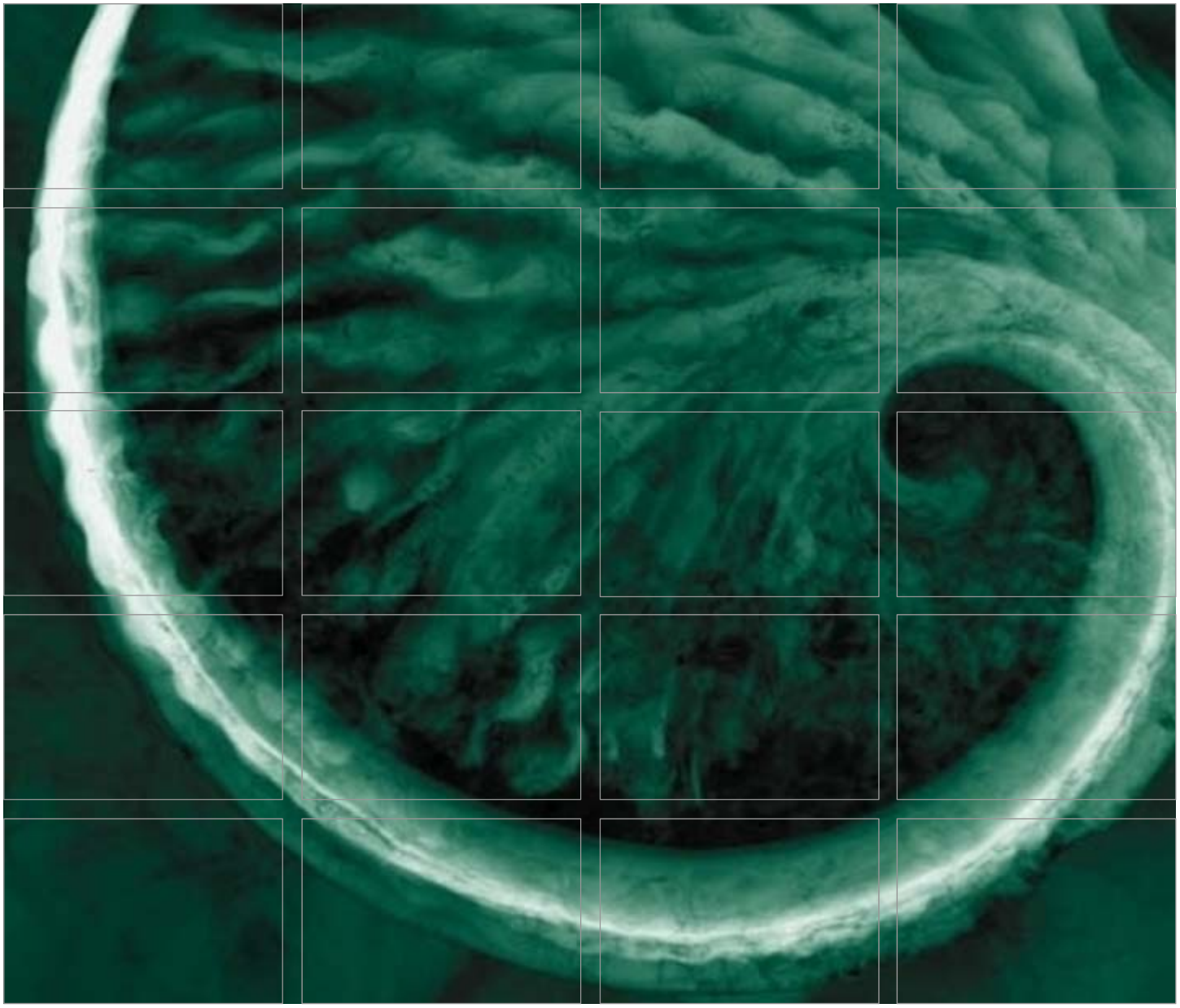

Prepared for:

Horizon Lines of Alaska, LLC

2013 Long-Term Monitoring Report

Port of Anchorage Terminal Facility

February 2014

The world's leading sustainability consultancy

ERM

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2013 Long-Term Monitoring Report
Port of Anchorage Terminal Facility

February 2014

ERM Project # 0220880

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ACRONYMS AND ABBREVIATIONS

AAC ..... Alaska Administrative Code
ADEC ..... Alaska Department of Environmental Conservation
BTEX ..... Benzene, toluene, ethylbenzene, and total xylenes
COC ..... Contaminants of concern
CSM ..... Conceptual site model
DO ..... Dissolved oxygen
DRO ..... Diesel-range organics
ERM ..... ERM Alaska, Inc.
GCL ..... Groundwater cleanup level
GRO ..... Gasoline-range organics
Horizon ..... Horizon Lines of Alaska, LLC
LCS ..... Laboratory control sample
LCSD ..... Laboratory control sample duplicate
LNAPL ..... Light non-aqueous phase liquid
mg/L ..... Milligrams per liter
mL ..... Milliliter
MRL ..... Method Reporting Limit
MS ..... Matrix spike
MSD ..... Matrix Spike Duplicate
ND ..... Non detect
OASIS ..... OASIS Environmental, Inc.
ORP ..... Oxygen-reduction potential
PAH ..... Polycyclic aromatic hydrocarbons
PQL ..... Practical quantitation limit
TVH ..... Total volatile hydrocarbons
UST ..... Underground storage tank

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1. INTRODUCTION

ERM Alaska, Inc. (ERM), under contract to Horizon Lines of Alaska, LLC (Horizon) as a third-party environmental assessor, has been tasked with performing long-term monitoring at Horizon's Port of Anchorage Terminal Facility. This report constitutes the first of three biennial reports as outlined by the work plan for long-term monitoring at the site (ERM 2013). The objective of this report is to summarize the field activities conducted by ERM personnel at the site in 2013, and present results. Figures 1 and 2 depict the site location.

