December 12, 2017

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Subject: Letter Report for Groundwater Sampling at ARRC MP Hurricane Section, Alaska ADEC File # 2258.26.008

Mr. Grandel:

Restoration Science & Engineering, LLC (RSE) is providing the following letter report for groundwater sampling of four (4) monitoring wells located at the Alaska Railroad Corporation (ARRC) Hurricane Siding located at Milepost 284.2 near Hurricane Section (near Healy), Alaska. This site is listed under file 2258.26.008 in the Alaska Department of Environmental Conservation (ADEC) contaminated sites database.

SITE OVERVIEW

In 1990, two (2) underground storage tanks (USTs) were removed from the ARRC Hurricane Siding site. After the diesel UST removal, hydrocarbons remained in the southern end of the diesel UST excavation. In 2009, Clarus advanced additional borings to help delineate the extent and concentration of the hydrocarbons of the former diesel UST location.

In September 2011, RSE provided environmental oversight for the advancement of four (4) soil borings later completed as groundwater monitoring wells to define the horizontal and vertical extent of remaining petroleum hydrocarbon impacts. Laboratory soil samples analyzed for hydrocarbons confirmed subsurface soil conditions were below ADEC Method 2 Migration to Groundwater soil cleanup levels meeting the requirements in 18 AAC 75. A groundwater sample from monitoring well RSE-4 measured 1.52 mg/for diesel range organics (DRO), above the ADEC Table C DRO cleanup level of 1.5 mg/L. Monitoring well RSE-4 is downgradient of the former UST location.

Site remediation by excavation was completed in fall of 2015 by FES. Impacted soils around the former diesel UST location were excavated to the maximum extent possible by FES. Some impacted soils were left in place due to site conditions. Contaminated soil was temporarily stockpiled onsite and later transported to Anchorage for thermal treatment (Soil Removal Report, FES, January 13, 2016).

Multiple groundwater sampling events have occurred at the four (4) wells installed onsite since 2011. Data indicates groundwater is typically encountered between 1.5 feet and 4.5 feet below ground surface (bgs), and flows to the north-northwest. Data from October 2016 indicated that all groundwater samples were below applicable Table C cleanup levels. However, purge water from RSE-3 emitted a hydrocarbon odor. Historically, RSE-3 has yielded the highest results for DRO.

OBJECTIVES

This field effort sought to provide additional groundwater data for the wells located at the Hurricane Siding site to either support observed trends of natural attenuation, or indicate whether additional monitoring or other actions are required following the 2015 removal of impacted soil. Detections for fuel constituents were uniform across the monitoring wells, with two (2) exceedances of applicable regulatory standards noted in the Results section, below.

GROUNDWATER SAMPLING

Based upon the results of previous investigations, RSE identified the following contaminants of potential concern (COPCs):

Table A. Contaminants of Potential Concern

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Table C Groundwater Cleanup
Gasoline Range Organics	Water	GRO	AK 101	2.2 mg/L
Diesel Range Organics	Water	DRO	AK 102	1.5 mg/L
Benzene	Water	Collectively referred to as BTEX	EPA 8021B	4.6 ug/L
Toluene	Water			1100 ug/L
Ethylbenzene	Water			15 ug/L
Total Xylenes	Water			190 ug/L
Volatile Organic Compounds*	Water	VOCs	EPA 8260	Varies
Polycyclic Aromatic Hydrocarbons*	Water	PAH SIMS	EPA 8270D	Varies

* Full-list VOCs and PAH SIMs reserved for well showing greatest indicator of contamination.

RSE qualified environmental personnel mobilized to the subject area on September 24, 2017. RSE first examined the condition of each well; no compromise to the wells was identified. Well RSE-4 required locating via a magnetic locator as significant brush had grown up around it. However, the well itself was observed to be in good working condition. RSE measured the depth to the bottom of each well, and the depth to groundwater; groundwater was observed to be between approximately 1 and 4 feet below ground surface (bgs). Following this observation, RSE then purged three (3) well volumes from each well using a low-flow submersible pump. Water quality

parameters were monitored using a YSI 556 for stabilization when readings collected 3-5 minutes apart were within the following:

- pH
- Temperature
- Conductivity
- Specific Conductance
- Salinity

RSE re-measured the depth to groundwater following purging and prior to sampling. Water samples were collected using a positive-pressure submersible pump set to a low flow rate during sampling. Prior to purging, the depth to was measured with a water level indicator. The target flow rate during low-flow purging and sampling was less than 0.5 L/min (8 gallons per hour). Turbidity levels remained consistent throughout purging of the wells, with the greatest turbidity observed in RSE-3. A sheen was observed during purging on RSE-4, which triggered a series of field-decisions as discussed subsequently in this letter report.

One (1) sample was collected from each well. Monitoring wells RSE-1, RSE-2, and RSE-3 were sampled for GRO, BTEX, DRO and RRO. Based upon the presence of a sheen and odor produced from the purge water in RSE-4, this well was sampled from DRO, RRO, PAHs, and VOCs in lieu of RSE-3. A duplicate sample was submitted to the laboratory for quality control purposes. Generally, each of the wells were good producers with rapid recharge. RSE-2 is the exception, which went dry after two purge volumes. The sample was collected from the recharge.

The water samples were collected using new, dedicated tubing. The water level indicator, submersible pump, and other equipment that was not disposable or dedicated was decontaminated with distilled water and Alconox wash in the field. As water samples were collected, care was taken to minimize volatile loss by excessive turbulence or air mixing. Water samples were placed directly into method specific containers and stored in a clean sample cooler transported under chain-of-custody to SGS North America located in Anchorage, Alaska. Table B, on the following page, shows the containers, preservation, and holding times for the groundwater samples:

Table B. Containers, Preservation, and Holding Times for Groundwater Samples

COPC	Matrix	Lab Method	Sample Container	Preservation	Holding Time
DRO	Water	AK 102	1x 250 mL glass Teflon-lined cap	HCl 0 – 6° C	7 days to extract, <40 days to analysis
GRO	Water	AK 103	3x40 ml Volatile organic analysis (VOA) vials, minimize headspace	HCl 0 – 6° C	14 days
BTEX	Water	EPA 8021	3x40 ml Volatile organic analysis (VOA) vials, minimize headspace	HCl 0 – 6° C	14 days
VOCs	Water	EPA 8260	3x40 mL Volatile organic analysis vials, minimize headspace	HCl 0 – 6° C	14 days
PAH SIMS	Water	EPA 8270D	1L amber jar with Teflon lined cap	2 – 6° C	14 days to extract, <40 days to analysis

The submersible pump was decontaminated using Alconox and distilled water between sampling at each well. The Investigative Derived Waste section, below, describes filtration of the decontamination water. Field notes are included in Attachment G.

RESULTS

Monitoring well RSE-3 yielded 1.95 mg/L DRO, exceeding the ADEC Groundwater Cleanup Level (AGCL) of 1.5 mg/L DRO. Monitoring wells RSE-1, RSE-2 and RSE-4 resulted in DRO concentrations ranging from 0.351 mg/L to 1.36 mg/L DRO. Although field indicators suggested RSE-4 was the most contaminated of the wells, data indicates that RSE-3 continues to yield the greatest results.

RSE-4 resulted in 3.08 ug/L naphthalene, exceeding the AGCL of 1.7 ug/L from the VOC analysis. PAH SIMS results yielded from RSE-4 were below AGCLs.

Refer to Attachment B for complete tabulated analytical results, and Attachment E for the SGS lab report.

Historically, RSE-3 has produced the highest concentration of DRO on site with a maximum detected concentration of 5.51 mg/L (2013). In August of 2016, all wells sampled yielded all analyte concentrations below Table C Groundwater Cleanup levels. Previously, both RSE-3 and RSE-4 have produced purge water emitting a hydrocarbon odor. Data from the fall 2017 field effort indicates that hydrocarbon concentrations have remained somewhat consistent since the previous sampling event in 2015, with a nominal increase at the most highly impacted location.

INVESTIGATIVE DERIVED WASTE

Consumables such as tubing and gloves were placed into a trash receptacle for disposal. Non-consumables such water level indicator and submersible pump were decontaminated using Alconox and hot water between sampling at each well. Tubing for water samples was dedicated to each well and disposed of following use.

Purge water and water used in decontamination of the sampling equipment was passed through a granular activated carbon (GAC) filter and discharged into a densely vegetated area onsite.

Purge water from RSE-4, which contained a sheen, was filtered through the GAC and discharged onsite. This action represents a deviation from the work plan. However, provided the DRO concentrations from this well were below AGCLs, and the water was included with purge water free of sheen and passed through a filter, the discharge represents a de minimis quantity at most. All outflow from the GAC was free of sheen.

QUALITY ASSURANCE AND QUALITY CONTROL

RSE collected each sample in general accordance with applicable ADEC regulation and guidance documents. A single blind duplicate (RSE-X, duplicate of RSE-3) was submitted to the laboratory for quality control for primary analytes. The work plan did not specify which analytes were to be submitted for duplicate processing, and RSE submitted the primary suite of DRO, RRO, and BTEX rather than full list VOCs and PAHs. In our experience, duplicate analyses of these methods rarely produce usable data for comparison.

All relative percent differences between RSE-X and RSE-3 were within the target of 30%.

RSE has completed the ADEC Laboratory Review checklist (Attachment E). All data was determined to be usable for comparison with the ADEC Table C Groundwater cleanup levels.

The ADEC workplan stated RSE-3 would be analyzed for full list VOCs and PAHs given RSE-3 has yielded the highest contaminant concentrations in past sampling events. However, purge water from RSE-4 produced a sheen and odor whereas RSE-3 did not, indicating potentially higher contamination. RSE-4 was sampled for VOCs and PAH SIMs based on this field observation. The field determination was thought to be in the best interest of providing comprehensive data for the site. However, data indicated that, despite being free of observable sheen and odor, RSE-3 remains the most impacted well location.

CONCLUSION

Results for the September 2017 sampling effort indicated concentrations of DRO in RSE-3 and naphthalene in monitoring well RSE-4 are elevated above AGCLs. RSE-3 has yielded results exceeding ADEC Table C cleanup levels in previous sampling events, and this trend appears to persist. RSE- 3 exhibited elevated DRO concentrations in 2013 (5.51 mg/L), 2015 (1.88 mg/L), and 2017 (1.95 mg/L). During sampling events in 2012 and 2015, DRO impacts were below ADEC Table C cleanup levels; however, hydrocarbon odor was noted during those sampling events.

Please contact Emily Mahanna at ext. 110, if you have any questions or comments. It is our pleasure to work with the ADEC on this project.

This report was prepared by an ADEC-qualified environmental professional in accordance with 18 AAC 75/78.

