: HS19120828-01 HS19120828-02 HS19120828-03

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 148943 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

MBLK Sample ID: **MBLK-148943** Units: **ug/L** Analysis Date: **21-Dec-2019 12:27**
Client ID: Run ID: **SV-7_353079** SeqNo: **5405108** PrepDate: **19-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	U	0.10								
Benzoic acid	U	0.20								
Bis(2-ethylhexyl)phthalate	U	0.20								
Chrysene	U	0.10								
Naphthalene	U	0.10								
Pentachlorophenol	U	0.20								
Phenanthrene	U	0.10								
Pyrene	U	0.10								
Surr: 2,4,6-Tribromophenol	*4.094*	*0.20*	*5*	*0*	*81.9*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*4.864*	*0.20*	*5*	*0*	*97.3*	*40 - 125*				
Surr: 2-Fluorophenol	*4.509*	*0.20*	*5*	*0*	*90.2*	*20 - 120*				
Surr: 4-Terphenyl-d14	*5.04*	*0.20*	*5*	*0*	*101*	*40 - 135*				
Surr: Nitrobenzene-d5	*4.873*	*0.20*	*5*	*0*	*97.5*	*41 - 120*				
Surr: Phenol-d6	*4.71*	*0.20*	*5*	*0*	*94.2*	*20 - 120*				

LCS Sample ID: **LCS-148943** Units: **ug/L** Analysis Date: **21-Dec-2019 12:47**
Client ID: Run ID: **SV-7_353079** SeqNo: **5405413** PrepDate: **19-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2-Methylnaphthalene	4.585	0.10	5	0	91.7	50 - 120				
Benzoic acid	5.11	0.20	5	0	102	10 - 110				
Bis(2-ethylhexyl)phthalate	5.326	0.20	5	0	107	40 - 139				
Chrysene	4.735	0.10	5	0	94.7	43 - 120				
Naphthalene	4.69	0.10	5	0	93.8	45 - 120				
Pentachlorophenol	2.886	0.20	5	0	57.7	19 - 121				
Phenanthrene	4.698	0.10	5	0	94.0	45 - 121				
Pyrene	5.161	0.10	5	0	103	40 - 130				
Surr: 2,4,6-Tribromophenol	*4.37*	*0.20*	*5*	*0*	*87.4*	*34 - 129*				
Surr: 2-Fluorobiphenyl	*4.978*	*0.20*	*5*	*0*	*99.6*	*40 - 125*				
Surr: 2-Fluorophenol	*4.902*	*0.20*	*5*	*0*	*98.0*	*20 - 120*				
Surr: 4-Terphenyl-d14	*4.937*	*0.20*	*5*	*0*	*98.7*	*40 - 135*				
Surr: Nitrobenzene-d5	*4.961*	*0.20*	*5*	*0*	*99.2*	*41 - 120*				
Surr: Phenol-d6	*5.133*	*0.20*	*5*	*0*	*103*	*20 - 120*				

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: 148943 (0) **Instrument: SV-7** **Method: LOW-LEVEL SEMIVOLATILES BY 8270D**

LCSD Sample ID: **LCSD-148943** Units: **ug/L** Analysis Date: **21-Dec-2019 13:06**
Client ID: Run ID: **SV-7_353079** SeqNo: **5405414** PrepDate: **19-Dec-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
2-Methylnaphthalene	4.674	0.10	5	0	93.5	50 - 120	4.585	1.92	20	
Benzoic acid	5.11	0.20	5	0	102	10 - 110	5.11	0.0117	20	
Bis(2-ethylhexyl)phthalate	5.447	0.20	5	0	109	40 - 139	5.326	2.24	20	
Chrysene	4.888	0.10	5	0	97.8	43 - 120	4.735	3.18	20	
Naphthalene	4.771	0.10	5	0	95.4	45 - 120	4.69	1.71	20	
Pentachlorophenol	3.049	0.20	5	0	61.0	19 - 121	2.886	5.47	20	
Phenanthrene	4.571	0.10	5	0	91.4	45 - 121	4.698	2.74	20	
Pyrene	5.195	0.10	5	0	104	40 - 130	5.161	0.67	20	
Surr: 2,4,6-Tribromophenol	*4.436*	*0.20*	*5*	*0*	*88.7*	*34 - 129*	*4.37*	*1.5*	*20*	
Surr: 2-Fluorobiphenyl	*5.098*	*0.20*	*5*	*0*	*102*	*40 - 125*	*4.978*	*2.38*	*20*	
Surr: 2-Fluorophenol	*4.865*	*0.20*	*5*	*0*	*97.3*	*20 - 120*	*4.902*	*0.762*	*20*	
Surr: 4-Terphenyl-d14	*5.066*	*0.20*	*5*	*0*	*101*	*40 - 135*	*4.937*	*2.57*	*20*	
Surr: Nitrobenzene-d5	*5.164*	*0.20*	*5*	*0*	*103*	*41 - 120*	*4.961*	*4.01*	*20*	
Surr: Phenol-d6	*5.022*	*0.20*	*5*	*0*	*100*	*20 - 120*	*5.133*	*2.19*	*20*	