1.1. Background

According to Hart Crower, Inc.'s (Hart Crowser's) Groundwater Monitoring Plan, dated October 2004 (Hart Crowser 2004), three underground storage tanks (USTs) located on the south side of the Maintenance Shop were upgraded in 1997 to meet current regulatory standards. During the upgrades, a 10,000-gallon UST was damaged, and an estimated 5,600 gallons of fuel were released. Response activities reportedly recovered all of the fuel and removed 50 cubic yards of impacted soil. Some impacted soil may remain in conjunction with two of the three tanks that were left in place. As part of the remedial solution, a passive bioventing system consisting of six underground, horizontal, slotted PVC lines were installed. The objective of the bioventing system is to promote in situ remediation through the passive removal of volatile hydrocarbons and the addition of oxygen, which supports aerobic degradation of hydrocarbons in the vadose (unsaturated) zone.

Hart Crowser conducted a release investigation in 2000 to assess the impact of documented releases from USTs located on the southern side of the Maintenance Shop. Four monitoring wells (HC-1, HC-2B, HC-3, and HC-4) were installed. Review of analytical results from the monitoring wells indicated that groundwater concentrations of benzene, gasoline-range organics (GRO), and diesel-range organics (DRO) exceeded the ADEC groundwater cleanup levels (GCLs). All wells contained petroleum hydrocarbon concentrations above GCLs with the exception of HC-4, located at the western side of the former fuel canopy.

In 2002, Hart Crowser installed two new monitoring wells (HC-5 and HC-6) along the Cherry Hill Storm Drain line to determine whether the storm sewer line was acting as a preferential pathway for contaminant migration from the USTs. All existing wells were sampled, with wells HC-1, HC-2B, HC-3, and HC-4 having similar results as in 2000. No compounds were detected above GCLs in HC-5 and HC-6. Hart Crowser conducted two more rounds of groundwater monitoring in November 2004 and March 2005.

In September 2005, OASIS Environmental, Inc. (OASIS) oversaw the removal of the three USTs and associated piping and dispensers. Based on a plan discussed with the ADEC, OASIS left visible petroleum contamination in place during the removal and placed contaminated soil back into the excavation above the water table (OASIS 2005, ADEC

2005). As part of the removal, two monitoring wells (MW-8 and MW-9) were installed at the down-gradient edges of the UST excavation.

ERM (as OASIS) has completed six years of monitoring since the removal of the three USTs September 2005. Monitoring was performed on a semiannual basis from 2005 to 2008 and then reduced to an annual basis from 2009 to 2011, per the approval of the ADEC project manager. A complete summary of monitoring activities completed from 2005 to 2011 is provided in the document *2011 Long Term Monitoring Report, Port of Anchorage Terminal Facility* (OASIS 2011).

Review of groundwater monitoring results for the years 2005 through 2011 indicate that the contaminant plume continues to attenuate and is not migrating offsite. Groundwater hydrocarbon concentrations continue to exceed GCLs, especially in wells located in the vicinity of the former UST excavation. The monitoring data, which is available as far back as October 2000, show that groundwater contaminant concentrations continue to exhibit statistically significant decreasing trends. Stable or not increasing hydrocarbon concentrations at perimeter wells suggests that the plume is not migrating and that attenuation is occurring at the edges of the plume.

An analysis of the 2011 natural attenuation parameter results suggests that the site conditions are transitionally aerobic and reducing. Comparison of Fe (III), nitrate and sulfate concentrations in the background well to the plume wells provides no strong indications of a dominant attenuation process; however, decreasing concentrations in the source area indicate that attenuation is likely occurring.

In 2011, monitoring of the bioventing system continued to show that conditions support the aerobic biodegradation of volatile hydrocarbon in the vicinity of the passive bioventing system lines. Carbon dioxide was detected in the vadose zone, which indicates that microbial activity is occurring. Because oxygen levels were not entirely depleted, there appears to be sufficient oxygen for additional microbial activity.

1.2. Purpose and Scope

The scope of work for long-term monitoring during 2013 is based on recommendations made in the document *2011 Long Term Monitoring Report, Port of Anchorage Terminal Facility* (OASIS 2011). The purpose of the 2013 biennial long-term monitoring event is to:

- Evaluate groundwater flow direction;
- Assess the current state and distribution of hydrocarbon constituents in groundwater monitoring wells;
- Monitor the bioventing system to determine if in situ remediation is occurring;
- Refine the Terminal's conceptual site model based on input of additional data gathered from the execution of this LTM Plan; and
- Demonstrate over time that the combination of bioventing and monitored natural attenuation is cleaning the site toward applicable Method 2 and Table C

(18 Alaska Administrative Code [AAC] 75) cleanup levels for soil and groundwater, respectively.

