

**FES**

3538 International Street  
Fairbanks, Alaska 99701

Phone: (907) 452-1006  
FAX: (907) 452-2692  
Email: FES@Alaska.com

---

**FAIRBANKS ENVIRONMENTAL SERVICES**

DATE: January 14, 2015

TO: Mr. Russell Grandel, Alaska Railroad Corporation

FROM: Michael Boese, Fairbanks Environmental Services

RE: 2014 Groundwater Monitoring Report (Rev 1)  
Fairbanks Rail Yard  
Fairbanks, Alaska  
ADEC Hazard ID – 327 / File ID – 102.38.050

## EXECUTIVE SUMMARY

On August 26, 2014, six monitoring wells were sampled by Fairbanks Environmental Services (FES) to evaluate current groundwater conditions at the Alaska Railroad Corporation (ARRC) Fairbanks Rail Yard site. A product thickness of 0.01 foot was measured in WC-3 and a product thickness of 0.33 foot was measured in MW-2; consequently, neither of these source area wells was sampled. Groundwater levels were approximately 3 feet higher in August 2014 than during previous sampling events in September 2012 and June 2013. Inferred groundwater flow during this monitoring event was predominately to the west, whereas the previous flow direction was more to the southwest.

Groundwater samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), gasoline range organics (GRO), diesel range organics (DRO), and residual range organics (RRO). Analytical results from samples collected from wells MW-4, MW-6, and MW-7 (located southwest of the source area) exceeded the ADEC Table C cleanup level for DRO. In addition, well MW-6 exceeded the ADEC cleanup level for RRO.

The DRO/RRO plume is bounded to the west-southwest and south by wells MW-5, MW-8, and MW-9; results for samples collected from these wells were below cleanup levels. However, this is the first time the DRO concentration was below the cleanup level in well MW-5. Annual groundwater sampling and water level measurements are recommended to further evaluate site conditions.

## 1.0 INTRODUCTION

### 1.1 Site Description and History

The ARRC Fairbanks Rail Yard is located off of Phillips Field Road in Fairbanks, Alaska (Figure 1). The Fairbanks Rail Yard is a primary facility for northern ARRC operations. Site improvements include buried utilities, rail yard lighting, and multiple sets of railroad tracks, track crossings, and buildings. The site is underlain by a shallow unconfined aquifer.

Between 1949 and 1986, ARRC operated two 2,500-barrel diesel above ground storage tanks (ASTs), which served to provide fuel for locomotives and ARRC equipment. The AST system was taken out of service in 1988. In 2003, The ASTs were subsequently dismantled and removed from the site (Hart Crowser, 2004).

## 1.2 Previous Investigations

In 1986, a seven foot deep test pit was excavated between the two ASTs. ARRC observed four feet of diesel product on the surface of the water table (ADEC Contaminated Sites Database). Below is a summary of investigations performed at this site.

### Summary of Previous Investigations

Year	Action	Description
1988	Soil Gas Survey	A soil-gas survey was conducted to determine petroleum hydrocarbon impacts to the soil and groundwater. The results of the survey indicated a potential impacted subsurface area 400 feet long and 24 feet wide (Woodward-Clyde Consultants, 1988).
1988	Well Installation	Two 4-inch monitoring wells (WC-1 and WC-2), and one 8-inch monitoring well (WC-3) were installed at the Fairbanks Rail Yard. The wells were screened between 15 and 30 feet below ground surface (bgs). Free-phase product was observed in WC-2 and WC-3 at that time.
2003	Soil Boring and Well Installation	A soil and groundwater site investigation included advancing four soil borings that were completed as monitoring wells (MW-1, MW-2, MW-3, and MW-4). Free-phase hydrocarbons were measured in MW-1, MW-2, and MW-4. Subsurface observations indicated the presence of petroleum hydrocarbons throughout the vadose and smear zones near the ASTs. Petroleum hydrocarbons in soil from outlying borings (MW-2 and MW-4) were encountered only in the smear zone, thus indicating transport of the fuel by groundwater (Hart Crowser, 2004).
2005, 2006	Well Installation and Groundwater Monitoring	Wells MW-5 and MW-6 were installed to evaluate groundwater conditions downgradient of the existing well network (Hart Crowser, 2005). Samples from the newly installed wells exceeded cleanup levels for DRO and/or benzene. Free-phase product was consistently noted in well WC-3, and periodically in wells MW-1 and MW-2 (Hart Crowser, 2006).
2010	Groundwater Monitoring	Results from this event indicate that product was measured in wells product was measured in wells MW-1 and WC-3 and that petroleum hydrocarbon concentrations including benzene, GRO, DRO, and RRO remain above applicable cleanup levels in several wells at the site (Clarus, 2010).
2011	Well Installation and Groundwater Monitoring	Monitoring well MW-7 was installed to replace WC-2. In addition to the free-phase product in WC-3 and MW-2, DRO and benzene concentrations exceeded ADEC groundwater cleanup levels in the sample from well MW-1 (Restoration Science & Engineering, LLC., 2011).
2012	Well Installation and Groundwater Monitoring	Monitoring wells MW-8 and MW-9 were installed to delineate the southern (downgradient) extent of the plume. Free-phase product was measured in WC-3. Sample results indicate that DRO exceeded the ADEC groundwater cleanup level in all wells, except the two newly installed wells furthest downgradient. In addition, RRO exceeded the cleanup level in samples collected from wells MW-1, MW-2, and MW-7, and benzene exceeded the cleanup level in samples from MW-2 and MW-6 (FES, 2012).
2013	Groundwater Monitoring	Free-phase product was measured in WC-3. Sample results indicate that DRO concentrations exceeded the ADEC groundwater cleanup level in all wells sampled except MW-8 and MW-9. In addition, RRO concentrations exceeded the cleanup level in samples from MW-2 and MW-7, and benzene exceeded the cleanup level in samples from MW-2 and MW-6 (FES, 2013). Well MW-1 was found to be damaged and was not sampled.

## 2.0 GROUNDWATER SAMPLE COLLECTION

Field work was performed in accordance with the ADEC approved Work Plan (FES, 2014). Vanessa Ritchie, a FES employee and ADEC qualified person, performed groundwater sampling services.

Six monitoring wells (MW-4, MW-5, MW-6, MW-7, MW-8, and MW-9) were sampled on August 26, 2014. A field duplicate sample (MW-X) was collected from MW-7. Wells MW-2 and WC-3 contained floating product and were not sampled. Well MW-1 was found to be damaged during 2013 and well MW-3 hasn't been located since 2010. Well locations are shown on Figure 2.

Prior to sampling, the depth to water was measured in each of the wells. The depths were measured to within 0.01 foot from the top of the well casings using an oil/water interface probe. The wells were purged and sampled with new disposable tubing and a peristaltic pump using a low-flow technique. Tubing intake was set approximately 1 foot below the top of the water column. Groundwater parameters were collected with a YSI Model 556 multi-parameter instrument equipped with a flow through cell. Turbidity readings were measured with an HF Scientific MicroTPW turbidimeter. Analytical samples were collected after water quality parameters had stabilized per the requirements in ADEC's field sampling guidance (ADEC, 2010). Groundwater samples were collected by disconnecting the flow through cell and pumping directly into sample containers at a low-flow rate to minimize sample aeration.

Water samples were placed in a cooler containing frozen gel ice and maintained at 4 degrees Celsius. Samples were submitted to SGS North America (SGS) in Fairbanks, Alaska and transferred to SGS's facility in Anchorage for analysis. Samples were analyzed for BTEX, GRO, DRO, and RRO using methods SW8021B, AK101, AK102, and AK103, respectively. A trip blank accompanied project samples to the laboratory and was analyzed for BTEX and GRO.

## 3.0 GROUNDWATER RESULTS

Depth to groundwater observed at the site on August 26, 2014 varied between approximately 10.5 feet and 12.8 feet bgs, which is approximately 3 feet higher than water levels measured during previous sampling events in September 2012 and June 2013. A total of 0.33 foot and 0.01 foot of floating product was identified in MW-2 and WC-3, respectively. Neither of the wells with product was sampled.

Relative groundwater elevations were used to determine flow direction. Groundwater contours are displayed in Figure 2; inferred groundwater flow is fairly flat but, overall, trends to the west with a gradient of approximately 0.0004. Note that the elevation from MW-2 was not used to contour due to the thickness of product observed in the well. Previous water level data indicate a similarly flat gradient but a flow to the southwest (Clarus, 2010; Restoration Science and Engineering, 2011; FES, 2012 and 2013).