Emily Mahanna, EIT

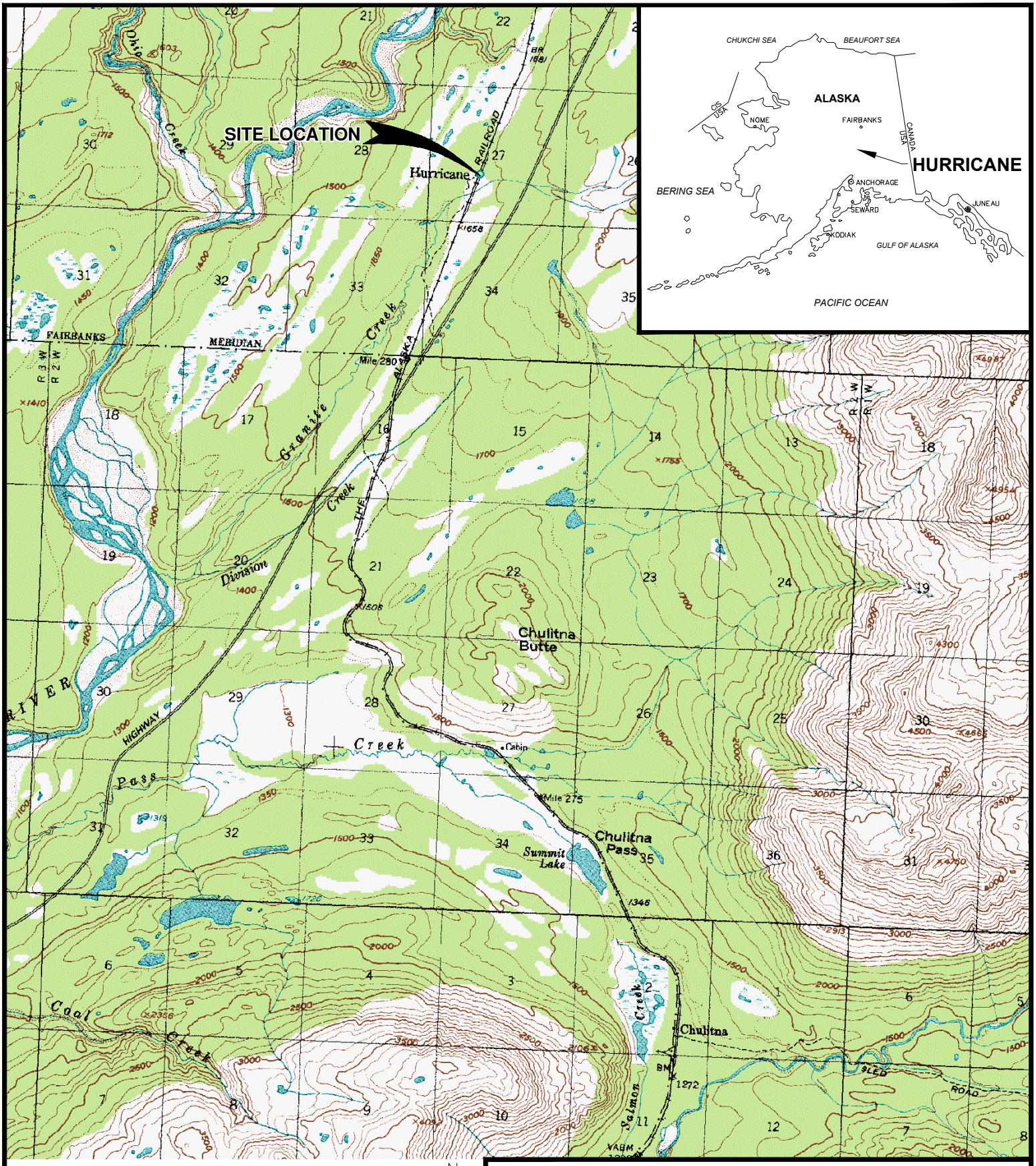
RESTORATION SCIENCE & ENGINEERING, LLC

Attachments:

- Attachment A- Figures
- Attachment B- Laboratory Results
- Attachment C- Photographs
- Attachment D- ADEC Laboratory Data Review Checklist
- Attachment E- SGS Laboratory Report
- Attachment F- Field Notes

ATTACHMENT A

Figures



HURRICANE SECTION HOUSE

VICINITY MAP

HURRICANE, ALASKA

JOB NO: 17-1702	DRAWN: JRH
DATE: 11.28.2017	CHECKED: DN/EM

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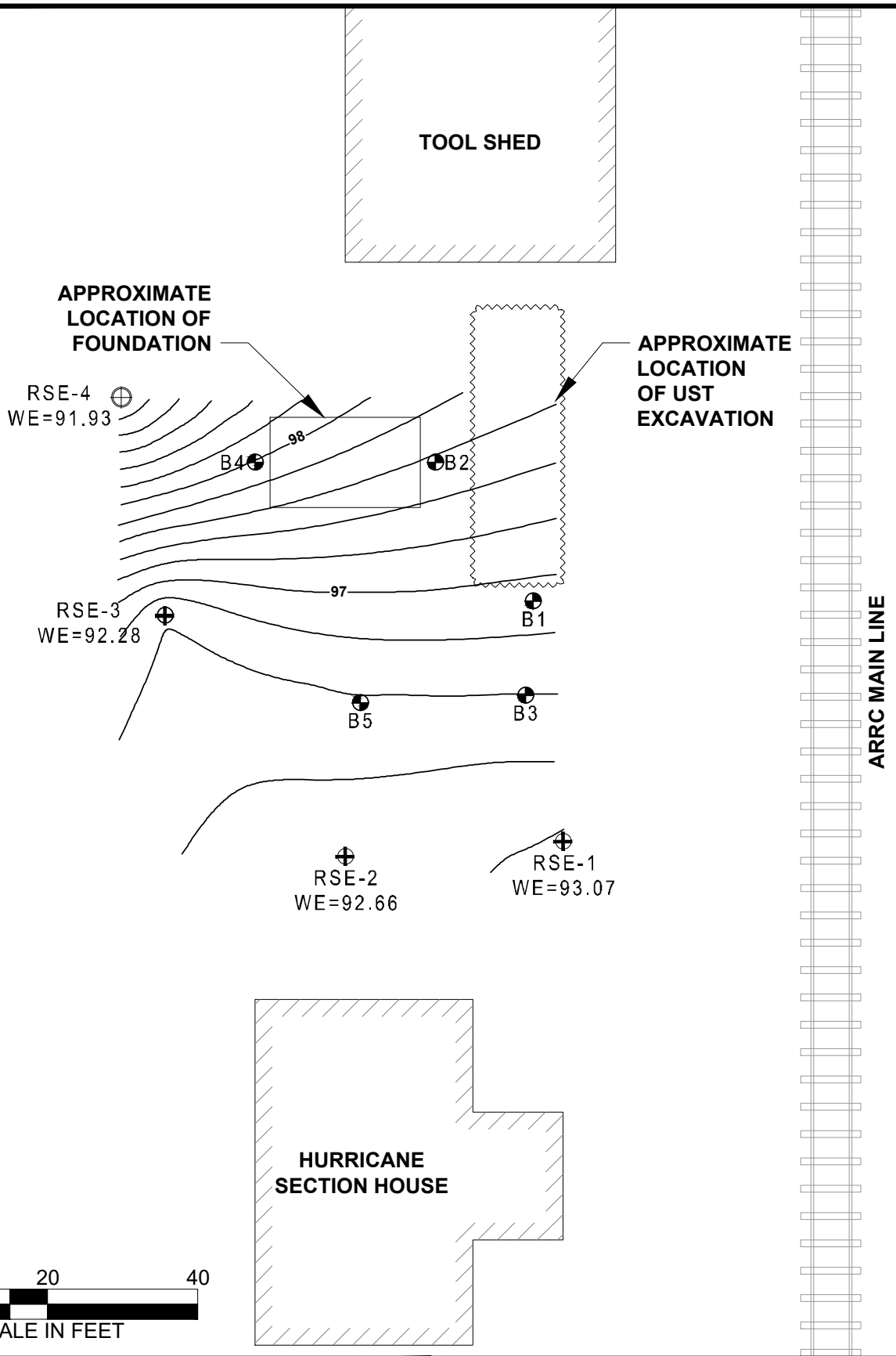
FIGURE 1



LEGEND

RSE-1 — **APPROXIMATE LOCATION OF MONITORING WELL**

B1 — **CLARUS SOIL BORING LOCATION**

WE — **WELL ELEVATION**

HURRICANE SECTION HOUSE

SITE PLAN

HURRICANE, ALASKA

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JOB NO: 17-1702	DRAWN: JRH
DATE: 11.28.2017	CHECKED: DN/EM

FIGURE 2

ATTACHMENT B

Laboratory Results

Table 1 - Groundwater Quality Field Parameters
ARRC Hurricane
Alaska Railroad Corporation (ARRC)
November 2017

GROUNDWATER QUALITY FIELD PARAMETERS												
SAMPLE LOCATION	**DATE**	**DEPTH TO BOTTOM (feet)**	**VOLUME PURGED (gal)**	**TIME (hh:mm)**	**DEPTH TO WATER (feet)**	**WATER REMOVED (gal)**	**TEMP (°C)**	**pH (pH Units)**	**CONDUCTIVITY (mS/cm)**	**SPECIFIC CONDUCTANCE (µS/cm)**	**SALINITY (ppt)**	**OBSERVATIONS**
MONITORING WELLS												
RSE-1	8/24/2017	7.71	2.8	10:10	3.79	0.7	9.3	5.84	20.4	14.3	0.0	light brown, no sheen, no odor
				10:12	3.85	1.4	7.5	6.04	27.3	49.2	0.0	
				10:14	3.98	2.1	7.1	6.06	33.0	50.3	0.0	
				10:16	4.02	2.8	7.0	6.03	33.1	50.7	0.0	
RSE-2	8/24/2017	7.58	1.4	10:40	3.71	0.7	8.7	6.30	1.7	3.1	0.0	turbid, murkey, no sheen or odor, well dry after 2 purge volumes
				10:42	7.58	1.4	9.3	5.97	1.5	2.5	0.0	
RSE-3	8/24/2017	7.66	3.2	11:05	3.41	0.8	8.7	6.22	157.7	228.3	0.0	very turbid, dark brown, no sheen or odor
				11:10	4.05	1.6	8.5	5.99	90.5	130.2	0.0	
				11:15	5.66	2.4	8.7	5.90	81.7	118.6	0.0	
				11:20	5.97	3.2	8.8	5.89	80.7	117.3	0.0	
RSE-4	8/24/2017	6.72	4	12:10	6.54	1.0	8.4	6.28	74.7	83.7	0.0	gray, dark, turbid, sheen
				12:15	4.50	2.0	8.9	6.23	70.3	102.3	0.0	
				12:18	3.11	3.0	8.7	6.21	85.5	111.7	0.0	
				12:20	1.14	4.0	8.7	6.21	84.7	103.0	0.0	

1) Water quality measurements performed using a YSI Model 556 Water Quality Meter

2) Purging of well was done with a bailer

3) mS/cm = millisiemens per centimeter; µS/cm = micro Siemens per centimeter; ppt = parts per thousand; mV= millivolts; mg/L= milligram per liter; gal= gallon

Table 2 - Hydrocarbons in Groundwater
ARRC Hurricane
Alaska Railroad Corporation (ARRC)
November 2017

HYDROCARBONS IN GROUNDWATER									
SAMPLE ID	DATE	DIESEL RANGE ORGANICS (mg/L)	RESIDUAL RANGE ORGANICS mg/L	GASOLINE RANGE ORGANICS (mg/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	XYLENES (ug/L)	SGS PROJECT NO.
RSE-1	8/24/2017	**0.351 J**	**0.539**	*0.0500 U*	*0.250 U*	*0.500 U*	*0.500 U*	*1.00 U*	
RSE-2	8/24/2017	**0.692**	**0.889**	*0.0500 U*	*0.250 U*	*0.500 U*	*0.500 U*	*1.00 U*	
RSE-3	8/24/2017	**1.95**	**0.735**	*0.0500 U*	*0.250 U*	*0.500 U*	*0.500 U*	**0.320 J**	11765050
RSE-4	8/24/2017	**1.36**	**0.734**	--	*0.200 U*	*0.500 U*	**0.520 J**	**5.52**	
RSE-X	8/24/2017	**1.82**	**0.686**	*0.0500U*	*0.250 U*	*0.500 U*	*0.500 U*	**0.350 J**	
ADEC GROUNDWATER CLEANUP LEVELS TABLE C (18 AAC 75)		**1.5**	**1.1**	**2.2**	**4.6**	**1100**	**15**	**190**	

NOTES:

1) Diesel Range Organics (DRO) samples analyzed by AK Method 102; Residual Range Organics (RRO) samples analyzed by AK Method 103
Gasoline Range Organics (GRO) samples analyzed by AK Method 101; BTEX samples analyzed by EPA 8260D

2) "mg/L" means "milligrams per liter"; "ug/L" means "micrograms per liter".