1.3. Project Organization

- Owner/Operator: Horizon Lines, LLC, 1717 Tidewater Road, Anchorage, Alaska, 99501
- Third-Party Environmental Assessor: ERM, 825 W. 8th Avenue, Anchorage, Alaska, 99501.
- ADEC Certified Laboratory: TestAmerica, 2000 W. International Airport Road, Suite A-10, Anchorage, Alaska, 99502

1.4. Regulatory Framework

This work plan has been developed in accordance with regulatory policy and standard practices as outlined in:

- 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control* (ADEC 2012);
- *Underground Storage Tanks Procedure Manual* (ADEC 2002); and
- *Policy Guidance on Developing Conceptual Site Models* (ADEC 2010a).
- *Draft Field Sampling Guidance* (ADEC 2010b)

The contaminants of concern (COCs) associated with this project include benzene, toluene, ethylbenzene, and total xylenes (BTEX), GRO, DRO, and polycyclic aromatic hydrocarbons (PAHs). Analytical results for groundwater samples are evaluated using ADEC's GCLs as presented in Table C of 18 AAC 75.345. Table 1 presents the applicable GCLs.

TABLE 1. GROUNDWATER CLEANUP LEVELS FOR CONTAMINANTS OF CONCERN

Analyte	GCL[1] [mg/L]
benzene	0.005
toluene	1.0
ethylbenzene	0.7
xylenes	10
GRO	2.2
DRO	1.5
naphthalene	0.73
1-methylnaphthalene	0.15
2-methylnaphthalene	0.15
benzo(a)pyrene	0.0002
dibenzo(a,h)anthracene	0.00012

[1]GCLs per 18AAC75.345 (July 2012)

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2. FIELD ACTIVITIES

During October of 2013, ERM performed the following activities at the terminal facility:

- Monitoring well repair and survey verification were completed during the monitoring event.
- Groundwater elevations were measured using an oil-water interface probe.
- Water quality parameters were evaluated.
- Groundwater samples were collected using low-flow sampling techniques.
- Groundwater samples were submitted to a commercial laboratory for analysis.
- Bioventing system monitoring was conducted.

The work was performed in accordance with the work plan (ERM 2013), unless otherwise noted. Field notes and data sheets are included in Appendix A. All samples were collected by ERM personnel who meet the definition of qualified persons per 18 AAC 75.990(100).

2.1. Monitoring Well Repair and Survey

ERM personnel conducted the biennial groundwater monitoring effort 25 October 2013. Prior to sampling, repairs were completed to wells that had been damaged by frost-jacking. Well repairs included:

- Trimming the well casing at wells HC-3, HC-2B, MW-9, MW-11, MW-10 and
- Replacement of damaged monuments at wells HC-1, MW-9 and MW-11.

HC-1 was found with no cap and could have been impacted by potential surface water infiltration. Following repairs, the monitoring well top-of-casing (TOC) elevations were re-surveyed. Following repair and surveying, a depth-to-groundwater measurement and a total-well-depth measurement were recorded at each functional well using an oil-water interface probe. Total well depths were measured to calculate the water column thickness.

2.2. Groundwater Sampling

ERM sampled the wells using low-flow sampling techniques. This process included purging groundwater at less than 1 liter per minute using a peristaltic pump, passing groundwater through a flow-through cell, monitoring for water quality parameters using a YSI 556 water quality meter , and sampling after water quality parameters had stabilized.

The wells that were sampled during this field event are HC-1, HC-3, HC-6, MW-8 and MW-10. Previous sampling event results have indicated that monitoring wells HC-2B, HC-4, HC-5 and MW-11 are not impacted by petroleum hydrocarbons. Sampling has

been discontinued at MW-9 because the concentrations in the well exhibit statistically significant decreasing trends, and MW-9 is in the direct vicinity of two other wells (MW-8 and HC-1) which have historically exhibited higher COC concentrations than MW-9.

Groundwater monitoring event sampling took place in accordance with sampling procedures outlined in ADEC's *Underground Storage Tanks Procedure Manual* (ADEC 2002). Monitoring wells were purged until at least three casing volumes of water had been removed from the well, or until a minimum of three (minimum of four, if using temperature as an indicator) of the parameters listed on the *Low-Flow Groundwater Sampling Worksheets* had stabilized. *Low-Flow Groundwater Sampling Worksheets* from the sampling effort are provided in Appendix A. The water quality parameters including dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, temperature, and conductivity were measured using a YSI-556 water quality meter.

Water samples collected for laboratory analysis were immediately placed in a cooler along with frozen gel ice. Samples were delivered to TestAmerica, an ADEC-approved laboratory, and analyzed for BTEX, GRO, DRO and PAHs. Stable parameters were not reached at MW-10, and a DRO sample was not taken due to an insufficient volume of water in the well and slow recharge. MW-10 does not have a history of exceeding ADEC GCLs. A summary of wells sampled is provided in Table 2, below.

TABLE 2. WELLS SAMPLED 10/25/13

Well	GRO/BTEX	DRO	PAHs
HC-1	X	X	-
HC-2B	-	-	-
HC-3	X	X	-
HC-4	-	-	-
HC-5	-	-	-
HC-6	X	X	-
MW-8	X	X	X
MW-9	-	-	-
MW-10	X	Note 1	-
MW-11	-	-	-

Note 1: DRO sampling was planned for MW-10, but DRO was not sampled due to insufficient groundwater availability

2.3. Bioventing System Monitoring

The bioventing system is composed of six slotted PVC lines, which are buried horizontally in the footprints of the former USTs and filling stations (Figure 3). The lines surface at the maintenance facility wall and extend up the exterior of the building to the outlet through fans on the roof.

During the 2013 monitoring event, ERM personnel inspected and tested the bioventing system. Total volatile hydrocarbons, oxygen, and carbon dioxide levels were monitored.