Laboratory results from samples collected from wells MW-4, MW-6, and MW-7 exceeded the ADEC Table C cleanup level for DRO. In addition, the sample from MW-6 also exceeded the ADEC cleanup level for RRO. These results are consistent with historical data. Groundwater field parameters and laboratory results for 2014 groundwater samples are summarized in Tables 1 and 2, respectively. For comparison, historical groundwater data are included as Table 3. A copy of the laboratory report is included as Appendix A.

The DRO/RRO plume is bounded to the west-southwest and south by wells MW-5, MW-8, and MW-9; results from these wells were below cleanup levels. However, this is the first time the DRO concentration was below the cleanup level in well MW-5.

#### 4.0 INVESTIGATION-DERIVED WASTE

A minimal amount of investigation-derived waste was generated during the sampling effort. Approximately 15 gallons of purge water obtained from monitoring well sampling activities was transferred to ARRC's oil water separator located on site in the Car Shop and Roundhouse.

#### 5.0 DATA QUALITY SUMMARY

Samples were collected and analyzed in accordance with the approved Work Plan (FES, 2014). All project samples were analyzed by SGS of Anchorage, Alaska. The laboratory is approved by the State of Alaska through the Contaminated Sites Program for the contaminant methods employed. All samples were shipped in a single sample data group and assigned the SGS report number 1144143. A copy of the report is included as Appendix A.

The chemical data were evaluated in order to assess whether they met data quality objectives and were acceptable for project use. The findings of the review are documented in the ADEC Laboratory Data Review Checklist, which is included in Appendix B. Overall, the review process deemed the groundwater data acceptable for project use. No data were rejected pursuant to FES's data quality review, and all data may be used, as qualified, for project purposes. The following data quality issues were identified:

- DRO was detected in the method blank at a concentration of 0.213 J mg/L. Consequently, DRO results from MW-4 and MW-5 were qualified with a B because they were within 10 times the method blank concentration. Impact to sample MW-4 is notable since the DRO concentration was just above the ADEC cleanup level. However, samples from this well have historically exceeded the DRO cleanup level, so there is likely no impact. The DRO concentration in MW-5 was nearly an order of magnitude below the cleanup level and therefore any impact to data would be minor.
- RRO concentrations in field duplicate samples MW-7/MW-X did not meet the ADEC comparison criterion of 30%. The variance in RRO concentrations in these samples is likely due to high contaminant concentrations (above solubility limits and ADEC groundwater cleanup levels). Impact to data quality is minor as the RRO results for both the primary and field duplicate sample were below the ADEC cleanup level.

#### 6.0 CONCLUSION AND RECOMMENDATIONS

The predominant groundwater flow direction during the September 2014 sampling event was to the west with a flat gradient; inferred flow direction during previous events was to the southwest. The variation in flow direction may be the result of a high water table. Water levels measured in September 2014 were approximately 3 feet higher than water levels in September 2012 and June 2013.

Free-phase product was observed in source area wells MW-2 and WC-3. Petroleum hydrocarbons, particularly DRO and RRO, still exceed applicable ADEC groundwater cleanup levels in several wells at the

site. The DRO/RRO plume is bounded to the west-southwest and south by wells MW-5, MW-8, and MW-9; results for samples collected from these wells were below cleanup levels. However, this is the first time the DRO concentration was below the cleanup level in well MW-5, and while the decreasing DRO concentration trend in MW-5 is consistent with historical results, the large magnitude of the decrease may be due, in part, to the high water table.

FES recommends continued periodic groundwater monitoring and another round of water level measurements at the ARRC Fairbanks Rail Yard. The high water table and change in groundwater flow direction should be noted.

## 7.0 REFERENCES

- Alaska Department of Environmental Conservation (ADEC), 2012. *Oil and Other Hazardous Substances Pollution Control, 18 AAC 75*. April 8.
- ADEC, 2010. *Draft Field Sampling Guidance*. May.
- Clarus Technologies, 2010. *Groundwater Monitoring Report, Fairbanks Rail Yard, Fairbanks, Alaska*. October.
- Fairbanks Environmental Services (FES), 2014. *2014 Groundwater Monitoring Work Plan, Fairbanks Rail Yard, Fairbanks, Alaska*. June 3.
- FES, 2013. *Groundwater Monitoring Report, Fairbanks Rail Yard, Fairbanks, Alaska*. June 29.
- FES, 2012. *Groundwater Monitoring Report, Fairbanks Rail Yard, Fairbanks, AK*. November 26.
- Hart Crowser, 2006. *Groundwater Sampling at the Fairbanks Rail Yard, Fairbanks, Alaska*. November.
- Hart Crowser, 2005. *Fairbanks Rail Yard, Soil and Groundwater Assessment Report, Fairbanks, Alaska*. December.
- Hart Crowser, 2004. *Diesel Tanks and Sand Tower Dismantling, Soil and Groundwater Assessment Report, Alaska Railroad Yard, Fairbanks, Alaska*. May.
- Restoration Science & Engineering, LLC., 2011. *Site Characterization Report, Alaska Railroad Corporation, ARRC Fairbanks Rail Yard, Fairbanks, Alaska*. December.
- Woodward-Clyde Consultants, 1988. *Fairbanks Fuel Facility, Fairbanks, Alaska*. July 29.

## Attachments

Table 1 – 2014 Field Parameters  
Table 2 – 2014 Groundwater Results  
Table 3 – Historical Groundwater Data

Figure 1 – Vicinity Map  
Figure 2 – Site Map

Appendix A – Laboratory Report 1144143  
Appendix B – ADEC Laboratory Review Checklist

**Table 1 - 2014 Field Parameters**  
**Fairbanks Rail Yard**

Well	Date	Sheen or Odor?	Depth to Groundwater (feet BTOC) <sup>1</sup>	Well Drawdown (feet)	Temperature (Degrees Celsius)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	Potential (mV)	Turbidity (NTU)
MW-2	8/26/14	Free-Phase Product	12.45 <sup>2</sup>	Not sampled, well contained 0.33 foot of floating product						
MW-4	8/26/14	Slight Sheen and Odor	12.77	0.01	6.84	1.046	0.72	5.94	-34.9	2.44
MW-5	8/26/14	None	12.14	0.01	7.78	1.222	0.54	6.45	147.3	5.92
MW-6	8/26/14	Slight Sheen and Odor	11.97	0.02	6.48	1.056	0.48	6.15	-35.2	5.11
MW-7	8/26/14	Strong Odor	11.79	0.02	8.02	0.987	0.44	6.44	88.4	26.96
MW-8	8/26/14	None	10.45	0.02	6.12	2.077	4.81	6.25	88.3	2.19
MW-9	8/26/14	None	10.88	0.07	6.79	1.708	0.61	6.45	100.2	2.33
WC-3	8/26/14	Free-Phase Product	12.62 <sup>3</sup>	Not sampled, well contained 0.01 foot of floating product						

<sup>1</sup> - Water levels were all measured on 8/26/2014, prior to purging aquifer

<sup>2</sup> - Depth to product was 12.12 feet and depth to water was 12.45 feet

<sup>3</sup> - Depth to product was 12.61 feet and depth to water was 12.62 feet

BTOC - below top of casing

mS/cm - milliSiemens per centimeter

mV - millivolts

NTU - nephelometric turbidity units

**Table 2 - 2014 Groundwater Results  
Fairbanks Rail Yard**

Location			Cleanup Level <sup>1</sup>	MW-4	MW-5	MW-6	MW-7		MW-8	MW-9	Trip Blank
Sample ID				MW-4	MW-5	MW-6	MW-7	MW-X	MW-8	MW-9	Trip Blank
Laboratory				SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA	SGSA
Lab Sample ID				1144143001	1144143002	1144143005	1144143003	1144143004	1144143007	1144143006	1144143008
Collect Date				8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014	8/26/2014
Matrix				WG	WG	WG	WG	WG	WG	WG	WG
Sample Type				Primary	Primary	Primary	Primary	Field Duplicate	Primary	Primary	Trip Blank
Analyte	Method	Units			Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier	Result [LOD] Qualifier
Gasoline Range Organics	AK101	mg/L	2.2	0.251	ND (0.05)	0.168	0.0473 J	0.0508 J	ND (0.05)	ND (0.05)	ND (0.05)
Diesel Range Organics	AK102	mg/L	1.5	1.80 B	0.225 J,B	6.94	6.05	6.73	ND (0.300)	ND (0.302)	-
Residual Range Organics	AK103	mg/L	1.1	ND (0.250)	ND (0.254)	1.41	ND (0.272)	1.05	ND (0.250)	ND (0.252)	-
Benzene	SW8021B	µg/L	5	ND (0.25)	ND (0.25)	4.34	0.330 J	0.310 J	ND (0.25)	ND (0.25)	ND (0.25)
Ethylbenzene	SW8021B	µg/L	1,000	6.35	ND (0.5)	4.03	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Toluene	SW8021B	µg/L	700	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylene, Isomers m,p	SW8021B	µg/L	10,000	12.7	ND (1.0)	11.5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
o-Xylene	SW8021B	µg/L	(total)	5.53	ND (0.5)	6.78	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Results in **bold** and yellow highlight exceed the cleanup level