3) **Bold** font indicates the analyte was detected above the Laboratory Limit of Detection (LOD).

4) *Italicized* font with a U-flag indicates the analyte was not detected at the LOD; the value presented is the LOD

5) J flag indicates the result is an estimated value

Table 3 - Volatile Organic Compounds in Groundwater
ARRC Hurricane
Alaska Railroad Corporation (ARRC)
November 2017

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER		
SAMPLE ID	RSE-4	**ADEC Table C**
Date	8/24/2017	**Groundwater Cleanup**
SGS Work Order	1176050	**Levels**
Units	(ug/L)	**(µg/L)**
1,1,1,2-Tetrachloroethane	*0.250 U*	5.7
1,1,1-Trichloroethane	*0.500 U*	8,000
1,1,2,2-Tetrachloroethane	*0.250 U*	0.76
1,1,2-Trichloroethane	*0.200 U*	0.41
1,1-Dichloroethane	*0.500 U*	28
1,1-Dichloroethene	*0.500 U*	280
1,1-Dichloropropene	*0.500 U*	
1,2,3-Trichlorobenzene	*0.500 U*	7.0
1,2,3-Trichloropropane	*0.500 U*	0.0075
1,2,4-Trichlorobenzene	*0.500 U*	4.0
1,2,4-Trimethylbenzene	**4.33**	15
1,2-Dibromo-3-chloropropane	*5.00 U*	
1,2-Dibromoethane	*0.0375 U*	0.075
1,2-Dichlorobenzene	*0.500 U*	300
1,2-Dichloroethane	*0.250 U*	1.7
1,2-Dichloropropane	*0.500 U*	4.4
1,3,5-Trimethylbenzene	**3.15**	120
1,3-Dichlorobenzene	*0.500 U*	300
1,3-Dichloropropane	*0.250 U*	4.4
1,4-Dichlorobenzene	*0.250 U*	4.8
2,2-Dichloropropane	*0.500 U*	
2-Butanone (MEK)	*5.00 U*	5,600
2-Chlorotoluene	*0.500 U*	
2-Hexanone	*5.00 U*	38
4-Chlorotoluene	*0.500 U*	
4-Isopropyltoluene	**1.50**	
4-Methyl-2-pentanone (MIBK)	*5.00 U*	6,300
Benzene	*0.200 U*	4.6
Bromobenzene	*0.500 U*	62
Bromochloromethane	*0.500 U*	
Bromodichloromethane	*0.250 U*	1.3
Bromoform	*0.500 U*	33
Bromomethane	*2.50 U*	7.5
Carbon disulfide	*5.00 U*	810
Carbon tetrachloride	*0.500 U*	4.6
Chlorobenzene	*0.250 U*	78
Chloroethane	*0.500 U*	
Chloroform	*0.500 U*	2.2
Chloromethane	*0.500 U*	190
cis-1,2-Dichloroethene	*0.500 U*	36
cis-1,3-Dichloropropene	*0.250 U*	
Dibromochloromethane	*0.250 U*	8.7
Dibromomethane	*0.500 U*	8.3
Dichlorodifluoromethane	*0.500 U*	200
Ethylbenzene	**0.520 J**	15
Freon-113	*5.00 U*	55000
Hexachlorobutadiene	*0.500 U*	1.4
Isopropylbenzene (Cumene)	**0.360 J**	450
Methylene chloride	*2.50 U*	110
Methyl-t-butyl ether	*5.oo U*	140
Naphthalene	**3.08**	1.7
n-Butylbenzene	*0.500 U*	1,000
n-Propylbenzene	**0.720 J**	660
o-Xylene	**3.55**	See Total Xylenes
P & M -Xylene	**1.97 J**	See Total Xylenes
sec-Butylbenzene	**0.630 J**	2,000
Styrene	*0.500 U*	1,200
tert-Butylbenzene	*0.500 U*	690
Tetrachloroethene	*0.500 U*	41
Toluene	*0.500 U*	1,100
trans-1,2-Dichloroethene	*0.500 U*	360
trans-1,3-Dichloropropene	*0.500 U*	4.7
Trichloroethene	*0.500 U*	2.8
Trichlorofluoromethane	*0.500 U*	5,200
Vinyl acetate	*5.00 U*	410
Vinyl chloride	*0.0750 U*	0.19
Xylenes (total)	**5.52**	190

NOTES:

1) Volatile organic compounds (VOC) analyses by Method EPA SW8260C
2) "ug/Kg" means "micrograms per kilogram"
3) **Bold** font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD
5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ
6) Yellow highlighting indicates the analyte was detected above the ADEC Method 2 - Soil Cleanup Level

Table 4- Polynuclear Aromatic Hydrocarbons in Groundwater
ARRC Hurricane
Alaska Railroad Corporation (ARRC)
November 2017

POLYNUCLEAR AROMATIC HYDROCARBONS IN GROUNDWATER		
SAMPLE ID **DATE**	**RSE-4** 8/24/2017	**ADEC TABLE C GROUNDWATER CLEANUP LEVELS**
UNITS	(ug/L)	(µg/L)
1-Methylnaphthalene	**0.146**	11
2-Methylnaphthalene	**0.0215**	36
Acenaphthene	**0.0569**	530
Acenaphthylene	*0.00685 U*	260
Anthracene	*0.00685 U*	43
Benzo(a)Anthracene	*0.00685 U*	0.12
Benzo[a]pyrene	*0.00273 U*	0.34
Benzo[b]Fluoranthene	*0.00685 U*	0.34
Benzo[g,h,i]perylene	*0.00685 U*	0.26
Benzo[k]fluoranthene	*0.00685 U*	0.8
Chrysene	*0.00685 U*	2
Dibenzo[a,h]anthracene	*0.00273 U*	0.034
Fluoranthene	*0.00685 U*	260
Fluorene	**0.102**	4.3
Indeno[1,2,3-c,d] pyrene	*0.00685 U*	0.19
Naphthalene	**0.0926**	1.7
Phenanthrene	**0.0256 J**	170
Pyrene	*0.0273 U*	120

NOTES:

1) PAH SIM analyses by Method EPA 8270D

2) Bold font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)

3) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD

4) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ

Table 5 - Historic Hydrocarbons in Groundwater
ARRC Hurricane
Alaska Railroad Corporation (ARRC)
November 2017

HYDROCARBONS IN GROUNDWATER					
SAMPLE ID	**DATE**	**SAMPLE TYPE (Primary or Duplicate)**	**DIESEL RANGE ORGANICS (mg/L)**	**RESIDUAL RANGE ORGANICS mg/L**	**GASOLINE RANGE ORGANICS (mg/L)**
RSE-1					
RSE-1	9/9/2011	Primary	*ND (0.3)*	*ND (0.3)*	ND (0.06)
RSE-1	9/14/2012	Primary/Duplicate	*ND (0.34)/ND (0.362)*	*ND (0.34)/ND (0.434)*	ND (0.062)/ ND(0.062)
RSE-1	6/12/2013	Primary	**0.323 J**	**0.567**	ND (0.062)
RSE-1	9/26/2014	Primary	*ND (0.310)*	*ND (0.259)*	ND (0.05)
RSE-1	8/24/2017	Primary	**0.351 J**	**0.539**	*0.0500 U*
RSE-2					
RSE-2	9/9/2011	Primary	**0.311 J**	*ND (0.3)*	ND (0.06)
RSE-2	9/14/2012	Primary	*ND (0.36)*	*ND (0.3)*	ND (0.062)
RSE-2	6/12/2013	Primary	**0.237 J**	**0.388**	ND (0.062)
RSE-2	9/26/2014	Primary	*ND (0.308)*	*ND (0.256)*	ND (0.05)
RSE-2	8/24/2017	Primary	**0.692**	**0.889**	*0.0500 U*
RSE-3					
RSE-3	9/9/2011	Primary/Duplicate	**0.498 J/ 0.431 J**	*ND (0.3)/ND (0.3)*	*ND (0.06)/ ND (0.06)*
RSE-3	9/14/2012	Primary	**0.779**	*ND (0.3)*	*ND (0.062)*
RSE-3	6/12/2013	Primary	**5.51**	**1.34**	*ND (0.062)*
RSE-3	9/26/2014	Primary/Duplicate	**1.88/1.57**	**0.330 J/0.252 J**	*ND (0.05)/ ND (0.05)*
RSE-3	8/24/2017	Primary/Duplicate	**1.95/ 1.82**	**0.735/ 0.686**	*0.0500 / 0.0500 U*
RSE-4					
RSE-4	9/9/2011	Primary	**1.52**	*ND (0.3)*	**0.0833 J**
RSE-4	9/14/2012	Primary	**0.601 J**	*ND (0.338)*	*0.0456 J*
RSE-4	6/12/2013	Primary/Duplicate	**0.425 J/0.385 J**	**0.252 J/ 0.385 J**	**0.0341 J**/ *ND (0.062)*
RSE-4	9/26/2014	Primary	**0.58 J**	**0.580 J**	*ND (0.05)*
RSE-4	8/24/2017	Primary	**1.36**	**0.734**	--
ADEC GROUNDWATER CLEANUP LEVELS TABLE C (18 AAC 75)			**1.5**	**1.1**	**2.2**

NOTES:

1) Diesel Range Organics (DRO) samples analyzed by AK Method 102; Residual Range Organics (RRO) samples analyzed by AK Method 103
Gasoline Range Organics (GRO) samples analyzed by AK Method 101; BTEX samples analyzed by EPA 8260D
2) "mg/L" means "milligrams per liter"; "ug/L" means "micrograms per liter".
3) **Bold** font indicates the analyte was detected above the Laboratory Limit of Detection (LOD).
4) *Italicized* font with a U-flag indicates the analyte was not detected at the LOD; the value presented is the LOD
5) J flag indicates the result is an estimated value
6) Yellow highlighting indicates the analyte was detected above the ADEC Groundwater Cleanup Level
7) ND indicates non-detect from previous reports

ATTACHMENT C

Photographs

RSE-1 exterior.