A sampling pump was connected to the sample port on each of the six lines via single-use polyethylene tubing. Approximately 0.25 cubic feet per minute (cfm) of soil gas was extracted from each line for approximately four minutes to allow thorough evacuation of any static vapors in the line. After sufficient evacuation, an RKI Eagle multi-gas meter (with LEL calibrated to oxygen, carbon dioxide, and hexane standards) was connected to the pump effluent to monitor the soil gas oxygen, carbon dioxide, and total volatile hydrocarbon (TVH) content.

All six of the roof-top bioventing system fans were observed spinning during the 2013 monitoring event.

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3. RESULTS AND DISCUSSION

This section presents the findings from work performed as part of the long-term monitoring plan. Appendix B contains the analytical data reports.

3.1. Groundwater Elevation and Flow Direction

ERM recorded the total well depth and depth-to-water measurements prior to sampling. No light non-aqueous phase liquid (LNAPL) was measured in any of the site wells. The groundwater measurements were used to calculate relative groundwater elevation data compared against an assumed benchmark elevation of 100 feet at a reference point previously established by professional surveyors, Bell and Associates. The groundwater elevation data is presented in Table 3 and Figure 3. The inferred groundwater flow direction is to the south at a gradient of 0.08 ft/ft, which is consistent with previous monitoring events.

3.2. Water Quality Results

Water quality parameter results are consistent with the results of recent monitoring events. Parameters collected from MW-10 are not included in these results due to insufficient purge water availability. Temperature readings ranged from 6.68 to 9.68 degrees Celsius (44.0 to 49.4 degrees Fahrenheit). The DO readings from most wells ranged between 0.32mg/L and 0.37mg/L, with a reading from MW-08 at 1.7mg/L. In recent years wells have generally reported DO concentrations at or below 1.0 mg/L. Conductivity ranged from 2,326 to 3,899 microsiemens per centimeter, which is slightly saline. The groundwater pH levels were slightly acidic, ranging from 6.0 to 6.61, and ORP results ranged from -44.6 to -6.2 millivolts.

The 2013 analytical sample results for the BTEX, GRO and DRO are summarized in Table 44. Figure 4 displays the 2013 groundwater sampling results at each location. Review of results of the laboratory analysis indicate that:

- Benzene concentrations exceeded the GCL in source area wells (MW-8 and HC-1) and down-gradient well MW-10;
- Ethylbenzene and xylene exceeded their respective GCL concentrations in source area well MW-8;
- DRO concentrations exceeded the GCL in source wells MW-8 and HC-1, and down-gradient well HC-6; and
- GRO concentrations exceeded the GCL in source area wells MW-8 and HC-1.

Review of the analytical results for samples collected from up-gradient well HC-3 indicate that concentrations were below cleanup levels for all analytes.

In general, sample concentrations are consistent with data from previous years. Table 6 presents cumulative groundwater analytical results from 2000 to 2013. The wells positioned in the vicinity of the former USTs (HC-1, MW-8 and MW-9) exhibited concentrations above GCLs. The down-gradient wells (HC-6 and MW-10) contained petroleum concentrations above GCLs, and up-gradient well HC-3 exhibited concentrations below GCLs.

DRO results for every sample collected from MW-8 since the well was installed in 2005 have exceeded the diesel solubility limit of 3.9 mg/L (API 2000). This observation suggests that groundwater in the source area is in contact with LNAPL. However, LNAPL has never been observed in this well and no product or sheen was observed during the UST removal.

The results for the PAH sample collected from MW-8 are shown in Table 5. All analyte concentrations were either below the method reporting limit (MRL) or detected below the respective GCL. The MRLs were above the one-tenth screening level for benzo(a)pyrene and dibenzo(a,h)anthracene. Benzo(a)pyrene and dibenzo(a,h)anthracene will remain as COCs until further analytical results show that they are not detected above the screening level.

3.3. Bioventing System Monitoring

Table 7 presents the cumulative monitoring results of the bioventing system includeing the results from the October 25, 2013 monitoring event. The level of carbon dioxide readings remain well above the atmospheric background of 0.038%, which suggests that respiration from microbial activity is occurring in the vadose zone. However, the carbon dioxide concentrations were slightly lower in 2013 than in recent years, indicating that less respiration from microbial activity is occurring. Oxygen levels were slightly higher in 2013 than in recent years, indicating that microbial activity is not depleting oxygen below levels necessary for aerobic biodegradation. TVH measurements at lines 1 and 3 indicate that contaminant vapors remain present in the vadose zone soil.

4. QUALITY ASSURANCE REVIEW

An ADEC Laboratory Data Review Checklist was completed to evaluate the quality of laboratory reports of analytical data for the samples collected during the 2013 monitoring activities. The ADEC Laboratory Data Review Checklist (ADEC 2010c) is provided in Appendix C. Per ADEC's *Technical Memorandum on Environmental Laboratory Data and Quality Assurance Requirements*, the quality assurance summary (below) describes quality assurance parameters and the impact that any discrepancies have on the quality and usability of the data.

Groundwater samples were analyzed for the following parameters:

- DRO by AK102
- GRO by AK101
- BTEX by EPA8021B
- PAHs by 8270SIM

4.1. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with "true values" established by spiking applicable samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs and MS/MSDs for this project. Recoveries and RPDs for all LCS/LSCD and MS/MSD samples were within required limits.