<sup>1</sup> - Groundwater cleanup levels are from Table C, 18 AAC 75.345

B - Analyte was also detected in a blank at a similar concentration; result may be from cross contamination

J - Result is estimated because it was reported below the LOQ

LOD - Limit of Detection

LOQ - Limit of Quantitation

µg/L - micrograms per liter

mg/L - milligrams per liter

ND - Analyte was not detected at the Detection Limit

**Table 3 - Historical Groundwater Results  
Fairbanks Rail Yard**

Well Number	Sample Date	AK101	AK102	AK103	EPA Method SW8021B			
		GRO (mg/L)	DRO (mg/L)	RRO (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)
ADEC Groundwater Cleanup Level		2.2	1.5	1.1	0.005	1.0	0.7	10
MW-1	Nov-03	not sampled due to 0.05 feet of floating product						
	Sep-04	not sampled due to 0.02 feet of floating product						
	Sep-06	0.87/	123	4.23	0.0049	0.0015	0.0087	0.292
	Sep-10	not sampled due to 0.06 feet of floating product						
	Sep-11	0.839	99.5	-	0.00527	0.00472	0.0107	0.343
	Sep-12	1.06	69.5	4.38	0.00423	0.00423	0.00815	0.288
	Jun-13	not sampled after 2012 due to broken well casing						
MW-2	Nov-03	not sampled due to 0.14 feet of floating product						
	Sept 04 & 06	not sampled due to 0.08 feet of floating product						
	Sep-10	0.234 J	187	6.81	0.0088	0.00103 J	0.00603	0.0302 J
	Sep-11	not sampled due to floating product						
	Sep-12	0.377	19.5	2.08	0.0187	0.0004 J	0.0097	0.0449
	Jun-13	0.384	19.9	2.11	0.0239	0.0003 J	0.00559	0.02702
	Aug-14	not sampled due to 0.33 feet of floating product						
MW-3	Nov-03	NA	5.30	NA	ND (0.00015)	ND (0.00024)	0.0010	0.0071
	Sep-04	ND (0.080)	2.71	0.992	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0005)
	Sep-06	ND (0.05)	0.94	0.43	ND (0.0010)	ND (0.0010)	ND (0.0010)	ND (0.0020)
	Sep-10	ND (0.05)	ND (0.40)	ND (0.40)	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-11	well could not be located in 2011, 2012, 2013, and 2014						
MW-4	Nov-03	not sampled due to 0.03 feet of floating product						
	Sep-04	0.354	6.07 J	ND (0.48)	ND (0.0005)	ND (0.0005)	0.0073	0.0162
	Sep-06	0.17	18.5	0.58	ND (0.0010)	ND (0.0010)	0.0094	0.023
	Sep-10	1.48	43.0	0.484	ND (0.0005)	0.00434	0.0174	0.124 J
	Sep-11	0.0854 J	3.37	-	0.00018 J	0.0005 J	0.00928	0.0271
	Sep-12	0.278	3.82	0.4 J	0.00043 J	ND (0.00062)	0.0113	0.0339
	Jun-13	0.244	9.39	1.00	0.000250 J	ND (0.00062)	0.00822	0.0226
	Aug-14	0.251	1.8 B	ND (0.250)	ND (0.00025)	ND (0.0005)	0.00635	0.0182
MW-5	Sep-04	0.228	4.21	ND (0.48)	ND (0.0005)	ND (0.0005)	0.0032	0.0039
	Sep-06	0.06	3.44	ND (0.40)	ND (0.0010)	ND (0.0010)	0.0022	0.0020
	Sep-10	well could not be located in September 2010 or 2011						
	Sep-12	0.0716	3.14	0.431 J	0.00111	ND (0.00062)	0.00229	0.00312
	Jun-13	0.0459 J	1.61	0.484 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00124)
	Aug-14	ND (0.05)	0.225 J,B	ND (0.254)	ND (0.00025)	ND (0.0005)	ND (0.0005)	ND (0.0015)
MW-6	Sep-06	0.30	11.2	0.90	0.0076	ND (0.0020)	0.0155	0.0590
	Sep-10	0.172 J	12.7	0.636	0.00367	0.000838 J	0.00926	0.0382 J
	Sep-11	0.105	118	-	0.00418	0.000340 J	0.00418	0.0185
	Sep-12	0.479	8.36	1.09	0.00951	0.00039 J	0.0233	0.105
	Jun-13	0.225	5.46	0.813	0.00577	ND (0.00062)	0.00486	0.0186
	Aug-14	ND (0.05)	0.225 J	ND (0.254)	0.00434	ND (0.0005)	0.00403	0.0183
	Sep-11	0.0854 J	19.6	-	0.00107	ND (0.001)	0.00048 J	0.00352
MW-7	Sep-12	0.0937	12.4	1.85	0.0012	ND (0.00062)	0.0005 J	0.00139 J
	Jun-13	0.114	10.5	1.46	0.00126	0.00071 J	0.000390 J	0.0017 J
	Aug-14	0.0508 J	6.73	1.05	0.00033 J	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-12	ND (0.062)	0.288 J	0.339 J	ND (0.0003)	0.00031 J	0.00035 J	ND (0.00186)
MW-8	Jun-13	ND (0.062)	ND (0.368)	0.267 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
	Aug-14	ND (0.05)	ND (0.300)	ND (0.250)	ND (0.00025)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-12	ND (0.062)	0.189 J	0.199 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
MW-9	Jun-13	ND (0.062)	ND (0.382)	0.165 J	ND (0.0003)	ND (0.00062)	ND (0.00062)	ND (0.00186)
	Aug-14	ND (0.05)	ND (0.302)	ND (0.252)	ND (0.00025)	ND (0.0005)	ND (0.0005)	ND (0.0015)
	Sep-10	not sampled due to 0.04 feet of floating product						
WC-3	Nov-03	not sampled due to 0.03 feet of floating product						
	Sep-04	not sampled due to 0.04 feet of floating product						
	Sep-06	not sampled due to 0.02 feet of floating product						
	Sep-10	not sampled due to 0.04 feet of floating product						
	Sept 11, Sept 12, June 13, Aug 14	not sampled due to 0.01 feet of floating product						

Sources of historical data: Hart Crowser 2004, 2005, 2006; Clarus Technologies 2010; Restoration Science & Engineering 2011; and FES 2012, 2013, 2014.

Results in **bold** and **yellow highlight** exceed the cleanup level.

The higher field duplicate result is displayed, when applicable.