RSE-3 interior.

RSE-2 with water collected on interior.

Sample set up at RSE-2.

RSE-4 exterior.

RSE-1 sample set up.

Purge water from RSE-3.

Interior RSE-4.

Sheen observed on RSE-4.

Temporary storage of IDW prior to GAC filtration.

ATTACHMENT D

ADEC Laboratory Checklist

Laboratory Data Review Checklist

Completed by: Emily Mahanna

Title: ARRC – Hurricane Former UST Site Date: 10/13/2017

CS Report Name: ARRC Hurricane GW Report Date: 9/6/17

Consultant Firm: Restoration Science & Engineering, LLC

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1176050

ADEC File Number: 2258.26.008 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      SGS North America, Inc. located in Anchorage, Alaska.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐Yes ☐ No ☒NA (Please explain.) Comments:

      All samples were analyzed at SGS North America

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      A copy of the signed COC is provided at the end of this document.

   b. Correct analyses requested?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      SGS completed the requested analyses requested on the COC.

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      The sample cooler temperature blank was 2.4°C when delivered to SGS.

   b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
      ☒**Yes** ☐ No ☐ NA (Please explain.) Comments:

      Waters were properly acidified.

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
☒Yes ☐ No ☐NA (Please explain.) Comments:

All samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No discrepancies were documented.

e. Data quality or usability affected? (Please explain.)
Comments:

Data quality and usability was not affected.

4. Case Narrative
a. Present and understandable?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

The case narrative is present and understandable on page 2 of the lab report.

b. Discrepancies, errors or QC failures identified by the lab?
☒Yes ☐ No ☐NA (Please explain.) Comments:

LCS/LCSD RPDs for several analytes do not meet QC criteria.

c. Were all corrective actions documented?
☐ Yes ☐ No ☒NA (Please explain.) Comments:

No corrective actions were required because these analytes were not detected in associated samples.

d. What is the effect on data quality/usability according to the case narrative?
Comments:

There is no effect on data quality and usability.

5. Samples Results
a. Correct analyses performed/reported as requested on COC?
☒Yes ☐ No ☐NA (Please explain.) Comments:

The correct analyses were performed and reported as requested on the COC.

All holding times were met.

b. All applicable holding times met?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

c. All soils reported on a dry weight basis?
☒Yes ☐ No ☒NA (Please explain.) Comments:

All samples were reported on a dry weight basis.

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

SGS refers to the PQL as the LOQ and reports data below the PQL but above the detection limit (DL) as estimated results with a "J". Constituents that were analyzed for but not detected are reported as a value equal to 2 times the DL and flagged with a "U". All PQLs were below the cleanup level.

e. Data quality or usability affected?
Comments:

There is no effect on data quality or usability.

6. QC Samples
a. Method Blank
i. One method blank reported per matrix, analysis and 20 samples?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

There is one method blank for each requested analyses and matrix per 20 samples submitted.

ii. All method blank results less than PQL?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

All method blank results are less than the LOQ (PQL).

iii. If above PQL, what samples are affected?
Comments:

No method blank samples were reported above the LOQ (PQL).

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
☐Yes ☐ No ☒NA (Please explain.) Comments:

No method blank samples were reported above the LOQ (PQL).

v. Data quality or usability affected? (Please explain.)

Data quality or usability was not affected.

c. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐ NA (Please explain.) Comments:

One LCS and LCSDs were performed per analysis (less than 20 samples submitted).

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

☐ Yes ☐ No ☒NA (Please explain.) Comments:

No metal or inorganic analysis were completed.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

☒Yes ☐ No ☐NA (Please explain.) Comments:

All percent recoveries were within method and laboratory limits.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☐Yes ☒ No ☐ NA (Please explain.) Comments:

Percent recoveries for 1,2-dibromo-3-chloropropane (21.00%), 2-Butanone (MEK) (29.40 %) and 4-Meythl-2-pentanone (MIBK) (20.30%) exceeded laboratory limits.

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

Sample RSE-4 was the only sample affected.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

Data flags are clearly defined and described in the case narrative. In the exceedances described above, data is flagged with an asterisks (*).

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

No corrective actions were required. All affected analytes were not detected within RSE-4.

d. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Surrogate recoveries are reported for all organic analyses.

☒Yes ☐ No ☐NA (Please explain.) Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
☒Yes ☐ No ☐ NA (Please explain.) Comments:

All %R were reported and within limits.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
☐ Yes ☐ No ☒NA (Please explain.) Comments:

No samples had failed surrogate recoveries.

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

Data quality or usability not affected

e. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒Yes ☐ No ☐NA (Please explain.) Comments:

One trip blank included per sample cooler containing volatile samples.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒Yes ☐ No ☐ NA (Please explain.) Comments:

Trip blank is clearly indicated on the COC.

iii. All results less than PQL?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

All results are non-detect at the LOQ (PQL).

iv. If above PQL, what samples are affected?
Comments:

No affected samples.

v. Data quality or usability affected? (Please explain.)
Comments:

Data quality and usability not affected.

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
☐Yes ☒ No ☐ NA (Please explain.) Comments:

RSE-X is a bling duplicate of RSE-3. RSE-X was not analyzed for methods EPA 8260 and EPA 8270.

ii. Submitted blind to lab?
☒Yes ☐ No ☐ NA (Please explain.) Comments:

Duplicate samples were submitted blind to the lab.

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

☒Yes ☐ No ☐NA (Please explain.) Comments:

All RPDs were less than 30%.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality or usability is not affected. Given all RPDs were less than 30%, it is unlikely lab error occurred in methods EPA 8260 and EPA 8270.

g. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☒ No ☐NA (Please explain.) Comments:

An equipment blank was not used because all tubing was clean and dedicated to each well, and the submersible pump was thoroughly decontaminated between each well use.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

There are no decontamination or equipment blanks.

ii. If above PQL, what samples are affected?

Comments:

There are no decontamination equipment blanks.

Data quality or usability was not affected.

iii. Data quality or usability affected? (Please explain.)

Comments:

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

Data flags and qualifiers are defined appropriately. Page 4 of the lab report describes the qualifiers used.

ATTACHMENT E

SGS Laboratory Report

Laboratory Report of Analysis

To: AK Railroad Corp (ARRC)
327 W. Ship Creek Ave
Anchorage, AK 99501
907265-2429

Report Number: **1176050**

Client Project: **AKRR Hurricane GW**

Dear Russell Grandel,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Chuck at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

_____

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

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Case Narrative

SGS Client: **AK Railroad Corp (ARRC)**
SGS Project: **1176050**
Project Name/Site: **AKRR Hurricane GW**
Project Contact: **Russell Grandel**

Refer to sample receipt form for information on sample condition.

LCSD for HBN 1767466 [VXX/3120 (1410001) LCSD

8260C - LCS/LCSD RPDs for several analytes do not meet QC criteria. These analytes were not detected in associated samples.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
RSE-1	1176050001	08/24/2017	08/25/2017	Water (Surface, Eff., Ground)
RSE-2	1176050002	08/24/2017	08/25/2017	Water (Surface, Eff., Ground)
RSE-3	1176050003	08/24/2017	08/25/2017	Water (Surface, Eff., Ground)
RSE-4	1176050004	08/24/2017	08/25/2017	Water (Surface, Eff., Ground)
RSE-X	1176050005	08/24/2017	08/25/2017	Water (Surface, Eff., Ground)
Trip Blank	1176050006	08/24/2017	08/25/2017	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Vol GC/MS Liq/Liq ext.
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water
AK101	Gasoline Range Organics (W)
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **RSE-1**
Lab Sample ID: 1176050001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.351J	mg/L
	Residual Range Organics	0.539	mg/L

Client Sample ID: **RSE-2**
Lab Sample ID: 1176050002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	0.692	mg/L
	Residual Range Organics	0.889	mg/L

Client Sample ID: **RSE-3**
Lab Sample ID: 1176050003

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.95	mg/L
	Residual Range Organics	0.735	mg/L
Volatile Fuels	o-Xylene	0.320J	ug/L

Client Sample ID: **RSE-4**
Lab Sample ID: 1176050004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.146	ug/L
	2-Methylnaphthalene	0.0215	ug/L
	Acenaphthene	0.0569	ug/L
	Fluorene	0.102	ug/L
	Naphthalene	0.0926	ug/L
	Phenanthrene	0.0256J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	1.36	mg/L
	Residual Range Organics	0.734	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	4.33	ug/L
	1,3,5-Trimethylbenzene	3.15	ug/L
	4-Isopropyltoluene	1.50	ug/L
	Ethylbenzene	0.520J	ug/L
	Isopropylbenzene (Cumene)	0.360J	ug/L
	Naphthalene	3.08	ug/L
	n-Propylbenzene	0.720J	ug/L
	o-Xylene	3.55	ug/L
	P & M -Xylene	1.97J	ug/L
	sec-Butylbenzene	0.630J	ug/L
	Xylenes (total)	5.52	ug/L

Client Sample ID: **RSE-X**
Lab Sample ID: 1176050005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	1.82	mg/L
	Residual Range Organics	0.686	mg/L
Volatile Fuels	o-Xylene	0.350J	ug/L

Client Sample ID: **Trip Blank**
Lab Sample ID: 1176050006

	Parameter	Result	Units
Volatile GC/MS	Methylene chloride	1.08J	ug/L

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050001
Lab Project ID: 1176050

Collection Date: 08/24/17 10:20
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.351	J	0.588	0.176	mg/L	1		08/31/17 12:43
Surrogates								
5a Androstane (surr)	83.8		50-150		%	1		08/31/17 12:43

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 12:43
Container ID: 1176050001-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.539		0.490	0.147	mg/L	1		08/31/17 12:43
Surrogates								
n-Triacontane-d62 (surr)	92.2		50-150		%	1		08/31/17 12:43

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 12:43
Container ID: 1176050001-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050001
Lab Project ID: 1176050

Collection Date: 08/24/17 10:20
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U		0.100	0.0310	mg/L	1		08/25/17 21:27
Surrogates								
4-Bromofluorobenzene (surr)	92.8		50-150		%	1		08/25/17 21:27

Batch Information

Analytical Batch: VFC13840
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/25/17 21:27
Container ID: 1176050001-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U		0.500	0.150	ug/L	1		08/25/17 21:27
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/25/17 21:27
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/25/17 21:27
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/25/17 21:27
Toluene	0.500 U		1.00	0.310	ug/L	1		08/25/17 21:27
Surrogates								
1,4-Difluorobenzene (surr)	91.4		77-115		%	1		08/25/17 21:27

Batch Information

Analytical Batch: VFC13840
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/25/17 21:27
Container ID: 1176050001-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/06/2017 1:26:21PM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050002
Lab Project ID: 1176050

Collection Date: 08/24/17 10:55
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.692		0.600	0.180	mg/L	1		08/31/17 12:54
Surrogates								
5a Androstane (surr)	77.8		50-150		%	1		08/31/17 12:54

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 12:54
Container ID: 1176050002-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.889		0.500	0.150	mg/L	1		08/31/17 12:54
Surrogates								
n-Triacontane-d62 (surr)	83.6		50-150		%	1		08/31/17 12:54