4.2. Representativeness

Groundwater samples were collected after stabilization had occurred to ensure that formation water is being sampled. One trip blank was included per analysis. This data is representative of the actual site conditions and consistent with the Quality Assurance Project Plan outlined in the work plan.

4.3. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

% completeness = number of valid (i.e., non-R flagged) results/number of possible results

All requested analyses were performed in accordance with work plan specifications. No results were qualified as rejected. Some results are considered estimated due to quality control criteria not being met. The completeness for this project is 100%.

4.4. Sensitivity

In accordance with reporting conventions, the reported practical quantitation limits (PQLs) are less than the cleanup level or the minimum required detection level for the project, with the exception of dibenzo (a,h) anthracene. The MRL is 0.00022 mg/L, which is above the ADEC cleanup level of 0.00012 mg/L. However, the MDL of 0.00011 mg/L is below the ADEC cleanup level for this compound. Method blanks were less than the PQL.

4.5. Data Summary

In general, the overall quality of the data was acceptable. Overall, data quality met the data quality objectives established in the work plan for this project. The associated sample results are usable for the purpose of this investigation.

5. CONCEPTUAL SITE MODEL

The data from the 2013 monitoring event was evaluated in order to update the conceptual site model (CSM) for the site. The CSM was completed in accordance with the ADEC CSM Policy Guidance, updated in October 2010 (CSM guidance document). No new receptors or exposure pathways were identified in 2013, so the CSM graphical and scoping forms completed in 2011 are applicable and are presented in Appendix D.

The CSM scoping form in Appendix D outlines the current and future receptors for the property. Access to the site is restricted to Horizon personnel and approved visitors. The current and future receptors of all completed pathways at the site consist of commercial or industrial workers, site visitors or trespassers, and construction workers.

The source area includes the petroleum contaminated soil and groundwater in the vicinity of the three USTs that historically supplied fuel to the fueling canopy. The complete exposure pathways are:

- Incidental soil ingestion,
- Dermal absorption of contaminants from soil,
- Dermal absorption of contaminants from groundwater,
- Ingestion of groundwater, and
- Inhalation of indoor and outdoor air.

The site is paved with asphalt, which prevents current contact with the subsurface soil, groundwater and soil gas. The incidental ingestion, dermal absorption and inhalation of outdoor air pathways could potentially affect future receptors in the case that the asphalt were removed.

Naphthalene, a constituent in diesel fuel, is included in the chemicals noted for potential dermal absorption exposure (Appendix B of the ADEC CSM guidance document). Naphthalene was detected in excess of this screening level (one-tenth of the applicable cleanup level) at MW-8. Therefore, the dermal exposure pathway is considered complete at the site.

The nearest surface water body, the Cook Inlet, is not recognized as a current or potential future drinking water source, so the ingestion of surface water pathway is considered incomplete. The ingestion of wild foods pathway does not exist because the site is industrial and secured, which prevents the harvest and ingestion of wild foods.

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6. CONCLUSIONS AND RECOMMENDATIONS

The results of the 2013 groundwater monitoring event indicate that the contaminant plume continues to attenuate and is not migrating offsite. Groundwater hydrocarbon concentrations continue to exceed GCLs, especially in wells located in the vicinity of the former UST excavation. While LNAPL has not been measured in site wells, the DRO concentration in well MW-8 is above the solubility limit of 3.9 mg/L, which suggests that LNAPL may be present in the subsurface in the source area.

Monitoring of the bioventing system continues to show that in the vicinity of the passive bioventing system lines, conditions support the aerobic biodegradation of volatile hydrocarbons. The carbon dioxide concentrations remain above background levels and oxygen concentrations remain sufficient to support aerobic biodegradation in the vadose zone.

Based on the results of the 2013 long term monitoring plan, it is recommended that during the 2015 monitoring event, the field team should limit the purge volume at MW-10 to ensure that sufficient volume is available for sample collection.

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7. REFERENCES

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TABLES

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TABLE 3: GROUNDWATER ELEVATION MEASUREMENTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Monitoring Well	Relative TOC[1,2] Elevation (Feet)	Depth to Groundwater (Feet)	Relative Groundwater Elevation (Feet)
HC-1	97.68	6.84	90.84
HC-2B	97.31	5.94	91.37
HC-3	99.12	6.76	92.36
HC-4	99.29	7.56	91.73
HC-5	97.72	9.15	88.57
HC-6	97.83	9.19	88.64
MW-8	98.18	6.03	92.15
MW-9	97.26	5.20	92.06
MW-10	96.88	6.13	90.75
MW-11	96.46	5.76	90.7

Notes:
1. Relative TOC established by ERM on 10/25/2013.
2. TOC = top of casing

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TABLE 4: GROUNDWATER ANALYTICAL RESULTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Monitoring Well	Petroleum Hydrocarbon Concentration [mg/L]					
	AK 101					AK 102
	Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO
ADEC Groundwater Cleanup Level[3]	0.005	1.0	0.7	10	2.2	1.5
HC-1	**0.737**	ND (0.005)	0.0893	0.159	**2.26**	**2.95**
HC-3	0.002	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	0.848
HC-6	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	**1.54**
MW-8	**1.38**	0.13	**1.51**	**11**	**24.1**	**17.7**
MW-Z (Duplicate of MW-8)	**1.43**	0.138	**1.63**	**12**	**27.4**	**15.2**
MW-10	**0.00503**	0.00115	0.00857	0.0707	0.137	NS[2]

Notes:
1. Value in parantheses is the laboratory reporting limit.
2. MW-10 not sampled for DRO due to limited purge volume
3. Groundwater cleanup Levels from 18 AAC 75.345, Table C (2012)