The following samples were analyzed in this batch: HS19120828-01 HS19120828-02 HS19120828-03

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: R353295 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-191225** Units: **ug/L** Analysis Date: **26-Dec-2019 02:04**
Client ID: Run ID: **VOA4_353295** SeqNo: **5409491** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
Acetone	U	2.0								
Benzene	U	1.0								
Carbon disulfide	U	2.0								
Chlorobenzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
Methyl tert-butyl ether	U	1.0								
Methylene chloride	U	2.0								
o-Xylene	U	1.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
Vinyl chloride	U	1.0								
Xylenes, Total	U	1.0								
Surr: 1,2-Dichloroethane-d4	*54.35*	*1.0*	*50*	*0*	*109*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*47.04*	*1.0*	*50*	*0*	*94.1*	*82 - 115*				
Surr: Dibromofluoromethane	*51.91*	*1.0*	*50*	*0*	*104*	*73 - 126*				
Surr: Toluene-d8	*50.51*	*1.0*	*50*	*0*	*101*	*81 - 120*				

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: R353295 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

LCS Sample ID: **VLCSW-191225** Units: **ug/L** Analysis Date: **26-Dec-2019 01:14**
Client ID: Run ID: **VOA4_353295** SeqNo: **5409490** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.34	1.0	20	0	107	70 - 130				
1,1-Dichloroethane	17.62	1.0	20	0	88.1	71 - 122				
1,1-Dichloroethene	16.94	1.0	20	0	84.7	70 - 130				
Acetone	41	2.0	40	0	102	70 - 130				
Benzene	20.22	1.0	20	0	101	74 - 120				
Carbon disulfide	35.09	2.0	40	0	87.7	70 - 130				
Chlorobenzene	18.98	1.0	20	0	94.9	76 - 113				
Ethylbenzene	20.91	1.0	20	0	105	77 - 117				
m,p-Xylene	43.53	2.0	40	0	109	77 - 122				
Methyl tert-butyl ether	18.03	1.0	20	0	90.1	70 - 130				
Methylene chloride	16.63	2.0	20	0	83.2	70 - 127				
o-Xylene	21.11	1.0	20	0	106	75 - 119				
Tetrachloroethene	18.45	1.0	20	0	92.2	76 - 119				
Toluene	20.24	1.0	20	0	101	77 - 118				
Vinyl chloride	19.06	1.0	20	0	95.3	70 - 130				
Xylenes, Total	64.65	1.0	60	0	108	75 - 122				
Surr: 1,2-Dichloroethane-d4	*48.73*	*1.0*	*50*	*0*	*97.5*	*70 - 130*				
Surr: 4-Bromofluorobenzene	*49.08*	*1.0*	*50*	*0*	*98.2*	*82 - 115*				
Surr: Dibromofluoromethane	*50.73*	*1.0*	*50*	*0*	*101*	*73 - 126*				
Surr: Toluene-d8	*50.92*	*1.0*	*50*	*0*	*102*	*81 - 120*				

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: R353295 (0) **Instrument:** VOA4 **Method:** LOW LEVEL VOLATILES BY SW8260C