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 12:54
Container ID: 1176050002-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050002
Lab Project ID: 1176050

Collection Date: 08/24/17 10:55
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U		0.100	0.0310	mg/L	1		08/25/17 21:47
Surrogates								
4-Bromofluorobenzene (surr)	96		50-150		%	1		08/25/17 21:47

Batch Information

Analytical Batch: VFC13840
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/25/17 21:47
Container ID: 1176050002-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U		0.500	0.150	ug/L	1		08/25/17 21:47
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/25/17 21:47
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/25/17 21:47
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/25/17 21:47
Toluene	0.500 U		1.00	0.310	ug/L	1		08/25/17 21:47
Surrogates								
1,4-Difluorobenzene (surr)	91.5		77-115		%	1		08/25/17 21:47

Batch Information

Analytical Batch: VFC13840
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/25/17 21:47
Container ID: 1176050002-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/06/2017 1:26:21PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050003
Lab Project ID: 1176050

Collection Date: 08/24/17 11:30
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.95		0.577	0.173	mg/L	1		08/31/17 13:04
Surrogates								
5a Androstane (surr)	81.2		50-150		%	1		08/31/17 13:04

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 13:04
Container ID: 1176050003-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.735		0.481	0.144	mg/L	1		08/31/17 13:04
Surrogates								
n-Triacontane-d62 (surr)	92.8		50-150		%	1		08/31/17 13:04

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 13:04
Container ID: 1176050003-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 1:26:21PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050003
Lab Project ID: 1176050

Collection Date: 08/24/17 11:30
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U		0.100	0.0310	mg/L	1		08/25/17 22:06
Surrogates								
4-Bromofluorobenzene (surr)	93.7		50-150		%	1		08/25/17 22:06

Batch Information

Analytical Batch: VFC13840
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/25/17 22:06
Container ID: 1176050003-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U		0.500	0.150	ug/L	1		08/25/17 22:06
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/25/17 22:06
o-Xylene	0.320 J		1.00	0.310	ug/L	1		08/25/17 22:06
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/25/17 22:06
Toluene	0.500 U		1.00	0.310	ug/L	1		08/25/17 22:06
Surrogates								
1,4-Difluorobenzene (surr)	89.8		77-115		%	1		08/25/17 22:06

Batch Information

Analytical Batch: VFC13840
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/25/17 22:06
Container ID: 1176050003-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/06/2017 1:26:21PM

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Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050004
Lab Project ID: 1176050

Collection Date: 08/24/17 12:25
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.146		0.0137	0.00404	ug/L	1		09/01/17 17:42
2-Methylnaphthalene	0.0215		0.0137	0.00404	ug/L	1		09/01/17 17:42
Acenaphthene	0.0569		0.0137	0.00404	ug/L	1		09/01/17 17:42
Acenaphthylene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Anthracene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Benzo(a)Anthracene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Benzo[a]pyrene	0.00273	U	0.00546	0.00164	ug/L	1		09/01/17 17:42
Benzo[b]Fluoranthene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Benzo[g,h,i]perylene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Benzo[k]fluoranthene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Chrysene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Dibenzo[a,h]anthracene	0.00273	U	0.00546	0.00164	ug/L	1		09/01/17 17:42
Fluoranthene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Fluorene	0.102		0.0137	0.00404	ug/L	1		09/01/17 17:42
Indeno[1,2,3-c,d] pyrene	0.00685	U	0.0137	0.00404	ug/L	1		09/01/17 17:42
Naphthalene	0.0926		0.0273	0.00852	ug/L	1		09/01/17 17:42
Phenanthrene	0.0256	J	0.0546	0.00404	ug/L	1		09/01/17 17:42
Pyrene	0.0273	U	0.0546	0.00404	ug/L	1		09/01/17 17:42
Surrogates								
2-Methylnaphthalene-d10 (surr)	73.9		47-106		%	1		09/01/17 17:42
Fluoranthene-d10 (surr)	57.2		24-116		%	1		09/01/17 17:42

Batch Information

Analytical Batch: XMS10367
Analytical Method: 8270D SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/01/17 17:42
Container ID: 1176050004-F

Prep Batch: XXX38274
Prep Method: SW3520C
Prep Date/Time: 08/26/17 09:06
Prep Initial Wt./Vol.: 915 mL
Prep Extract Vol: 1 mL

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Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050004
Lab Project ID: 1176050

Collection Date: 08/24/17 12:25
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.36		0.577	0.173	mg/L	1		08/31/17 13:14
Surrogates								
5a Androstane (surr)	76		50-150		%	1		08/31/17 13:14

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 13:14
Container ID: 1176050004-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.734		0.481	0.144	mg/L	1		08/31/17 13:14
Surrogates								
n-Triacontane-d62 (surr)	89		50-150		%	1		08/31/17 13:14

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 13:14
Container ID: 1176050004-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 260 mL
Prep Extract Vol: 1 mL

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Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050004
Lab Project ID: 1176050

Collection Date: 08/24/17 12:25
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/03/17 00:07
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,2,4-Trimethylbenzene	4.33		1.00	0.310	ug/L	1		09/03/17 00:07
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/03/17 00:07
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/03/17 00:07
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,3,5-Trimethylbenzene	3.15		1.00	0.310	ug/L	1		09/03/17 00:07
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/03/17 00:07
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/03/17 00:07
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
4-Isopropyltoluene	1.50		1.00	0.310	ug/L	1		09/03/17 00:07
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/03/17 00:07
Benzene	0.200	U	0.400	0.120	ug/L	1		09/03/17 00:07
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/03/17 00:07
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/03/17 00:07
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/03/17 00:07
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/03/17 00:07

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Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050004
Lab Project ID: 1176050

Collection Date: 08/24/17 12:25
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Chloromethane	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		09/03/17 00:07
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		09/03/17 00:07
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Ethylbenzene	0.520 J		1.00	0.310	ug/L	1		09/03/17 00:07
Freon-113	5.00 U		10.0	3.10	ug/L	1		09/03/17 00:07
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Isopropylbenzene (Cumene)	0.360 J		1.00	0.310	ug/L	1		09/03/17 00:07
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		09/03/17 00:07
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		09/03/17 00:07
Naphthalene	3.08		1.00	0.310	ug/L	1		09/03/17 00:07
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
n-Propylbenzene	0.720 J		1.00	0.310	ug/L	1		09/03/17 00:07
o-Xylene	3.55		1.00	0.310	ug/L	1		09/03/17 00:07
P & M -Xylene	1.97 J		2.00	0.620	ug/L	1		09/03/17 00:07
sec-Butylbenzene	0.630 J		1.00	0.310	ug/L	1		09/03/17 00:07
Styrene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Toluene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		09/03/17 00:07
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		09/03/17 00:07
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		09/03/17 00:07
Xylenes (total)	5.52		3.00	1.00	ug/L	1		09/03/17 00:07
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		81-118		%	1		09/03/17 00:07
4-Bromofluorobenzene (surr)	99.5		85-114		%	1		09/03/17 00:07
Toluene-d8 (surr)	98.9		89-112		%	1		09/03/17 00:07

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Results of **RSE-4**

Client Sample ID: **RSE-4**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050004
Lab Project ID: 1176050

Collection Date: 08/24/17 12:25
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17129
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 09/03/17 00:07
Container ID: 1176050004-A

Prep Batch: VXX31207
Prep Method: SW5030B
Prep Date/Time: 09/02/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050005
Lab Project ID: 1176050

Collection Date: 08/24/17 11:35
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1.82		0.588	0.176	mg/L	1		08/31/17 13:25
Surrogates								
5a Androstane (surr)	81.2		50-150		%	1		08/31/17 13:25

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Analyst: JMG
Analytical Date/Time: 08/31/17 13:25
Container ID: 1176050005-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	0.686		0.490	0.147	mg/L	1		08/31/17 13:25
Surrogates								
n-Triacontane-d62 (surr)	91.6		50-150		%	1		08/31/17 13:25

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Analyst: JMG
Analytical Date/Time: 08/31/17 13:25
Container ID: 1176050005-D

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 08/28/17 08:55
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050005
Lab Project ID: 1176050

Collection Date: 08/24/17 11:35
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500 U		0.100	0.0310	mg/L	1		08/25/17 22:25
Surrogates								
4-Bromofluorobenzene (surr)	92.4		50-150		%	1		08/25/17 22:25

Batch Information

Analytical Batch: VFC13840
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/25/17 22:25
Container ID: 1176050005-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.250 U		0.500	0.150	ug/L	1		08/25/17 22:25
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/25/17 22:25
o-Xylene	0.350 J		1.00	0.310	ug/L	1		08/25/17 22:25
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/25/17 22:25
Toluene	0.500 U		1.00	0.310	ug/L	1		08/25/17 22:25
Surrogates								
1,4-Difluorobenzene (surr)	91		77-115		%	1		08/25/17 22:25

Batch Information

Analytical Batch: VFC13840
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/25/17 22:25
Container ID: 1176050005-A

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/06/2017 1:26:21PM

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050006
Lab Project ID: 1176050

Collection Date: 08/24/17 10:20
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		08/25/17 19:52
Surrogates								
4-Bromofluorobenzene (surr)	90.7		50-150		%	1		08/25/17 19:52

Batch Information

Analytical Batch: VFC13840
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/25/17 19:52
Container ID: 1176050006-C

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 08/25/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050006
Lab Project ID: 1176050

Collection Date: 08/24/17 10:20
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		09/02/17 19:43
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		09/02/17 19:43
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
Benzene	0.200	U	0.400	0.120	ug/L	1		09/02/17 19:43
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
Bromoform	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Bromomethane	2.50	U	5.00	1.50	ug/L	1		09/02/17 19:43
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
Chloroethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050006
Lab Project ID: 1176050

Collection Date: 08/24/17 10:20
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Chloromethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		09/02/17 19:43
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Freon-113	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Methylene chloride	1.08	J	5.00	1.00	ug/L	1		09/02/17 19:43
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
Naphthalene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
o-Xylene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		09/02/17 19:43
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Styrene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Toluene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		09/02/17 19:43
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		09/02/17 19:43
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		09/02/17 19:43
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		09/02/17 19:43
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		09/02/17 19:43
4-Bromofluorobenzene (surr)	109		85-114		%	1		09/02/17 19:43
Toluene-d8 (surr)	95.5		89-112		%	1		09/02/17 19:43

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Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **AKRR Hurricane GW**
Lab Sample ID: 1176050006
Lab Project ID: 1176050

Collection Date: 08/24/17 10:20
Received Date: 08/25/17 09:00
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS17129
Analytical Method: SW8260C
Analyst: FDR
Analytical Date/Time: 09/02/17 19:43
Container ID: 1176050006-A

Prep Batch: VXX31207
Prep Method: SW5030B
Prep Date/Time: 09/02/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1767021 [VXX/31159]
Blank Lab ID: 1408411

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050001, 1176050002, 1176050003, 1176050005, 1176050006

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.000250U	0.000500	0.000150	mg/L
Ethylbenzene	0.000500U	0.00100	0.000310	mg/L
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
o-Xylene	0.000500U	0.00100	0.000310	mg/L
P & M -Xylene	0.00100U	0.00200	0.000620	mg/L
Toluene	0.000500U	0.00100	0.000310	mg/L
Surrogates				
1,4-Difluorobenzene (surr)	92.2	77-115		%
4-Bromofluorobenzene (surr)	95.2	50-150		%