Key:
ADEC = Alaska Department of Environmental Conservation
Bold = Concentrations above ADEC Groundwater Cleanup Levels (18 AAC 75)
DRO = Diesel range organics
GRO = Gasoline range organics
mg/L = milligrams per liter
ND = Not detected above the reporting limit shown in parentheses

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TABLE 5: GROUNDWATER ANALYTICAL RESULTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Analyte	PAH Concentration[2] (mg/L)		ADEC Cleanup Level[1] (mg/L)
	MW-8	MW-Z (Duplicate of MW-8)	
1-Methylnaphthalene	0.047	0.05	0.15
2-Methylnaphthalene	0.075	0.079	0.15
Benzo (a) pyrene	ND (0.00011)	ND (0.00011)	0.0002
Dibenzo (a,h) anthracene[4]	ND (0.00022)	ND (0.00022)	0.00012
Naphthalene	0.210	0.220	0.73

1. Groundwater cleanup levels from 18 AAC 75.345, Table C (2012)
2. Samples were analyzed by method 8270C SIM
3. Value in parantheses is the method reporting limit (MRL)
4. The MRL is 0.00022 mg/L, which is above the ADEC cleanup level of 0.00012 mg/L. However, the MDL of 0.00011 mg/L is below the ADEC cleanup level for this compound.

Key:
ADEC = Alaska Department of Environmental Conservation
Bold = Concentrations above ADEC Groundwater Cleanup Levels (18 AAC 75)
mg/L = milligrams per liter
ND = Not detected above the reporting limit shown in parentheses
PAH = Polyaromatic hydrocarbon

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TABLE 6: CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Monitoring Well	Date of Sample	Hydrocarbon Concentrations (mg/L)					
		Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO
ADEC GW Cleanup Level	2013	0.005	1.0	0.7	10	2.2	1.5
G-1-96	Nov-02	ND (0.0005)	ND (0.002)	ND (0.002)	ND (0.004)	ND (0.09)	ND (0.556)
HC-1	Oct-2000	**8.06**	0.567	0.678	3.865	**27.7**	**6.27**
	Nov-2002	**7.55 J**	0.021 J	**0.916 J**	4.081 J	**24.8 J**	**6.78**
	Nov-2004	**6.42**	0.023	**0.816**	3.03	**21.6**	**10.7**
	Mar-2005	**3.76**	0.009	0.507	1.76	**14.3**	**7.64**
	Nov-2005	**2.34**	0.00581	0.307	1.08	**11.1**	**6.53**
	Apr-2006	**1.94**	0.00597 J	0.305	1.04	**8.25**	**4.94**
	Nov-2006	**2.21**	ND (0.025)	0.269	0.604	**9.35**	**6.85**
	Apr-2007	**1.7**	ND (0.005)	0.228	0.527	**6.62**	**4.88**
	Oct-2007	**1.25**	ND (0.005)	0.157	0.232	**4.39**	**6.05**
	Apr-2008	**0.653**	ND (0.005)	0.0758	0.165	1.73	1.31
	Jun-2009	**0.734**	0.00275 J	0.19	0.282	**2.73 J**	**3.86**
	Oct-2010	**1.05**	0.0037	0.600	4.76	**1.93**	**2.70**
	Aug-2011	**0.875**	0.000827	0.146	0.228	**3.650**	**2.51**
	Oct-2013	**0.737**	ND (0.005)	0.0893	0.159	**2.26**	**2.95**
HC-2B	Oct-00	0.0012	ND (0.002)	0.005	0.069	0.310	**3.61**
	Nov-02	0.0006	ND (0.002)	0.004	0.049	0.310	**1.55**
	Nov-04	0.0016	ND (0.0005)	0.0049	0.079	0.280	**2.5**
	Mar-05	0.0005	ND (0.0005)	0.0021	0.014	0.110	**1.55**
	Nov-05	0.000904	ND (0.0005)	0.00399	0.0499	0.232	1.36
	Apr-06	ND (0.0005)	ND (0.0005)	0.00201	0.0233	0.138	1.11
	Nov-06	ND (0.0005)	ND (0.0005)	0.000871	0.0169	0.159	1.29
	Apr-07	ND (0.0005)	ND (0.0005)	0.0011	0.013	0.111	0.863
	Oct-2007	NS	NS	NS	NS	NS	**1.57**
	Apr-2008	NS	NS	NS	NS	NS	1.06
	Jun-2009	NS	NS	NS	NS	NS	1.14
HC-3	Oct-00	**0.0244**	ND (0.002)	ND (0.002)	0.003	0.21	**2.18**
	Nov-02	**0.0107**	ND (0.002)	ND (0.002)	ND (0.0004)	ND (0.09)	0.82
	Nov-04	0.004	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	0.726
	Mar-05	**0.0068**	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.06	ND (0.394)
	Nov-05	**0.00566**	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.0665	0.68
	Apr-06	0.00315	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.0568	1.25
	Nov-2006	**0.00855**	ND (0.0005)	ND (0.0005)	ND (0.0015)	4	1.09
	Apr-2007	0.00322	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.0654	0.640
	Oct-2007	0.00262	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.0577	1.14
	Apr-2008	0.00432	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.205	1.05
	Jun-2009	**0.0088**	ND (0.001)	ND (0.001)	0.00677	0.207	**2.20**
	Oct-2010	0.00301	ND (0.001)	ND (0.001)	ND (0.003)	ND (0.050)	0.603
	Aug-2011	**0.00604**	ND (0.0005)	ND (0.0005)	ND (0.0015)	0.0552	0.931
	Oct-2013	0.002	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	0.848