B - analyte was also detected in a blank, and may possibly be due to cross-contamination

ADEC - Alaska Department of Environmental Conservation

DRO - diesel range organics

EPA - Environmental Protection Agency

GRO - gasoline range organics

J - Result is an estimated value

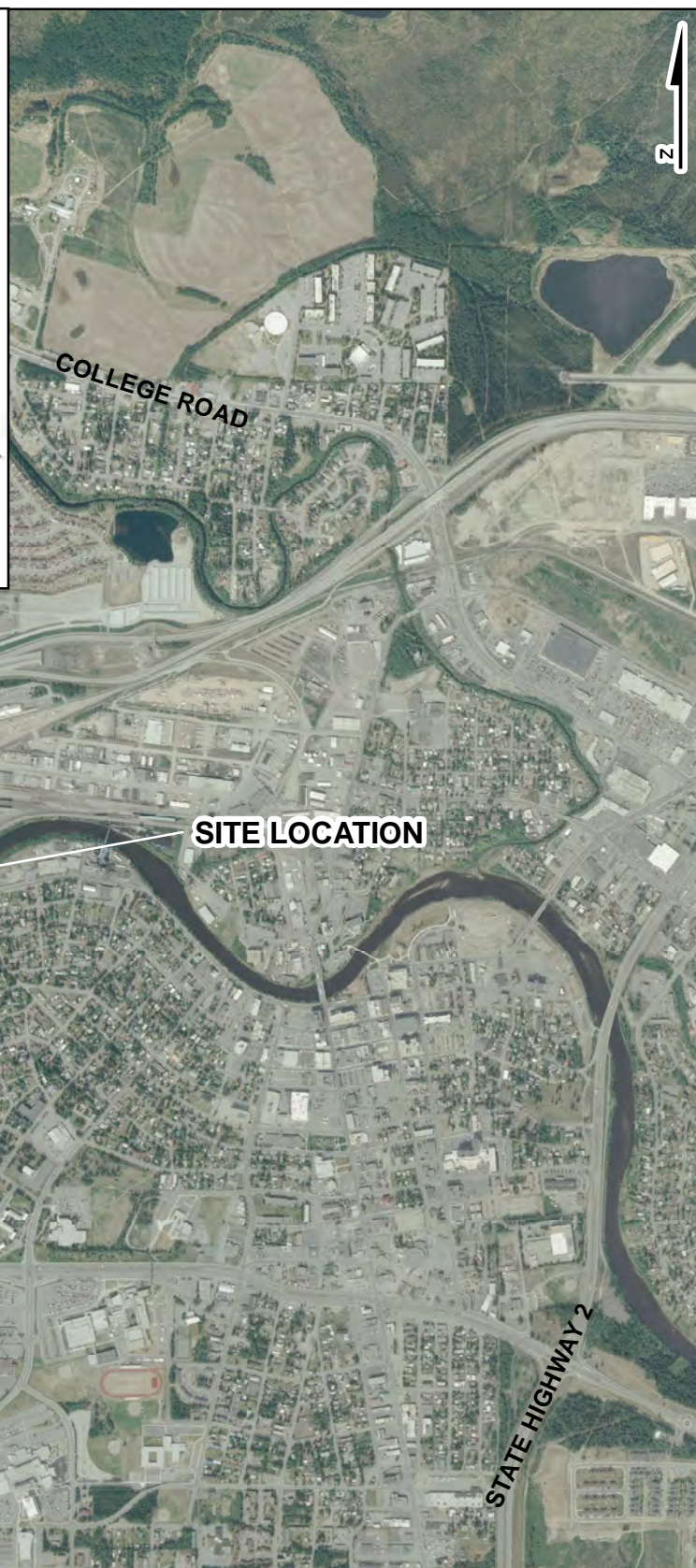
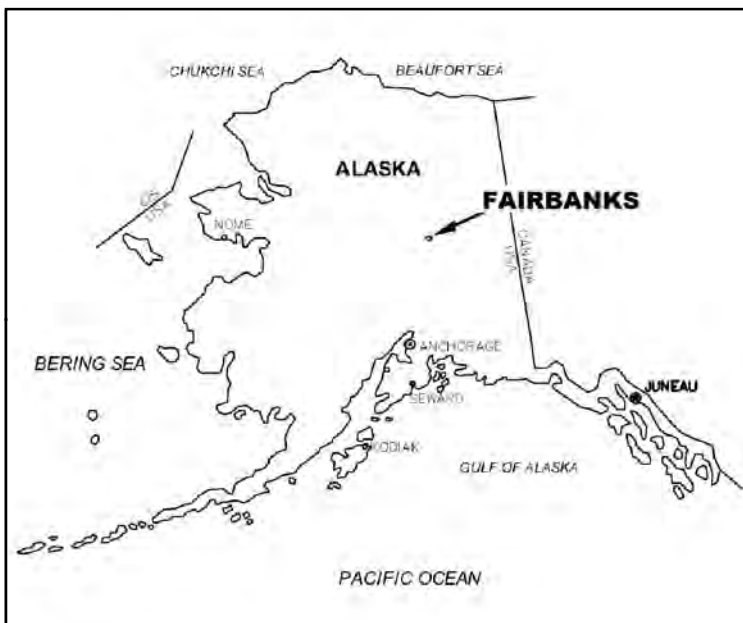
mg/L - milligrams per liter

NA - not analyzed

ND - analyte was not detected

RRO - residual range organics





**NOTE:**

Source: Aerial Imagery was provided by Alaska Mapped (UAF-GINA/SDMI <http://alaskamapped.org/bdl>).

Fairbanks Environmental Services  
3538 International Street  
Fairbanks, Alaska 99701



**ALASKA RAILROAD  
CORPORATION**

**Vicinity Map**

2014 Report  
Fairbanks Rail Yard  
Fairbanks, Alaska

CONTRACT:  
85304

FIGURE:  
1

DATE:  
12/14








#### NOTES:

1. Locations of former diesel tanks are approximate; monitoring wells were surveyed during 2012 field work; well MW-3 could not be located. Well MW-1 was broken and MW-2 contained 0.33-foot of product in 2014.

2. Sources: Aerial Imagery was provided by Alaska Mapped (UAF-GINA/SDMI <http://alaskamapped.org/bdl>).

#### LEGEND:

-  Existing Monitoring Well
-  Well Location Unknown
-  Groundwater Contour (0.1-foot)

Fairbanks Environmental Services  
3538 International Street  
Fairbanks, Alaska 99701



ALASKA RAILROAD  
CORPORATION

**Site Map**  
2014 Report  
Fairbanks Rail Yard  
Fairbanks, Alaska

CONTRACT:  
85304

FIGURE:  
2

DATE:  
12/14

**APPENDIX A**  
**LABORATORY REPORT 1144143**

## Laboratory Report of Analysis

To: AK Railroad Corp  
2400 Spenard Road, Suite 300  
Anchorage, AK 99503  
(907)277-7111

Report Number: **1144143**

Client Project: **Fairbanks Rail Yard (ARRC)**

Dear Mike Boese,

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 five 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 Justin 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.



SGS North America Inc.  
Environmental Services - Alaska Division  
Project Manager

Justin Nelson  
2014.09.05  
12:22:12 -08'00'

Justin Nelson  
Project Manager  
Justin.Nelson@sgs.com

Date

Print Date: 09/05/2014 8:39:01AM

## Case Narrative

SGS Client: **AK Railroad Corp**  
 SGS Project: **1144143**  
 Project Name/Site: **Fairbanks Rail Yard (ARRC)**  
 Project Contact: **Mike Boese**

Refer to sample receipt form for information on sample condition.

### **MW-4 (1144143001) PS**

AK102 - Unknown hydrocarbon with several peaks is present.

### **MW-7 (1144143003) PS**

AK102 - The pattern is consistent with a weathered middle distillate.

### **MW-X (1144143004) PS**

AK102 - The pattern is consistent with a weathered middle distillate.

AK103 - Unknown hydrocarbon with several peaks is present.

### **MW-6 (1144143005) PS**

AK102 - The pattern is consistent with a weathered middle distillate.

AK103 - Unknown hydrocarbon with several peaks is present.

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

Print Date: 09/05/2014 8:39:01AM

## 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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<[http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)>), unless other written agreements have been accepted by both parties.

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: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
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
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
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.

### Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
MW-4	1144143001	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
MW-5	1144143002	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
MW-7	1144143003	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
MW-X	1144143004	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
MW-6	1144143005	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
MW-9	1144143006	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
MW-8	1144143007	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)
Trip Blank	1144143008	08/26/2014	08/28/2014	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO/RRO Low Volume Water
AK103	DRO/RRO Low Volume Water

Print Date: 09/05/2014 8:39:04AM



## Detectable Results Summary

Client Sample ID: **MW-4**  
 Lab Sample ID: 1144143001  
**Semivolatile Organic Fuels**  
**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	1.80	mg/L
Ethylbenzene	6.35	ug/L
Gasoline Range Organics	0.251	mg/L
o-Xylene	5.53	ug/L
P & M -Xylene	12.7	ug/L

Client Sample ID: **MW-5**  
 Lab Sample ID: 1144143002  
**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	0.225J	mg/L

Client Sample ID: **MW-7**  
 Lab Sample ID: 1144143003  
**Semivolatile Organic Fuels**  
**Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6.05	mg/L
Benzene	0.330J	ug/L
Gasoline Range Organics	0.0473J	mg/L

Client Sample ID: **MW-X**  
 Lab Sample ID: 1144143004  
**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6.73	mg/L
Residual Range Organics	1.05	mg/L
Benzene	0.310J	ug/L
Gasoline Range Organics	0.0508J	mg/L