Batch Information

Analytical Batch: VFC13840
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/25/2017 7:32:00PM

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 8/25/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [VXX31159]
Blank Spike Lab ID: 1408412
Date Analyzed: 08/26/2017 00:39

Spike Duplicate ID: LCSD for HBN 1176050 [VXX31159]
Spike Duplicate Lab ID: 1408413
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050001, 1176050002, 1176050003, 1176050005, 1176050006

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.100	0.101	101	0.100	0.103	103	(80-120)	1.60	(< 20)
Ethylbenzene	0.100	0.0999	100	0.100	0.101	101	(75-125)	1.10	(< 20)
o-Xylene	0.100	0.0997	100	0.100	0.0991	99	(80-120)	0.65	(< 20)
P & M -Xylene	0.200	0.200	100	0.200	0.201	100	(75-130)	0.70	(< 20)
Toluene	0.100	0.0981	98	0.100	0.0998	100	(75-120)	1.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	0.0500	98.8	99	0.0500	100	100	(77-115)	1.60	

Batch Information

Analytical Batch: **VFC13840**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX31159**
Prep Method: **SW5030B**
Prep Date/Time: **08/25/2017 08:00**
Spike Init Wt./Vol.: 0.100 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 0.100 mg/L Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [VXX31159]
Blank Spike Lab ID: 1408414
Date Analyzed: 08/26/2017 00:58

Spike Duplicate ID: LCSD for HBN 1176050 [VXX31159]
Spike Duplicate Lab ID: 1408415
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050001, 1176050002, 1176050003, 1176050005, 1176050006

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.04	104	1.00	0.988	99	(60-120)	5.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	99.4	99	0.0500	95.5	96	(50-150)	4.00	

Batch Information

Analytical Batch: **VFC13840**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX31159**
Prep Method: **SW5030B**
Prep Date/Time: **08/25/2017 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1767021 [VXX/31159]
Blank Lab ID: 1408411

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050001, 1176050002, 1176050003, 1176050005, 1176050006

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	92.2	77-115		%

Batch Information

Analytical Batch: VFC13840
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/25/2017 7:32:00PM

Prep Batch: VXX31159
Prep Method: SW5030B
Prep Date/Time: 8/25/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/06/2017 1:26:27PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [VXX31159]
Blank Spike Lab ID: 1408412
Date Analyzed: 08/26/2017 00:39

Spike Duplicate ID: LCSD for HBN 1176050 [VXX31159]
Spike Duplicate Lab ID: 1408413
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050001, 1176050002, 1176050003, 1176050005, 1176050006

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	101	101	100	103	103	(80-120)	1.60	(< 20)
Ethylbenzene	100	99.9	100	100	101	101	(75-125)	1.10	(< 20)
o-Xylene	100	99.7	100	100	99.1	99	(80-120)	0.65	(< 20)
P & M -Xylene	200	200	100	200	201	100	(75-130)	0.70	(< 20)
Toluene	100	98.1	98	100	99.8	100	(75-120)	1.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	98.8	99	50	100	100	(77-115)	1.60	

Batch Information

Analytical Batch: **VFC13840**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX31159**
Prep Method: **SW5030B**
Prep Date/Time: **08/25/2017 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1767466 [VXX/31207]
Blank Lab ID: 1409999

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050004, 1176050006

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

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Method Blank

Blank ID: MB for HBN 1767466 [VXX/31207]
Blank Lab ID: 1409999

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050004, 1176050006

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	105	81-118		%
4-Bromofluorobenzene (surr)	105	85-114		%
Toluene-d8 (surr)	102	89-112		%

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Method Blank

Blank ID: MB for HBN 1767466 [VXX/31207]
Blank Lab ID: 1409999

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050004, 1176050006

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS17129
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: FDR
Analytical Date/Time: 9/2/2017 4:52:00PM

Prep Batch: VXX31207
Prep Method: SW5030B
Prep Date/Time: 9/2/2017 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [VXX31207]
Blank Spike Lab ID: 1410000
Date Analyzed: 09/02/2017 17:45

Spike Duplicate ID: LCSD for HBN 1176050 [VXX31207]
Spike Duplicate Lab ID: 1410001
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050004, 1176050006

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	30.0	100	30	30.2	101	(78-124)	0.46	(< 20)
1,1,1-Trichloroethane	30	29.6	99	30	27.1	90	(74-131)	8.80	(< 20)
1,1,2,2-Tetrachloroethane	30	29.4	98	30	31.6	105	(71-121)	6.90	(< 20)
1,1,2-Trichloroethane	30	30.9	103	30	31.9	106	(80-119)	3.10	(< 20)
1,1-Dichloroethane	30	28.5	95	30	26.4	88	(77-125)	7.50	(< 20)
1,1-Dichloroethene	30	28.4	95	30	26.0	87	(71-131)	9.00	(< 20)
1,1-Dichloropropene	30	30.5	102	30	28.3	95	(79-125)	7.40	(< 20)
1,2,3-Trichlorobenzene	30	28.9	96	30	31.9	106	(69-129)	10.20	(< 20)
1,2,3-Trichloropropane	30	29.1	97	30	32.0	107	(73-122)	9.50	(< 20)
1,2,4-Trichlorobenzene	30	29.6	99	30	30.9	103	(69-130)	4.20	(< 20)
1,2,4-Trimethylbenzene	30	28.5	95	30	28.4	95	(79-124)	0.11	(< 20)
1,2-Dibromo-3-chloropropane	30	29.1	97	30	36.0	120	(62-128)	21.00	* (< 20)
1,2-Dibromoethane	30	29.8	99	30	31.5	105	(77-121)	5.70	(< 20)
1,2-Dichlorobenzene	30	28.8	96	30	28.6	95	(80-119)	0.59	(< 20)
1,2-Dichloroethane	30	27.1	90	30	26.1	87	(73-128)	3.90	(< 20)
1,2-Dichloropropane	30	29.5	98	30	28.2	94	(78-122)	4.60	(< 20)
1,3,5-Trimethylbenzene	30	28.5	95	30	28.7	96	(75-124)	0.56	(< 20)
1,3-Dichlorobenzene	30	28.7	96	30	28.6	95	(80-119)	0.31	(< 20)
1,3-Dichloropropane	30	31.1	104	30	31.5	105	(80-119)	1.40	(< 20)
1,4-Dichlorobenzene	30	29.0	97	30	28.5	95	(79-118)	2.00	(< 20)
2,2-Dichloropropane	30	31.1	104	30	27.9	93	(60-139)	10.70	(< 20)
2-Butanone (MEK)	90	87.2	97	90	117	130	(56-143)	29.40	* (< 20)
2-Chlorotoluene	30	29.5	98	30	28.6	95	(79-122)	3.10	(< 20)
2-Hexanone	90	88.5	98	90	118	131	(57-139)	28.80	* (< 20)
4-Chlorotoluene	30	28.5	95	30	27.7	92	(78-122)	3.00	(< 20)
4-Isopropyltoluene	30	30.2	101	30	29.1	97	(77-127)	3.90	(< 20)
4-Methyl-2-pentanone (MIBK)	90	88.1	98	90	108	120	(67-130)	20.30	* (< 20)
Benzene	30	30.0	100	30	28.5	95	(79-120)	5.00	(< 20)
Bromobenzene	30	27.8	93	30	27.7	92	(80-120)	0.54	(< 20)
Bromochloromethane	30	29.0	97	30	27.3	91	(78-123)	6.00	(< 20)
Bromodichloromethane	30	29.2	97	30	27.6	92	(79-125)	5.70	(< 20)
Bromoform	30	31.2	104	30	33.0	110	(66-130)	5.60	(< 20)
Bromomethane	30	31.2	104	30	25.6	86	(53-141)	19.70	(< 20)
Carbon disulfide	45	42.7	95	45	37.9	84	(64-133)	12.10	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [VXX31207]
Blank Spike Lab ID: 1410000
Date Analyzed: 09/02/2017 17:45

Spike Duplicate ID: LCSD for HBN 1176050 [VXX31207]
Spike Duplicate Lab ID: 1410001
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050004, 1176050006

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	31.1	104	30	28.1	94	(72-136)	10.10	(< 20)
Chlorobenzene	30	29.1	97	30	28.4	95	(82-118)	2.40	(< 20)
Chloroethane	30	27.2	91	30	24.4	81	(60-138)	10.80	(< 20)
Chloroform	30	27.6	92	30	25.8	86	(79-124)	6.90	(< 20)
Chloromethane	30	27.7	92	30	23.9	80	(50-139)	14.50	(< 20)
cis-1,2-Dichloroethene	30	28.1	94	30	26.6	89	(78-123)	5.50	(< 20)
cis-1,3-Dichloropropene	30	30.3	101	30	29.2	97	(75-124)	3.60	(< 20)
Dibromochloromethane	30	31.1	104	30	31.6	105	(74-126)	1.60	(< 20)
Dibromomethane	30	28.2	94	30	27.2	91	(79-123)	3.80	(< 20)
Dichlorodifluoromethane	30	26.5	88	30	23.4	78	(32-152)	12.20	(< 20)
Ethylbenzene	30	30.4	101	30	29.7	99	(79-121)	2.40	(< 20)
Freon-113	45	43.5	97	45	39.9	89	(70-136)	8.70	(< 20)
Hexachlorobutadiene	30	30.8	103	30	28.5	95	(66-134)	7.80	(< 20)
Isopropylbenzene (Cumene)	30	30.3	101	30	29.6	99	(72-131)	2.30	(< 20)
Methylene chloride	30	27.9	93	30	26.4	88	(74-124)	5.60	(< 20)
Methyl-t-butyl ether	45	44.8	100	45	45.7	102	(71-124)	1.90	(< 20)
Naphthalene	30	29.0	97	30	35.2	117	(61-128)	19.50	(< 20)
n-Butylbenzene	30	29.7	99	30	28.4	95	(75-128)	4.40	(< 20)
n-Propylbenzene	30	29.0	97	30	27.6	92	(76-126)	4.70	(< 20)
o-Xylene	30	30.3	101	30	29.7	99	(78-122)	1.90	(< 20)
P & M -Xylene	60	60.6	101	60	58.5	98	(80-121)	3.60	(< 20)
sec-Butylbenzene	30	29.9	100	30	28.2	94	(77-126)	5.90	(< 20)
Styrene	30	30.5	102	30	30.5	102	(78-123)	0.00	(< 20)
tert-Butylbenzene	30	29.3	98	30	27.8	93	(78-124)	5.30	(< 20)
Tetrachloroethene	30	30.0	100	30	29.8	99	(74-129)	0.60	(< 20)
Toluene	30	29.0	97	30	28.3	94	(80-121)	2.40	(< 20)
trans-1,2-Dichloroethene	30	28.6	95	30	26.6	89	(75-124)	7.10	(< 20)
trans-1,3-Dichloropropene	30	28.7	96	30	28.8	96	(73-127)	0.38	(< 20)
Trichloroethene	30	30.0	100	30	28.2	94	(79-123)	6.00	(< 20)
Trichlorofluoromethane	30	29.1	97	30	31.2	104	(65-141)	6.90	(< 20)
Vinyl acetate	30	29.5	99	30	31.2	104	(54-146)	5.40	(< 20)
Vinyl chloride	30	28.6	95	30	24.3	81	(58-137)	16.30	(< 20)
Xylenes (total)	90	90.9	101	90	88.2	98	(79-121)	3.00	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [VXX31207]
Blank Spike Lab ID: 1410000
Date Analyzed: 09/02/2017 17:45