TABLE 6: CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Monitoring Well	Date of Sample	Hydrocarbon Concentrations (mg/L)					
		Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO
HC-4	Aug-2011	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.050)	ND (0.385)
HC-5	Nov-02	ND (0.0005)	ND (0.0002)	ND (0.0002)	ND (0.0004)	ND (0.09)	0.668
	Nov-04	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	ND (0.431)
	Mar-05	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	**2.67**
	Nov-05	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	ND (0.391)
	Apr-06	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	ND (0.391)
HC-6	Nov-02	ND (0.0005)	ND (0.0002)	ND (0.0002)	ND (0.0004)	ND (0.09)	ND (0.581)
	Nov-04	0.004	ND (0.0005)	ND (0.0005)	0.002	ND (0.05)	0.949
	Mar-05	**0.0144**	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	**1.74**
	Nov-05	0.000502	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	0.468
	Apr-06	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	ND (0.417)
	Nov-06	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	**1.78**
	Apr-07	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	0.870
	Oct-07	NS	NS	NS	NS	NS	**2.86**
	Apr-08	NS	NS	NS	NS	NS	0.715
	Jun-09	NS	NS	NS	NS	NS	0.842
	Oct-10	NS	NS	NS	NS	NS	0.586
	Aug-2011	NS	NS	NS	NS	NS	1.40
	Oct-2013	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	**1.54**
MW-8	Nov-2005	**5.55**	**9.45**	**1.54**	**13.7**	**91.5**	**33.8**
	Apr-2006	**6.66**	**15.6**	**2.2**	**17.8**	**107**	**47.6**
	Nov-2006	NS	NS	NS	NS	NS	NS
	Apr-2007	**5.87**	**12.6**	**2.29**	**19**	**114**	**29.7**
	Oct-2007	**4.9**	**9.85**	**1.5**	**17.9**	**106**	**32.1**
	Apr-2008	**2.68**	**12.5**	**2.44**	**20.3**	**82.8**	**25.1**
	Jun-2009	**2.41**	**4.35**	**2.06**	**15.3**	**101**	**25.4 J-B**
	Oct-2010	**1.82**	**2**	**2.2**	**18.1**	**98.1**	**17.7**
	Aug-2011	**1.840**	0.287	**1.840**	**14.100**	**59.000**	**16.6**
	Aug-2011[1]	**1.780**	0.273	**1.770**	**13.700**	**59.600**	**20.4**
	Oct-2013	**1.38**	0.13	**1.51**	**11**	**24.1**	**17.7**
	Oct-2013[1]	**1.43**	0.138	**1.63**	**12**	**27.4**	**15.2**
MW-9	Nov-05	**5.20**	**1.02**	**1.63**	**10.1**	**56.2**	**33.3**
	Apr-06	**7.94**	0.742	**2.47**	**12.9**	**66**	**35.6**
	Nov-06	**7.40**	0.369	**2.2**	9.90	**61.1**	**21.9**
	Apr-07	**7.42**	ND (0.25)	**1.99**	9.54	**56.3**	**24.2**
	Oct-07	**8.16**	0.114	**1.36**	6.20	**45.6**	**21.0**
	Apr-08	**5.69**	0.062	**0.713**	3.19	**18.0**	**11.0**
	Jun-09	**1.90**	0.0137	0.0638	0.318	**3.77**	**9.00 J-B**
	Oct-10	**1.92**	0.017	0.54	4.46	**3.95**	**6.53**
	Aug-2011	**0.104**	0.00133	0.00607	0.0283	0.447	**2.08**
MW-10	Nov-06	0.00427	0.0017	0.0054	0.0322	0.133	0.761
	Apr-07	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	**2.03**
	Oct-07	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	ND (0.394)
	Apr-08	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	ND (0.427)

TABLE 6: CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Monitoring Well	Date of Sample	Hydrocarbon Concentrations (mg/L)					
		Benzene	Toluene	Ethylbenzene	Xylenes	GRO	DRO
	Oct-2013	**0.00503**	0.00115	0.00857	0.0707	0.137	NS
MW-11	Nov-06	**0.00629**	0.00136	0.00433	0.027	0.126	1.00
	Apr-07	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	1.06
	Oct-07	ND (0.0005)	ND (0.0005)	ND (0.0005)	ND (0.0015)	ND (0.05)	0.779
	Apr-08	NS	NS	NS	NS	NS	NS
	Jun-09	NS	NS	NS	NS	NS	ND (0.397) J-B

Notes:
1. Duplicate Sample
2. Value in parantheses is the laboratory reporting limit.