Client Sample ID: **MW-6**  
 Lab Sample ID: 1144143005  
**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	6.94	mg/L
Residual Range Organics	1.41	mg/L
Benzene	4.34	ug/L
Ethylbenzene	4.03	ug/L
Gasoline Range Organics	0.168	mg/L
o-Xylene	6.78	ug/L
P & M -Xylene	11.5	ug/L

**Volatile Fuels**



## Results of MW-4

Client Sample ID: **MW-4**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143001  
 Lab Project ID: 1144143

Collection Date: 08/26/14 10:45  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-4

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	1.80	0.600	0.180	mg/L	1		09/02/14 17:24
<b>Surrogates</b>							
5a Androstane	85.5	50-150		%	1		09/02/14 17:24

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK102  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 17:24  
 Container ID: 1144143001-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.250 U	0.500	0.150	mg/L	1		09/02/14 17:24
<b>Surrogates</b>							
n-Triacontane-d62	98.5	50-150		%	1		09/02/14 17:24

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK103  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 17:24  
 Container ID: 1144143001-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-4

Client Sample ID: **MW-4**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143001  
 Lab Project ID: 1144143

Collection Date: 08/26/14 10:45  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-4

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.251	0.100	0.0310	mg/L	1		08/30/14 22:31

### Surrogates

4-Bromofluorobenzene	120	50-150		%	1		08/30/14 22:31
----------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 22:31  
 Container ID: 1144143001-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		08/30/14 22:31
Ethylbenzene	6.35	1.00	0.310	ug/L	1		08/30/14 22:31
o-Xylene	5.53	1.00	0.310	ug/L	1		08/30/14 22:31
P & M -Xylene	12.7	2.00	0.620	ug/L	1		08/30/14 22:31
Toluene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:31

### Surrogates

1,4-Difluorobenzene	92.1	77-115		%	1		08/30/14 22:31
---------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 22:31  
 Container ID: 1144143001-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM



#### Results of MW-5

Client Sample ID: **MW-5**  
Client Project ID: **Fairbanks Rail Yard (ARRC)**  
Lab Sample ID: 1144143002  
Lab Project ID: 1144143

Collection Date: 08/26/14 10:55  
Received Date: 08/28/14 09:00  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location: MW-5

#### Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.225 J	0.610	0.183	mg/L	1		09/02/14 17:45
<b>Surrogates</b>							
5a Androstane	74.4	50-150		%	1		09/02/14 17:45

#### Batch Information

Analytical Batch: XFC11544  
Analytical Method: AK102  
Analyst: EAB  
Analytical Date/Time: 09/02/14 17:45  
Container ID: 1144143002-D

Prep Batch: XXX31858  
Prep Method: SW3520C  
Prep Date/Time: 08/29/14 09:55  
Prep Initial Wt./Vol.: 246 mL  
Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.254 U	0.508	0.152	mg/L	1		09/02/14 17:45
<b>Surrogates</b>							
n-Triacontane-d62	87.3	50-150		%	1		09/02/14 17:45

#### Batch Information

Analytical Batch: XFC11544  
Analytical Method: AK103  
Analyst: EAB  
Analytical Date/Time: 09/02/14 17:45  
Container ID: 1144143002-D

Prep Batch: XXX31858  
Prep Method: SW3520C  
Prep Date/Time: 08/29/14 09:55  
Prep Initial Wt./Vol.: 246 mL  
Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-5

Client Sample ID: **MW-5**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143002  
 Lab Project ID: 1144143

Collection Date: 08/26/14 10:55  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-5

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/30/14 22:50

### Surrogates

4-Bromofluorobenzene	103	50-150		%	1		08/30/14 22:50
----------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 22:50  
 Container ID: 1144143002-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		08/30/14 22:50
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:50
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:50
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/30/14 22:50
Toluene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:50

### Surrogates

1,4-Difluorobenzene	98.8	77-115		%	1		08/30/14 22:50
---------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 22:50  
 Container ID: 1144143002-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-7

Client Sample ID: **MW-7**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143003  
 Lab Project ID: 1144143

Collection Date: 08/26/14 11:30  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-7

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	6.05	0.652	0.196	mg/L	1		09/02/14 18:05
<b>Surrogates</b>							
5a Androstane	86.9	50-150		%	1		09/02/14 18:05

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK102  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 18:05  
 Container ID: 1144143003-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 230 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.272 U	0.543	0.163	mg/L	1		09/02/14 18:05
<b>Surrogates</b>							
n-Triacontane-d62	99.2	50-150		%	1		09/02/14 18:05

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK103  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 18:05  
 Container ID: 1144143003-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 230 mL  
 Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-7

Client Sample ID: **MW-7**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143003  
 Lab Project ID: 1144143

Collection Date: 08/26/14 11:30  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-7

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0473 J	0.100	0.0310	mg/L	1		08/30/14 23:09

### Surrogates

4-Bromofluorobenzene	95.7	50-150		%	1		08/30/14 23:09
----------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 23:09  
 Container ID: 1144143003-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.330 J	0.500	0.150	ug/L	1		08/30/14 23:09
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:09
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:09
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/30/14 23:09
Toluene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:09

### Surrogates

1,4-Difluorobenzene	96.7	77-115		%	1		08/30/14 23:09
---------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 23:09  
 Container ID: 1144143003-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-X

Client Sample ID: **MW-X**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143004  
 Lab Project ID: 1144143

Collection Date: 08/26/14 11:45  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-X

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	6.73	0.612	0.184	mg/L	1		09/02/14 18:26
<b>Surrogates</b>							
5a Androstane	83.9	50-150		%	1		09/02/14 18:26

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK102  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 18:26  
 Container ID: 1144143004-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 245 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.05	0.510	0.153	mg/L	1		09/02/14 18:26
<b>Surrogates</b>							
n-Triacontane-d62	95.8	50-150		%	1		09/02/14 18:26

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK103  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 18:26  
 Container ID: 1144143004-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 245 mL  
 Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-X

Client Sample ID: **MW-X**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143004  
 Lab Project ID: 1144143

Collection Date: 08/26/14 11:45  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-X

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0508 J	0.100	0.0310	mg/L	1		08/30/14 23:28

### Surrogates

4-Bromofluorobenzene	95.8	50-150		%	1		08/30/14 23:28
----------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 23:28  
 Container ID: 1144143004-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.310 J	0.500	0.150	ug/L	1		08/30/14 23:28
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:28
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:28
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/30/14 23:28
Toluene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:28

### Surrogates

1,4-Difluorobenzene	97.5	77-115		%	1		08/30/14 23:28
---------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 23:28  
 Container ID: 1144143004-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM



## Results of MW-6

Client Sample ID: **MW-6**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143005  
 Lab Project ID: 1144143

Collection Date: 08/26/14 11:35  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-6

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	6.94	0.600	0.180	mg/L	1		09/02/14 18:47
<b>Surrogates</b>							
5a Androstane	86.6	50-150		%	1		09/02/14 18:47

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK102  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 18:47  
 Container ID: 1144143005-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	1.41	0.500	0.150	mg/L	1		09/02/14 18:47
<b>Surrogates</b>							
n-Triacontane-d62	98.5	50-150		%	1		09/02/14 18:47

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK103  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 18:47  
 Container ID: 1144143005-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-6

Client Sample ID: **MW-6**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143005  
 Lab Project ID: 1144143

Collection Date: 08/26/14 11:35  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-6

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.168	0.100	0.0310	mg/L	1		08/30/14 23:47

### Surrogates

4-Bromofluorobenzene	105	50-150		%	1		08/30/14 23:47
----------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 23:47  
 Container ID: 1144143005-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	4.34	0.500	0.150	ug/L	1		08/30/14 23:47
Ethylbenzene	4.03	1.00	0.310	ug/L	1		08/30/14 23:47
o-Xylene	6.78	1.00	0.310	ug/L	1		08/30/14 23:47
P & M -Xylene	11.5	2.00	0.620	ug/L	1		08/30/14 23:47
Toluene	0.500 U	1.00	0.310	ug/L	1		08/30/14 23:47

### Surrogates

1,4-Difluorobenzene	103	77-115		%	1		08/30/14 23:47
---------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 23:47  
 Container ID: 1144143005-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-9

Client Sample ID: **MW-9**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143006  
 Lab Project ID: 1144143

Collection Date: 08/26/14 13:55  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-9