Spike Duplicate ID: LCSD for HBN 1176050 [VXX31207]
Spike Duplicate Lab ID: 1410001
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050004, 1176050006

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	96.6	97	30	93.8	94	(81-118)	2.90	
4-Bromofluorobenzene (surr)	30	92.7	93	30	94.3	94	(85-114)	1.70	
Toluene-d8 (surr)	30	101	101	30	103	103	(89-112)	1.90	

Batch Information

Analytical Batch: **VMS17129**
Analytical Method: **SW8260C**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **FDR**

Prep Batch: **VXX31207**
Prep Method: **SW5030B**
Prep Date/Time: **09/02/2017 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1767018 [XXX/38274]
Blank Lab ID: 1408400

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050004

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.00625U	0.0125	0.00370	ug/L
2-Methylnaphthalene	0.00625U	0.0125	0.00370	ug/L
Acenaphthene	0.00625U	0.0125	0.00370	ug/L
Acenaphthylene	0.00625U	0.0125	0.00370	ug/L
Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo(a)Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo[a]pyrene	0.00250U	0.00500	0.00150	ug/L
Benzo[b]Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Benzo[g,h,i]perylene	0.00625U	0.0125	0.00370	ug/L
Benzo[k]fluoranthene	0.00625U	0.0125	0.00370	ug/L
Chrysene	0.00625U	0.0125	0.00370	ug/L
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	ug/L
Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Fluorene	0.00625U	0.0125	0.00370	ug/L
Indeno[1,2,3-c,d] pyrene	0.00625U	0.0125	0.00370	ug/L
Naphthalene	0.0125U	0.0250	0.00780	ug/L
Phenanthrene	0.0250U	0.0500	0.00370	ug/L
Pyrene	0.0250U	0.0500	0.00370	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	80.4	47-106		%
Fluoranthene-d10 (surr)	79.9	24-116		%

Batch Information

Analytical Batch: XMS10367
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 9/1/2017 4:40:00PM

Prep Batch: XXX38274
Prep Method: SW3520C
Prep Date/Time: 8/26/2017 9:06:12AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [XXX38274]
Blank Spike Lab ID: 1408401
Date Analyzed: 09/01/2017 17:01

Spike Duplicate ID: LCSD for HBN 1176050 [XXX38274]
Spike Duplicate Lab ID: 1408402
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050004

Results by **8270D SIM (PAH)**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	0.5	0.389	78	0.5	0.364	73	(41-115)	6.50	(< 20)
2-Methylnaphthalene	0.5	0.356	71	0.5	0.333	67	(39-114)	6.50	(< 20)
Acenaphthene	0.5	0.478	96	0.5	0.446	89	(48-114)	6.80	(< 20)
Acenaphthylene	0.5	0.386	77	0.5	0.358	72	(35-121)	7.50	(< 20)
Anthracene	0.5	0.409	82	0.5	0.381	76	(53-119)	7.10	(< 20)
Benzo(a)Anthracene	0.5	0.385	77	0.5	0.361	72	(59-120)	6.60	(< 20)
Benzo[a]pyrene	0.5	0.380	76	0.5	0.352	70	(53-120)	7.70	(< 20)
Benzo[b]Fluoranthene	0.5	0.388	78	0.5	0.357	71	(53-126)	8.60	(< 20)
Benzo[g,h,i]perylene	0.5	0.385	77	0.5	0.343	69	(44-128)	11.50	(< 20)
Benzo[k]fluoranthene	0.5	0.392	78	0.5	0.364	73	(54-125)	7.30	(< 20)
Chrysene	0.5	0.412	82	0.5	0.385	77	(57-120)	6.70	(< 20)
Dibenzo[a,h]anthracene	0.5	0.387	78	0.5	0.330	66	(44-131)	16.00	(< 20)
Fluoranthene	0.5	0.388	78	0.5	0.361	72	(58-120)	7.20	(< 20)
Fluorene	0.5	0.402	80	0.5	0.372	74	(50-118)	7.70	(< 20)
Indeno[1,2,3-c,d] pyrene	0.5	0.385	77	0.5	0.347	69	(48-130)	10.30	(< 20)
Naphthalene	0.5	0.371	74	0.5	0.348	70	(43-114)	6.50	(< 20)
Phenanthrene	0.5	0.402	80	0.5	0.373	75	(53-115)	7.60	(< 20)
Pyrene	0.5	0.402	80	0.5	0.375	75	(53-121)	6.90	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	0.5	85.2	85	0.5	79.3	79	(47-106)	7.10	
Fluoranthene-d10 (surr)	0.5	83.1	83	0.5	77.5	78	(24-116)	7.00	

Batch Information

Analytical Batch: **XMS10367**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **DSD**

Prep Batch: **XXX38274**
Prep Method: **SW3520C**
Prep Date/Time: **08/26/2017 09:06**
Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

Print Date: 09/06/2017 1:26:37PM

Method Blank

Blank ID: MB for HBN 1767040 [XXX/38284]
Blank Lab ID: 1408492

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050001, 1176050002, 1176050003, 1176050004, 1176050005

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	76.2	60-120		%

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: JMG
Analytical Date/Time: 8/31/2017 10:59:00AM

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 8/28/2017 8:55:33AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [XXX38284]
Blank Spike Lab ID: 1408493
Date Analyzed: 08/31/2017 11:10

Spike Duplicate ID: LCSD for HBN 1176050 [XXX38284]
Spike Duplicate Lab ID: 1408494
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050001, 1176050002, 1176050003, 1176050004, 1176050005

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	18.7	94	20	18.5	92	(75-125)	1.30	(< 20)
Surrogates									
5a Androstane (surr)	0.4	101	101	0.4	101	101	(60-120)	0.81	

Batch Information

Analytical Batch: **XFC13740**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **JMG**

Prep Batch: **XXX38284**
Prep Method: **SW3520C**
Prep Date/Time: **08/28/2017 08:55**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1767040 [XXX/38284]
Blank Lab ID: 1408492

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176050001, 1176050002, 1176050003, 1176050004, 1176050005

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	0.178J	0.500	0.150	mg/L
Surrogates				
n-Triacontane-d62 (surr)	95.1	60-120		%

Batch Information

Analytical Batch: XFC13740
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: JMG
Analytical Date/Time: 8/31/2017 10:59:00AM

Prep Batch: XXX38284
Prep Method: SW3520C
Prep Date/Time: 8/28/2017 8:55:33AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1176050 [XXX38284]
Blank Spike Lab ID: 1408493
Date Analyzed: 08/31/2017 11:10

Spike Duplicate ID: LCSD for HBN 1176050 [XXX38284]
Spike Duplicate Lab ID: 1408494
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176050001, 1176050002, 1176050003, 1176050004, 1176050005

Results by **AK103**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	20	20.0	100	20	19.4	97	(60-120)	2.90	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	0.4	96.2	96	0.4	96.8	97	(60-120)	0.63	

Batch Information

Analytical Batch: **XFC13740**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **JMG**

Prep Batch: **XXX38284**
Prep Method: **SW3520C**
Prep Date/Time: **08/28/2017 08:55**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

Section 1

CLIENT: Restoration Science & Engineering

CONTACT: Arran Forbes — PHONE #: 278 1023

PROJECT NAME: AKRR Hurricane GW — Project/ PWSID/ PERMIT#:

REPORTS TO: Arran Forbes — E-MAIL: afarbes@restorsci.com

INVOICE TO: Restoration Science & Engineering — per Lucus Gamble (VLP) — QUOTE #: — P.O.#: AKRR Russell Grandel

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Pres: Type: Comp Grab MI (Multi-incre-mental)	Preservative: HCl	HCl	4C								REMARKS/ LOC ID
							GRO/BTEX	DRO/RRO	10CS 8260	PAH 8270							
(1) A-E	RSE-1	08/24/17	1020	Water	5	G	X	X									
(2) A-E	RSE-2		1055	Water	5	G	X	X									
(3) A-E	RSE-3		1130	Water	6	G	X	X									
(4) A-F	RSF-4		1225	Water	5	G		X	X	X							
(5) A-E	RSE-X		1135	Water	5	G	X	X									
(6) A-C	Trip Blank																

Section 5

	Date	Time	
Relinquished By: (1)	8/25/17	0900	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	8/25/17	09:00	Received For Laboratory By:

Section 4

DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 2.4 #D24 or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN (ABSENT)
(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

Hand Delivered

F083-Blank_COC_Templates_2015-03-19

e-Sample Receipt Form

SGS Workorder #: **1176050**

1 1 7 6 0 5 0

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	ABSENT
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 2.4 °C Therm. ID: D24
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	n/a	
If <0°C, were sample containers ice free?	n/a	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	no	BTEX by 8021 per the client.
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	Only 1 PAH container received.
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	yes	Only 3 trip blank vials were received. 2 will be used for VOCs, and 1 will be used for GRO.
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	yes	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Per LG, bill to AKRR/Russell Grandel 8/25/17 VLP

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1176050001-A	HCL to pH < 2	OK			
1176050001-B	HCL to pH < 2	OK			
1176050001-C	HCL to pH < 2	OK			
1176050001-D	HCL to pH < 2	OK			
1176050001-E	HCL to pH < 2	OK			
1176050002-A	HCL to pH < 2	OK			
1176050002-B	HCL to pH < 2	OK			
1176050002-C	HCL to pH < 2	OK			
1176050002-D	HCL to pH < 2	OK			
1176050002-E	HCL to pH < 2	OK			
1176050003-A	HCL to pH < 2	OK			
1176050003-B	HCL to pH < 2	OK			
1176050003-C	HCL to pH < 2	OK			
1176050003-D	HCL to pH < 2	OK			
1176050003-E	HCL to pH < 2	OK			
1176050004-A	HCL to pH < 2	OK			
1176050004-B	HCL to pH < 2	OK			
1176050004-C	HCL to pH < 2	OK			
1176050004-D	HCL to pH < 2	OK			
1176050004-E	HCL to pH < 2	OK			
1176050004-F	No Preservative Required	OK			
1176050005-A	HCL to pH < 2	OK			
1176050005-B	HCL to pH < 2	OK			
1176050005-C	HCL to pH < 2	OK			
1176050005-D	HCL to pH < 2	OK			
1176050005-E	HCL to pH < 2	OK			
1176050006-A	HCL to pH < 2	OK			
1176050006-B	HCL to pH < 2	OK			
1176050006-C	HCL to pH < 2	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM- The container was received damaged.
FR- The container was received frozen and not usable for Bacteria or BOD analyses.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

ATTACHMENT F

Field Notes

RSE GROUNDWATER SAMPLING FORM **DATE:** 8/24/17 **WEATHER:** Overcast, raining

PROJECT NAME: ABC Hurricane **SITE LOCATION:** Hurricane **SAMPLER:** ACE
PROJECT NO.: **WELL NUMBER:** RSE-1 **COMPANY:** RSE
CONTACT #: 278 1023

WATER COLUMN INFORMATION

A) TOTAL DEPTH OF WELL (FT): 7.71

B) DEPTH TO WATER FROM TOC (FT): 3.79

C) COLUMN OF WATER IN WELL (FT): 3.92
*row "A" value minus row "B" value

WELL LOCATION MAP AND SURVEY

See map. RSE-1 adj to station house. well cover in excellent condition.