MS Sample ID: **HS19120828-01MS** Units: **ug/L** Analysis Date: **26-Dec-2019 03:43**
Client ID: **Former Seep 7** Run ID: **VOA4_353295** SeqNo: **5409495** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.94	1.0	20	0	110	70 - 130				
1,1-Dichloroethane	19.12	1.0	20	0	95.6	70 - 127				
1,1-Dichloroethene	19.77	1.0	20	0	98.9	70 - 130				
Acetone	47.32	2.0	40	0	118	70 - 130				
Benzene	18.83	1.0	20	0	94.2	70 - 127				
Carbon disulfide	43.91	2.0	40	0	110	70 - 130				
Chlorobenzene	18.2	1.0	20	0	91.0	70 - 114				
Ethylbenzene	20.88	1.0	20	0	104	70 - 124				
m,p-Xylene	43.01	2.0	40	0	108	70 - 130				
Methyl tert-butyl ether	18.74	1.0	20	0	93.7	70 - 130				
Methylene chloride	19.36	2.0	20	0	96.8	70 - 128				
o-Xylene	20.45	1.0	20	0	102	70 - 124				
Tetrachloroethene	17.66	1.0	20	0	88.3	70 - 130				
Toluene	18.85	1.0	20	0	94.3	70 - 123				
Vinyl chloride	22.53	1.0	20	0	113	70 - 130				
Xylenes, Total	63.47	1.0	60	0	106	70 - 130				
Surr: 1,2-Dichloroethane-d4	*49.75*	*1.0*	*50*	*0*	*99.5*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*51.67*	*1.0*	*50*	*0*	*103*	*81 - 113*				
Surr: Dibromofluoromethane	*50.14*	*1.0*	*50*	*0*	*100*	*77 - 123*				
Surr: Toluene-d8	*49.37*	*1.0*	*50*	*0*	*98.7*	*82 - 127*				

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: HS19120828

QC BATCH REPORT

Batch ID: R353295 (0) **Instrument: VOA4** **Method: LOW LEVEL VOLATILES BY SW8260C**

MSD Sample ID: **HS19120828-01MSD** Units: **ug/L** Analysis Date: **26-Dec-2019 04:08**
Client ID: **Former Seep 7** Run ID: **VOA4_353295** SeqNo: **5409496** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1-Trichloroethane	20.32	1.0	20	0	102	70 - 130	21.94	7.67	20	
1,1-Dichloroethane	17.41	1.0	20	0	87.0	70 - 127	19.12	9.34	20	
1,1-Dichloroethene	16.69	1.0	20	0	83.4	70 - 130	19.77	16.9	20	
Acetone	42.98	2.0	40	0	107	70 - 130	47.32	9.6	20	
Benzene	18.28	1.0	20	0	91.4	70 - 127	18.83	2.98	20	
Carbon disulfide	36.14	2.0	40	0	90.4	70 - 130	43.91	19.4	20	
Chlorobenzene	17.19	1.0	20	0	86.0	70 - 114	18.2	5.67	20	
Ethylbenzene	19.96	1.0	20	0	99.8	70 - 124	20.88	4.51	20	
m,p-Xylene	39.96	2.0	40	0	99.9	70 - 130	43.01	7.36	20	
Methyl tert-butyl ether	17.53	1.0	20	0	87.7	70 - 130	18.74	6.67	20	
Methylene chloride	17.62	2.0	20	0	88.1	70 - 128	19.36	9.42	20	
o-Xylene	19.94	1.0	20	0	99.7	70 - 124	20.45	2.57	20	
Tetrachloroethene	17.53	1.0	20	0	87.6	70 - 130	17.66	0.768	20	
Toluene	18.98	1.0	20	0	94.9	70 - 123	18.85	0.687	20	
Vinyl chloride	19.94	1.0	20	0	99.7	70 - 130	22.53	12.2	20	
Xylenes, Total	59.9	1.0	60	0	99.8	70 - 130	63.47	5.79	20	
Surr: 1,2-Dichloroethane-d4	*50.99*	*1.0*	*50*	*0*	*102*	*70 - 126*	*49.75*	*2.44*	*20*	
Surr: 4-Bromofluorobenzene	*50.83*	*1.0*	*50*	*0*	*102*	*81 - 113*	*51.67*	*1.66*	*20*	
Surr: Dibromofluoromethane	*49.13*	*1.0*	*50*	*0*	*98.3*	*77 - 123*	*50.14*	*2.04*	*20*	
Surr: Toluene-d8	*50.63*	*1.0*	*50*	*0*	*101*	*82 - 127*	*49.37*	*2.53*	*20*	