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.302 U	0.605	0.181	mg/L	1		09/02/14 19:08
<b>Surrogates</b>							
5a Androstane	91.7	50-150		%	1		09/02/14 19:08

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK102  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 19:08  
 Container ID: 1144143006-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 248 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.252 U	0.504	0.151	mg/L	1		09/02/14 19:08
<b>Surrogates</b>							
n-Triacontane-d62	103	50-150		%	1		09/02/14 19:08

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK103  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 19:08  
 Container ID: 1144143006-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 248 mL  
 Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-9

Client Sample ID: **MW-9**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143006  
 Lab Project ID: 1144143

Collection Date: 08/26/14 13:55  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-9

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/14 00:06

### Surrogates

4-Bromofluorobenzene	101	50-150		%	1		08/31/14 00:06
----------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/31/14 00:06  
 Container ID: 1144143006-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		08/31/14 00:06
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/14 00:06
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/14 00:06
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/14 00:06
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/14 00:06

### Surrogates

1,4-Difluorobenzene	102	77-115		%	1		08/31/14 00:06
---------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/31/14 00:06  
 Container ID: 1144143006-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-8

Client Sample ID: **MW-8**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143007  
 Lab Project ID: 1144143

Collection Date: 08/26/14 14:00  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-8

## Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.300 U	0.600	0.180	mg/L	1		09/02/14 19:28
<b>Surrogates</b>							
5a Androstane	89.3	50-150		%	1		09/02/14 19:28

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK102  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 19:28  
 Container ID: 1144143007-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	0.250 U	0.500	0.150	mg/L	1		09/02/14 19:28
<b>Surrogates</b>							
n-Triacontane-d62	99.8	50-150		%	1		09/02/14 19:28

## Batch Information

Analytical Batch: XFC11544  
 Analytical Method: AK103  
 Analyst: EAB  
 Analytical Date/Time: 09/02/14 19:28  
 Container ID: 1144143007-D

Prep Batch: XXX31858  
 Prep Method: SW3520C  
 Prep Date/Time: 08/29/14 09:55  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:06AM

## Results of MW-8

Client Sample ID: **MW-8**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143007  
 Lab Project ID: 1144143

Collection Date: 08/26/14 14:00  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: MW-8

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/31/14 00:25

### Surrogates

4-Bromofluorobenzene	98.6	50-150		%	1		08/31/14 00:25
----------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/31/14 00:25  
 Container ID: 1144143007-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		08/31/14 00:25
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/31/14 00:25
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/31/14 00:25
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/31/14 00:25
Toluene	0.500 U	1.00	0.310	ug/L	1		08/31/14 00:25

### Surrogates

1,4-Difluorobenzene	93.9	77-115		%	1		08/31/14 00:25
---------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/31/14 00:25  
 Container ID: 1144143007-A

Prep Batch: VXX26362  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM

## Results of Trip Blank

Client Sample ID: **Trip Blank**  
 Client Project ID: **Fairbanks Rail Yard (ARRC)**  
 Lab Sample ID: 1144143008  
 Lab Project ID: 1144143

Collection Date: 08/26/14 08:00  
 Received Date: 08/28/14 09:00  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location: Trip Blank

## Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500 U	0.100	0.0310	mg/L	1		08/30/14 22:13

### Surrogates

4-Bromofluorobenzene	102	50-150		%	1		08/30/14 22:13
----------------------	-----	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: AK101  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 22:13  
 Container ID: 1144143008-A

Prep Batch: VXX26361  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.250 U	0.500	0.150	ug/L	1		08/30/14 22:13
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:13
o-Xylene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:13
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		08/30/14 22:13
Toluene	0.500 U	1.00	0.310	ug/L	1		08/30/14 22:13

### Surrogates

1,4-Difluorobenzene	97.6	77-115		%	1		08/30/14 22:13
---------------------	------	--------	--	---	---	--	----------------

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Analyst: ST  
 Analytical Date/Time: 08/30/14 22:13  
 Container ID: 1144143008-A

Prep Batch: VXX26361  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/14 08:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:06AM

## Method Blank

Blank ID: MB for HBN 1629861 [VXX/26361]  
Blank Lab ID: 1230728

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1144143008

## Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene	101	50-150		%

## Batch Information

Analytical Batch: VFC12077  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: ST  
Analytical Date/Time: 8/30/2014 11:28:00AM

Prep Batch: VXX26361  
Prep Method: SW5030B  
Prep Date/Time: 8/30/2014 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:08AM



## Blank Spike Summary

Blank Spike ID: LCS for HBN 1144143 [VXX26361]  
 Blank Spike Lab ID: 1230731  
 Date Analyzed: 08/30/2014 12:24

Spike Duplicate ID: LCSD for HBN 1144143  
 [VXX26361]  
 Spike Duplicate Lab ID: 1230732  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1144143008

## Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.993	99	1.00	0.997	100	( 60-120 )	0.42	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene	0.0500		116	0.0500		105	( 50-150 )	10.20	

## Batch Information

Analytical Batch: **VFC12077**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **ST**

Prep Batch: **VXX26361**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/30/2014 08:00**  
 Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL  
 Dup Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:09AM

## Method Blank

Blank ID: MB for HBN 1629861 [VXX/26361]  
Blank Lab ID: 1230728

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1144143008

## Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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
<b>Surrogates</b>				
1,4-Difluorobenzene	98.2	77-115		%

## Batch Information

Analytical Batch: VFC12077  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: ST  
Analytical Date/Time: 8/30/2014 11:28:00AM

Prep Batch: VXX26361  
Prep Method: SW5030B  
Prep Date/Time: 8/30/2014 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1144143 [VXX26361]  
 Blank Spike Lab ID: 1230729  
 Date Analyzed: 08/30/2014 12:05

Spike Duplicate ID: LCSD for HBN 1144143 [VXX26361]  
 Spike Duplicate Lab ID: 1230730  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1144143008

## Results by SW8021B

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	100	94.4	94	100	97.9	98	( 80-120 )	3.60	(< 20 )
Ethylbenzene	100	99.4	99	100	103	103	( 75-125 )	3.90	(< 20 )
o-Xylene	100	98.4	98	100	102	102	( 80-120 )	3.60	(< 20 )
P & M -Xylene	200	197	99	200	205	102	( 75-130 )	4.00	(< 20 )
Toluene	100	99.4	99	100	103	103	( 75-120 )	3.80	(< 20 )
<b>Surrogates</b>									
1,4-Difluorobenzene	50		106	50		107	( 77-115 )	1.30	

## Batch Information

Analytical Batch: VFC12077  
 Analytical Method: SW8021B  
 Instrument: Agilent 7890A PID/FID  
 Analyst: ST

Prep Batch: VXX26361  
 Prep Method: SW5030B  
 Prep Date/Time: 08/30/2014 08:00  
 Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL  
 Dup Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:12AM

## Method Blank

Blank ID: MB for HBN 1629862 [VXX/26362]  
Blank Lab ID: 1230733

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
<b>Surrogates</b>				
4-Bromofluorobenzene	101	50-150		%

## Batch Information

Analytical Batch: VFC12077  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: ST  
Analytical Date/Time: 8/30/2014 9:54:00PM

Prep Batch: VXX26362  
Prep Method: SW5030B  
Prep Date/Time: 8/30/2014 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:14AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1144143 [VXX26362]

Blank Spike Lab ID: 1230736

Date Analyzed: 08/31/2014 01:40

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by AK101

### Blank Spike (mg/L)

Parameter	Spike	Result	Rec (%)	CL
Gasoline Range Organics	1.00	0.942	94	( 60-120 )

### Surrogates

4-Bromofluorobenzene	0.0500		105	( 50-150 )
----------------------	--------	--	-----	------------

## Batch Information

Analytical Batch: VFC12077

Analytical Method: AK101

Instrument: Agilent 7890A PID/FID

Analyst: ST

Prep Batch: VXX26362

Prep Method: SW5030B

Prep Date/Time: 08/30/2014 08:00

Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

Dup Init Wt./Vol.: Extract Vol:

Print Date: 09/05/2014 8:39:16AM

## Method Blank

Blank ID: MB for HBN 1629862 [VXX/26362]  
Blank Lab ID: 1230733

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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
<b>Surrogates</b>				
1,4-Difluorobenzene	98.6	77-115		%

## Batch Information

Analytical Batch: VFC12077  
Analytical Method: SW8021B  
Instrument: Agilent 7890A PID/FID  
Analyst: ST  
Analytical Date/Time: 8/30/2014 9:54:00PM