PURGE INFORMATION

1-in = XX GAL/FT
2-IN = 0.17 GAL/FT

PURGE METHOD: Submersible

D) GALLONS PER FOOT OF 2-INCH SCREEN: 0.17

*e.g. peristaltic or bladder pump, Bailer

E) COLUMN OF WATER IN WELL (FT): 3.92
*value from row "C" in previous section

F) VOLUME OF WATER IN WELL (GAL): 0.67
*row "D" value multiplied by row "E" value

TOTAL VOLUME REMOVED (GAL): 2.8

WATER OBSERVATIONS

light brown, clear
no sheen, no odor observed

WATER LEVEL AND FIELD PARAMETERS

INSTRUMENT:
*e.g. YSI 63, YSI 556, other

TIME	DTW	DRAW-DOWN (-) / RECHARGE (+)	GALLONS REMOVED	TEMP. (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SP. CONDUCTANCE (mS/cm)	SALINITY (ppt)	TURBIDITY (NTU)	O_2 (mg/L)	REDOX (mV)
1010	3.79		0.7	9.3	5.84	20.9	14.3	0.0			
1012	3.85		0.7	7.5	6.04	27.3	19.2	0.0			
1014	3.98		0.7	7.1	6.06	33.0	50.3	0.0			
1016	4.02		0.7	7.0	6.03	33.1	50.7	0.0			

Odor or Sheen Observed? none

Notes: First well volume outlier reading, subsequent 3 showed stability

SAMPLE INFORMATION (Also See Lab COC)

SAMPLE ID	DATE:	TIME	SAMPLER
RSE-1	8/24/17	1020	ACE

SAMPLE ID: RSE-1

FIELD DUPLICATE: no

EQUIPMENT BLANK: no

TRIP BLANK: yes

LAB ANALYSIS REQUESTED:

DRO GRO BTEX

COMMENTS:

RSE GROUNDWATER SAMPLING FORM **DATE:** 8/24/17 **WEATHER:** overcast, raining

PROJECT NAME: AREC Hurricane **SITE LOCATION:** Hurricane **SAMPLER:** ACF
PROJECT NO.: **WELL NUMBER:** RSE-2 **COMPANY:** RSE
CONTACT #: 278 1023

WATER COLUMN INFORMATION
A) TOTAL DEPTH OF WELL (FT): 7.58
B) DEPTH TO WATER FROM TOC (FT): 3.71
C) COLUMN OF WATER IN WELL (FT): ~~3.87~~ (3.87)
*row "A" value minus row "B" value

WELL LOCATION MAP AND SURVEY
See map
interior well casing flooded w/ water

PURGE INFORMATION 1-in = XX GAL/FT 2-IN = 0.17 GAL/FT PURGE METHOD: submersible
D) GALLONS PER FOOT OF 2-INCH SCREEN: .17
E) COLUMN OF WATER IN WELL (FT): 3.87
*value from row "C" in previous section
F) VOLUME OF WATER IN WELL (GAL): .7
*row "D" value multiplied by row "E" value
TOTAL VOLUME REMOVED (GAL): 1.4
*e.g. peristaltic or bladder pump, Bailer

WATER OBSERVATIONS
turbid, murky
no sheen or odor observed

WATER LEVEL AND FIELD PARAMETERS
INSTRUMENT:
*e.g. YSI 63, YSI 556, other

TIME	DTW	DRAW-DOWN (-) / RECHARGE (+)	GALLONS REMOVED	TEMP. (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SP. CONDUCTANCE (mS/cm)	SALINITY (ppt)	TURBIDITY (NTU)	O_2 (mg/L)	REDOX (mV)
1040	3.71		.7	9.7	6.3	1.7	3.1	0.0			
1042	7.58		.7	9.3	5.97	1.5	2.5	0.0			

Odor or Sheen Observed? none
Notes: well dry after 2 volumes

SAMPLE INFORMATION (Also See Lab COC)

SAMPLE ID	DATE:	TIME	SAMPLER
~~1055~~ RSE-2	8/24/17	1055	ACF

SAMPLE ID: RSE-2
FIELD DUPLICATE: no
EQUIPMENT BLANK: no
TRIP BLANK: yes

LAB ANALYSIS REQUESTED:
DRO RRO GRO BTEX

COMMENTS:
well dry after 2 volumes purged but parameters collected were consistent about 10 minutes to recharge for sampling.

RSE GROUNDWATER SAMPLING FORM **DATE:** 8/24/17 **WEATHER:** overcast, raining

PROJECT NAME: ADEC Hurricane **SITE LOCATION:** ~~RSE~~ Hurricane **SAMPLER:** ACF
PROJECT NO.: **WELL NUMBER:** RSE-3 **COMPANY:** RSE
CONTACT #: 248-1081

WATER COLUMN INFORMATION

A) TOTAL DEPTH OF WELL (FT): 7.66

B) DEPTH TO WATER FROM TOC (FT): 3.41

C) COLUMN OF WATER IN WELL (FT): 4.25
*row "A" value minus row "B" value

WELL LOCATION MAP AND SURVEY

SCI map.
casing is frost-jacked, intact in good condition

PURGE INFORMATION

1-in = XX GAL/FT
2-IN = 0.17 GAL/FT

PURGE METHOD: Submersible
*e.g. peristaltic or bladder pump, Bailer

D) GALLONS PER FOOT OF 2-INCH SCREEN: .17

E) COLUMN OF WATER IN WELL (FT): 4.25
*value from row "C" in previous section

F) VOLUME OF WATER IN WELL (GAL): .8
*row "D" value multiplied by row "E" value

TOTAL VOLUME REMOVED (GAL): 3.2

WATER OBSERVATIONS

Very turbid. Dark brown, opaque
no sheen. No odor
Turbidity improved with purging

WATER LEVEL AND FIELD PARAMETERS

INSTRUMENT:
*e.g. YSI 63, YSI 556, other

TIME	DTW	DRAW-DOWN (-) / RECHARGE (+)	GALLONS REMOVED	TEMP. (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SP. CONDUCTANCE (mS/cm)	SALINITY (ppt)	TURBIDITY (NTU)	O_2 (mg/L)	REDOX (mV)
1105	3.41		.8	8.7	6.22	157.7	228.3	0.1			
1110	4.05		.8	8.5	5.99	90.5	130.2	0.1			
1115	5.06		.8	8.7	5.90	81.7	118.6	.1			
1120	5.97		.8	8.8	5.89	80.9	117.3	.1			

Odor or Sheen Observed? None
Notes:

SAMPLE INFORMATION (Also See Lab COC)

SAMPLE ID	DATE:	TIME	SAMPLER
RSE-3	8/24/17	1130	ACF
RSE-X		1135	

SAMPLE ID: RSE-3
FIELD DUPLICATE: yes
EQUIPMENT BLANK: no
TRIP BLANK: yes

LAB ANALYSIS REQUESTED:

DRO RRO GRO ~~VOCs~~ ~~PAH~~ BTEX
duplicate for DRO RRO GRO BTEX
Note: changed submittal for analytes following sampling at RSE-4 as this appeared more impacted.

COMMENTS:

Extra bottles included for volatile analysis. Turbidity made difficult to reduce bubbles.

RSE GROUNDWATER SAMPLING FORM **DATE:** 8/24 **WEATHER:** overcast, light rain

PROJECT NAME: ARRC Hurricane **SITE LOCATION:** Hurricane **SAMPLER:** ACT
PROJECT NO.: **WELL NUMBER:** RSE-4 **COMPANY:** RSE
CONTACT #: 278-1027

WATER COLUMN INFORMATION

A) TOTAL DEPTH OF WELL (FT): 0.8

B) DEPTH TO WATER FROM TOC (FT): 7.00

C) COLUMN OF WATER IN WELL (FT): 6.72
*row "A" value minus row "B" value

WELL LOCATION MAP AND SURVEY

See map.
Mag-locator required to locate well in gravel / vegetation

PURGE INFORMATION

1-in = XX GAL/FT
2-IN = 0.17 GAL/FT

D) GALLONS PER FOOT OF 2-INCH SCREEN: .17

E) COLUMN OF WATER IN WELL (FT): 6.72
*value from row "C" in previous section

F) VOLUME OF WATER IN WELL (GAL): 1.1
*row "D" value multiplied by row "E" value

TOTAL VOLUME REMOVED (GAL): 4

PURGE METHOD: Submersible
*e.g. peristaltic or bladder pump, Bailer

WATER OBSERVATIONS

gray, dark, turbid
very slight potential sheen, difficult to confirm in conditions (rain, low light)

WATER LEVEL AND FIELD PARAMETERS

INSTRUMENT:
*e.g. YSI 63, YSI 556, other

TIME	DTW	DRAW-DOWN (-) / RECHARGE (+)	GALLONS REMOVED	TEMP. (°C)	pH (pH Units)	CONDUCTIVITY (mS/cm)	SP. CONDUCTANCE (mS/cm)	SALINITY (ppt)	TURBIDITY (NTU)	O_2 (mg/L)	REDOX (mV)
1210	6.54		1.0	8.4	6.28	74.7	83.7	0.0			
1215	4.50		1.0	8.9	6.23	70.3	102.3	0.0			
1218	3.11		1.0	8.7	6.21	85.5	111.7	0.0			
1220	1.14		1.0	8.7	6.21	84.7	103.0	0.0			

Odor or Sheen Observed?
Notes: See below

SAMPLE INFORMATION (Also See Lab COC)

SAMPLE ID	DATE:	TIME	SAMPLER
RSE-4	8/24/17	1225	ACT

SAMPLE ID: RSE-4
FIELD DUPLICATE: no
EQUIPMENT BLANK: no
TRIP BLANK: yes

LAB ANALYSIS REQUESTED:
DRO GRO BTEX

COMMENTS:

extremely productive well, rapid recharge
Sheen only on first volume. Submit for PAH/full list VOC- in lieu of RSE-3 as this one appears to have greater impacts.

Note: purge water let off HC odor while pouring into bigger bucket for containment.

	Set 1	Set 2	Set 3	Set 4
TBM1	4.15	4.13	4.29	4.20
4	8.08	8.06	8.20	8.13
3	5.42	5.40	5.56	5.47
2	4.63	4.62	4.78	4.69
1	4.60	4.58	4.75	4.66
TBM2	4.15	4.13	4.29	4.20

TBM= NW corner electrical box

DTW:

RSE-1	RSE-2	RSE-3	RSE-4
3.79	3.71	3.41	0.8
3.81	3.68	3.37	0.8
3.81	3.69	3.36	0.8
3.80	3.69	3.39	0.8

↑ below deamal tape (above), shallow GW

8/24/17
1300
A Folbe
R Grandell