The following samples were analyzed in this batch: HS19120828-01 HS19120828-02 HS19120828-03 HS19120828-04

Revision: 2

Client: Aptim Environmental & Infrastructure
Project: William FAR Surface Water
WorkOrder: **HS19120828**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231 V009	22-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2020	31-Dec-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	T104704231-19-25	30-Apr-2020

Sample Receipt Checklist

Client Name: CBI-Wichita
Work Order: HS19120828
Date/Time Received: **13-Dec-2019 09:00**
Received by: **JRM**

Checklist completed by: *Sonia West* eSignature 15-Dec-2019 Date
Reviewed by: *RJ Modashia* eSignature 16-Dec-2019 Date

Matrices: **Water**
Carrier name: **FedEx Standard Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:196370
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.2/1.2c	IR 11	
Cooler(s)/Kit(s):	44034		
Date/Time sample(s) sent to storage:	12/15/19 11:45		
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:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 196370

ALS Project Manager: | ALS Work Order #: HS19120828

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	William FAR Surface Water	A	8260_LL_W (VOC 8260 Select List)
Work Order		Project Number		B	8270_LOW_W (Willams FAR sel list)
Company Name	Aptim Environmental & Infrastruct	Bill To Company	Aptim Environmental and Infrastru	C	ICP_DISS (RCRA 8 Metals (Add Hg))
Send Report To	Phil Osborn	Invoice Attn	AP	D	ICP_TW (RCRA 8 Metals (Add Hg))
Address	2872 N Ridge Rd, Suite 102B	Address	7330 W 33rd St. North Suite 106	E	HARD (Add Ca and Mg)
				F	
City/State/Zip	Wichita, KS 67205	City/State/Zip	Wichita KS 67205	G	
Phone	(316) 220-8020	Phone		H	
Fax		Fax		I	
e-Mail Address	phil.osborn@aptim.com	e-Mail Address	accountspayable@aptim.com	J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Farmer Seep 7	12/12/19	1415	W	X	7	X	X	X	X	X						
2	Farmer Seep 8	"	1430	"	"	7	X	X	X	X	X						
3	Up stream	"	1445	"	"	7	X	X	X	X	X						
4	Trip Blank					2	X										
5																	
6																	
7																	
8																	
9																	
10																	

HS19120828
Aptim Environmental & Infrastructure
William FAR Surface Water

Sampler(s) Please Print & Sign: Phil Osborn

Shipment Method:

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other ____

Results Due Date:

Relinquished by: | Date: 12/12/19 | Time: 1700 | Received by: FedEx overnight

Relinquished by: | Date: 12/13/19 | Time: 09:00 | Received by (Laboratory): J. Jimmerson

Logged by (Laboratory): | Date: | Time: | Checked by (Laboratory):

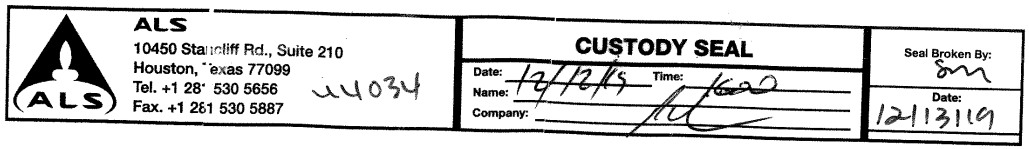
Notes: CBI William FAR

Cooler ID	Cooler Temp.
	UC
44034	1.2
	IR11
	CF06

QC Package: (Check One Box Below)
[ ] Level II Std QC
[X] Level II Std QC/Raw Data
[ ] Level IV SW846/CLP
[ ] Other ____
[ ] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.



44034 DEC 13 2019