Prep Batch: VXX26362  
Prep Method: SW5030B  
Prep Date/Time: 8/30/2014 8:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/05/2014 8:39:16AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1144143 [VXX26362]

Blank Spike Lab ID: 1230734

Date Analyzed: 08/31/2014 01:21

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by SW8021B

### Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Benzene	100	96.1	96	( 80-120 )
Ethylbenzene	100	101	101	( 75-125 )
o-Xylene	100	99.8	100	( 80-120 )
P & M -Xylene	200	199	100	( 75-130 )
Toluene	100	101	101	( 75-120 )

### Surrogates

1,4-Difluorobenzene	50		109	( 77-115 )
---------------------	----	--	-----	------------

## Batch Information

Analytical Batch: VFC12077

Analytical Method: SW8021B

Instrument: Agilent 7890A PID/FID

Analyst: ST

Prep Batch: VXX26362

Prep Method: SW5030B

Prep Date/Time: 08/30/2014 08:00

Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

Dup Init Wt./Vol.: Extract Vol:

## Method Blank

Blank ID: MB for HBN 1628263 [XXX/31858]  
Blank Lab ID: 1230429

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	0.213J	0.600	0.180	mg/L
<b>Surrogates</b>				
5a Androstane	85.9	60-120		%

## Batch Information

Analytical Batch: XFC11544  
Analytical Method: AK102  
Instrument: HP 7890A FID SV E F  
Analyst: EAB  
Analytical Date/Time: 9/2/2014 3:00:00PM

Prep Batch: XXX31858  
Prep Method: SW3520C  
Prep Date/Time: 8/29/2014 9:55:44AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:18AM



## Blank Spike Summary

Blank Spike ID: LCS for HBN 1144143 [XXX31858]  
 Blank Spike Lab ID: 1230430  
 Date Analyzed: 09/02/2014 15:20

Spike Duplicate ID: LCSD for HBN 1144143  
 [XXX31858]  
 Spike Duplicate Lab ID: 1230431  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	20	17.8	89	20	17.4	87	( 75-125 )	2.30	(< 20 )
<b>Surrogates</b>									
5a Androstane	0.4		89	0.4		90	( 60-120 )	1.20	

## Batch Information

Analytical Batch: **XFC11544**  
 Analytical Method: **AK102**  
 Instrument: **HP 7890A** **FID SV E F**  
 Analyst: **EAB**

Prep Batch: **XXX31858**  
 Prep Method: **SW3520C**  
 Prep Date/Time: **08/29/2014 09:55**  
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
 Dup Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:20AM

## Method Blank

Blank ID: MB for HBN 1628263 [XXX/31858]  
Blank Lab ID: 1230429

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	0.250U	0.500	0.150	mg/L
<b>Surrogates</b>				
n-Triacontane-d62	101	60-120		%

## Batch Information

Analytical Batch: XFC11544  
Analytical Method: AK103  
Instrument: HP 7890A FID SV E F  
Analyst: EAB  
Analytical Date/Time: 9/2/2014 3:00:00PM

Prep Batch: XXX31858  
Prep Method: SW3520C  
Prep Date/Time: 8/29/2014 9:55:44AM  
Prep Initial Wt./Vol.: 250 mL  
Prep Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:21AM

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1144143 [XXX31858]  
 Blank Spike Lab ID: 1230430  
 Date Analyzed: 09/02/2014 15:20

Spike Duplicate ID: LCSD for HBN 1144143  
 [XXX31858]  
 Spike Duplicate Lab ID: 1230431  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1144143001, 1144143002, 1144143003, 1144143004, 1144143005, 1144143006, 1144143007

## Results by AK103

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	20	17.9	89	20	17.7	89	( 60-120 )	0.88	(< 20 )
<b>Surrogates</b>									
n-Triacontane-d62	0.4		94	0.4		94	( 60-120 )	0.18	

## Batch Information

Analytical Batch: **XFC11544**  
 Analytical Method: **AK103**  
 Instrument: **HP 7890A** **FID SV E F**  
 Analyst: **EAB**

Prep Batch: **XXX31858**  
 Prep Method: **SW3520C**  
 Prep Date/Time: **08/29/2014 09:55**  
 Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL  
 Dup Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

Print Date: 09/05/2014 8:39:23AM



SGS North America Inc.  
CHAIN OF CUSTODY RECORD

Locations Nationwide

1144143



CLIENT: Fairbanks Environmental Services				SGS Reference #:				page 1 of 1			
CONTACT: Mike Boese				PHONE NO: 907-452-1006							
PROJECT/SITE: Fairbanks Rail Yard (ARRC)											
REPORTS TO: Mike Boese				E-MAIL: MBoese@FESalaska.com							
INVOICE TO: ARRC				Project: ARRC							
CONTRACT NUMBER: ARRC - 265-2429											
LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/ MATRIX CODE	#	Preservative SAMPLE TYPE C = COMP G = GRAB MI = Multi Incremental Samples	HCI	HCI	DOD Project? NO	Special Deliverable Requirements:	
1A-E	MW-4	8/26/2014	1045	Water	5	G	3	2	082701	Level 2 Data Package, EQuIS, and PDF. No hard copy required.	
2A-E	MW-5	8/26/2014	1055	Water	5	G	3	2			
3A-E	MW-7	8/26/2014	1130	Water	5	G	3	2			
4A-E	MW-X	8/26/2014	1145	Water	5	G	3	2			
5A-E	MW-6	8/26/2014	1135	Water	5	G	3	2			
6A-E	MW-9	8/26/2014	1355	Water	5	G	3	2			
7A-E	MW-8	8/26/2014	1400	Water	5	G	3	2			
8A-C	Trip Blank	8/26/2014	800	Water	3	G	3				
Collected/Relinquished By: (1) <i>Chris Boese</i>										Special Deliverable Requirements:	
Relinquished By: (2)											
Relinquished By: (3)											
Relinquished By: (4)											
Requested Turnaround Time and/or Special Instructions:											
Normal TAT, Bill ARRC directly (265-2429)											
Temperature Blank °C: 0.7 #205										Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT	
Received For Laboratory By: <i>Cory D...</i>										1 F 1 B	

33 of 36  
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.htm](http://www.sgs.com/terms_and_conditions.htm)





## SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were <b>custody seals</b> intact? Note # & location, if applicable. COC accompanied samples? <u>1F, 1B</u>	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No	<input type="checkbox"/> Exemption permitted if sampler hand carries/delivers.
<b>Temperature blank</b> compliant* (i.e., 0-6°C after CF)? If >6°C, were samples collected <8 hours ago? If <0°C, were all sample containers ice free? Cooler ID: <u>082101</u> @ <u>0.7</u> w/ Therm.ID: <u>205</u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ If samples are 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."	<input checked="" type="radio"/> Yes No <u>N/A</u> Yes No <u>N/A</u> Yes No <u>N/A</u>	<input type="checkbox"/> Exemption permitted if chilled & collected <8 hrs ago.  <i>Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.</i>
Delivery method (specify all that apply): Client (hand carried) USPS <u>Lynden</u> AK Air Alert Courier UPS FedEx RAVN C&D Delivery Carlisle Pen Air Warp Speed Other: _____ → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Tracking/AB # or see attached or <u>N/A</u>  Yes No <u>N/A</u>	
→ For samples received with payment, note amount ( \$ ) and whether cash / check / CC (circle one) was received. → For samples received in FBKS, ANCH staff will verify all criteria are reviewed. SRF initiated in FBKS by:		
Were samples received within hold time? Do samples <b>match</b> COC* (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	<i>Note: Refer to form F-083 "Sample Guide" for hold times. Note: If times differ &lt;1hr, record details and login per COC.</i>
Were samples in <b>good condition</b> (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>Bubble Wrap</u> Separate plastic bags Vermiculite Other: _____	<input checked="" type="radio"/> Yes No	
Were <b>proper containers</b> (type/mass/volume/preservative*) used? Were <b>Trip Blanks</b> (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials <b>free of headspace</b> (i.e., bubbles ≤6 mm)? Were all soil VOAs <b>field extracted</b> with MeOH+BFB?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No <u>N/A</u>	<input type="checkbox"/> Exemption permitted for metals (e.g., 200.8/6020A).
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was <b>pH verified and compliant</b> ? If pH was adjusted, were bottles flagged (i.e., stickers)?	<input checked="" type="radio"/> Yes No N/A Yes No <u>N/A</u>	
For <b>special handling</b> (e.g., "MI" soils, foreign soils, lab filter for dissolved..., lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	Yes No <u>N/A</u>	
For <b>RUSH/SHORT Hold Time</b> , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No <u>N/A</u>	
For <b>SITE-SPECIFIC QC</b> , e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	Yes No <u>N/A</u>	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No <u>N/A</u>	SRF Completed by <u>CRD</u> PM notified: N/A
Was <b>PEER REVIEW</b> of sample numbering/labeling completed?	Yes No <u>N/A</u>	Peer Reviewed by: N/A
Additional notes (if applicable):		

*Note to Client: Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.*

## Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1144143001-A	HCL to pH < 2	OK			
1144143001-B	HCL to pH < 2	OK			
1144143001-C	HCL to pH < 2	OK			
1144143001-D	HCL to pH < 2	OK			
1144143001-E	HCL to pH < 2	OK			
1144143002-A	HCL to pH < 2	OK			
1144143002-B	HCL to pH < 2	OK			
1144143002-C	HCL to pH < 2	OK			
1144143002-D	HCL to pH < 2	OK			
1144143002-E	HCL to pH < 2	OK			
1144143003-A	HCL to pH < 2	OK			
1144143003-B	HCL to pH < 2	OK			
1144143003-C	HCL to pH < 2	OK			
1144143003-D	HCL to pH < 2	OK			
1144143003-E	HCL to pH < 2	OK			
1144143004-A	HCL to pH < 2	OK			
1144143004-B	HCL to pH < 2	OK			
1144143004-C	HCL to pH < 2	OK			
1144143004-D	HCL to pH < 2	OK			
1144143004-E	HCL to pH < 2	OK			
1144143005-A	HCL to pH < 2	OK			
1144143005-B	HCL to pH < 2	OK			
1144143005-C	HCL to pH < 2	OK			
1144143005-D	HCL to pH < 2	OK			
1144143005-E	HCL to pH < 2	OK			
1144143006-A	HCL to pH < 2	OK			
1144143006-B	HCL to pH < 2	OK			
1144143006-C	HCL to pH < 2	OK			
1144143006-D	HCL to pH < 2	OK			
1144143006-E	HCL to pH < 2	OK			
1144143007-A	HCL to pH < 2	OK			
1144143007-B	HCL to pH < 2	OK			
1144143007-C	HCL to pH < 2	OK			
1144143007-D	HCL to pH < 2	OK			
1144143007-E	HCL to pH < 2	OK			
1144143008-A	HCL to pH < 2	OK			
1144143008-B	HCL to pH < 2	OK			
1144143008-C	HCL to pH < 2	OK			



<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
---------------------	---------------------	----------------------------	---------------------	---------------------	----------------------------

Container Condition Glossary

OK - The container was received at an acceptable pH for the analysis requested.

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.

BU - The container was received with headspace greater than 6mm.

**APPENDIX B**  
**ADEC LABORATORY DATA REVIEW CHECKLIST**



## Laboratory Data Review Checklist

Completed by:

Title:  Date:

CS Report Name:  Report Date:

Consultant Firm:

Laboratory Number:  Name: Laboratory Report

ADEC File Number:  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:

- 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:

No samples were transferred or sub-contracted to a different laboratory.

### 2. Chain of Custody (COC)

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

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

### 3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ( $4^{\circ} \pm 2^{\circ} \text{C}$ )?  
Yes   ☒ No   NA (Please explain.)   Comments:

The sample cooler was received at SGS with a temperature blank ( $0.7^{\circ} \text{C}$ ) reading below the accepted temperature range ( $4^{\circ} \pm 2^{\circ} \text{C}$ ). Since the temperature is above freezing temperature and the samples were reportedly received in good condition, data quality was not affected.

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

■Yes No NA (Please explain.)

Comments:

- c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

■Yes No NA (Please explain.)

Comments:

With exception to temperature, all samples were in acceptable 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:

All samples were documented to be in acceptable condition.

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

Comments:

No adverse impact to data quality. The temperature blank was below acceptable range, but all samples were in good condition.

#### 4. Case Narrative

- a. Present and understandable?

■Yes No NA (Please explain.)

Comments:

- b. Discrepancies, errors or QC failures identified by the lab?

Yes No ■NA (Please explain.)

Comments:

The laboratory did not identify any errors in the Case Narrative.

- c. Were all corrective actions documented?

Yes No ■NA (Please explain.)

Comments:

The laboratory did not identify any errors in the Case Narrative.

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

Comments:

The case narrative only described the laboratory qualifications made to the data based on problems encountered during sample receiving and analysis. The laboratory did not identify any errors in the Case Narrative.

#### 5. Samples Results

- a. Correct analyses performed/reported as requested on COC?

■Yes No NA (Please explain.)

Comments:

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:

No soil samples submitted or analysis.

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:

e. Data quality or usability affected?

Comments:

Not applicable. No data adversely impacted.

## 6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

■Yes No NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

■Yes No NA (Please explain.)

Comments:

However, DRO was detected in the method blank at a concentration below the LOQ (0.213 J). Consequently all DRO results reported with concentrations within 10X the method blank concentration were qualified with a B. They include samples MW-4 and MW-5. Impact to sample MW-4 is notable because the DRO concentration in this sample was just above the ADEC cleanup level; however, DRO has exceeded the cleanup level in this well since 2004.

iii. If above PQL, what samples are affected?

Comments:

See 6aii.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

■Yes No NA (Please explain.)

Comments:

See 6ii.

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

Comments:

See 6aii.

b. 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:

An LCSD samples was not analyzed for AK101/8021B batch VXX26362. Consequently, precision could not be evaluated for this analytical batch. LCS accuracy was acceptable. All project samples except the TB were included in this batch.

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

Yes ☐ No ☒ NA (Please explain.)

Comments:

No metals or inorganics analyses were performed.

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:

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:

However, precision could not be evaluated for AK101/8021B batch VXX26362 (see 6bi)

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

Comments:

Not applicable

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

Yes ☐ No ☒ NA (Please explain.)

Comments:

Batch precision and accuracy were acceptable (except precision could not be calculated for AK101/8021B batch VXX26362 (see 6bi). No data flags were required.

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

Batch precision and accuracy were acceptable (except precision could not be calculated for AK101/8021B batch VXX26362 (see 6bi). No data flags were required.

Comments:

c. Surrogates – Organics Only

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

- 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 was not impacted. No samples had failed surrogate recoveries.

d. 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:

- 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:

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

No analytes were detected in the trip blank sample.

iv. If above PQL, what samples are affected?

Comments:

Not applicable. No analytes were detected in the trip blank sample.

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

Comments:

Data quality was not impacted. No analytes were detected in the trip blank sample.

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

■ Yes No NA (Please explain.)

Comments:

Sample MW-X was a field duplicate sample for project sample MW-7.

Field duplicates were collected at a minimum frequency of 10% for all analyses, per contractual requirement.

ii. Submitted blind to lab?

■ Yes No NA (Please explain.)

Comments:

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 field duplicate sample results were comparable ( $\text{RPD} \leq 30\%$ ) to project sample results, with the exception of RRO (118%) (identified in gray highlight in the table below). The sample's high level of DRO contamination is the suspected reason for the RRO imprecision. Impact to data quality is minor as the RRO results for both primary and field duplicate were below the ADEC cleanup level. Note that the LOD was used for comparing a non detect result, and that the higher of the two results will be used for evaluating the site.

Analyte	Method	Units	MW-7	Qualifier	MW-X	Qualifier	RPD
DRO	AK101	mg/L	6.05		6.73		10
RRO	AK103	mg/L	0.272	U	1.05		118
GRO	AK101	mg/L	0.0473	J	0.0508	J	7
Benzene	8021B	µg/L	0.330	J	0.310	J	6

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

Comments:

Impact to data quality is minor. See comment above (section 6eiii).

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

Yes   ☒ No   NA (Please explain.)

Comments:

Samples were collected using a peristaltic pump and new, disposable tubing at each well, so a rinsate sample was not required.

i. All results less than PQL?

Yes   No   ☒ NA (Please explain.)

Comments:

A rinsate sample was not submitted.

ii. If above PQL, what samples are affected?

Comments:

Not applicable. A rinsate sample was not submitted.

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

Comments:

Not applicable. A rinsate sample was not submitted.

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

☒ Yes   No   NA (Please explain.)

Comments:

Results reported below the limit of quantitation (LOQ) were qualified with a J flag to indicate they are estimated values.