Key:
ADEC = Alaska Department of Environmental Conservation
Bold = Concentrations above ADEC Groundwater Cleanup Levels (18 AAC 75)
DRO = Diesel range organics
GRO = Gasoline range organics
mg/L = milligrams per liter
ND = Not detected above the reporting limit shown in parentheses

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TABLE 7: CUMULATIVE BIOVENTING SYSTEM MEASUREMENTS
2013 LONG-TERM GROUNDWATER MONITORING REPORT
PORT OF ANCHORAGE TERMINAL FACILITY

Line	Nov-06	Apr-07	Oct-07	Aug-09	Oct-10	Aug-11	Oct-13
Oxygen [%]							
1	20.1	17.6	16.0	19.1	19.0	20.3	20.6
2	18.3	15.1	12.8	15.3	15.2	17.3	19.4
3	16.4	16.4	14.5	17.4	16.6	18.7	20.9
4	20.9	20.9	13.6	16.6	16.5	18.1	20.9
5	20.9	14.5	12.5	15.3	16.2	16.2	19.5
6	13.5	18.1	17.9	16.5	18.2	17.8	20.1
Carbon Dioxide [%]							
1	0.3	1.8	3.4	1.3	1.3	1.5	1.2
2	2.0	3.0	5.5	4.0	4.1	3.7	1.7
3	3.2	2.2	4.3	2.4	3.2	2.5	0.4
4	0.3	0	4.6	2.9	3.6	3.0	1.24
5	0.9	3.0	5.7	4.0	3.8	4.7	1.6
6	4.5	1.6	1.9	3.4	2.1	3.3	1.4
Total Volatile Hydrocarbons [ppm]							
1	10	160	160	0	0	55	25
2	25	780	110	0	0	20	0
3	0	420	120	0	0	35	15
4	15	0	110	0	0	25	0
5	20	320	90	0	0	0	0
6	50	110	100	0	0	15	0

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FIGURES

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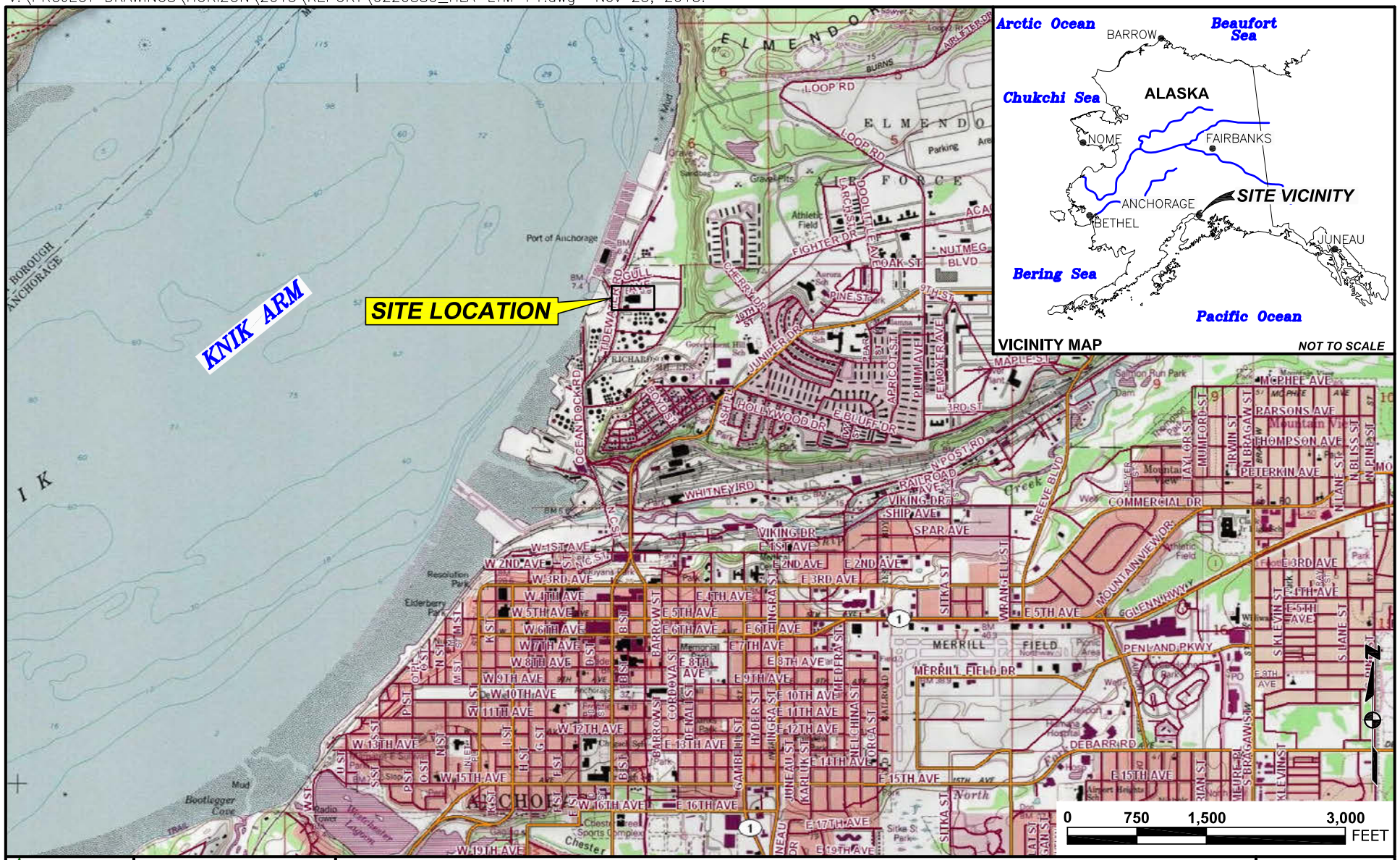

DATE:	NOV. 2013
CHKD:	K.J.
DRAWN:	D.R.F.
PROJ. No.:	0220880

ERM
825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

SITE LOCATION MAP

LONG-TERM MONITORING REPORT
HORIZON LINES OF ALASKA
Anchorage, Alaska

FIGURE
1

SOURCE: TOPO IMAGE FROM NATIONAL GEOGRAPHIC SOFTWARE 2006.

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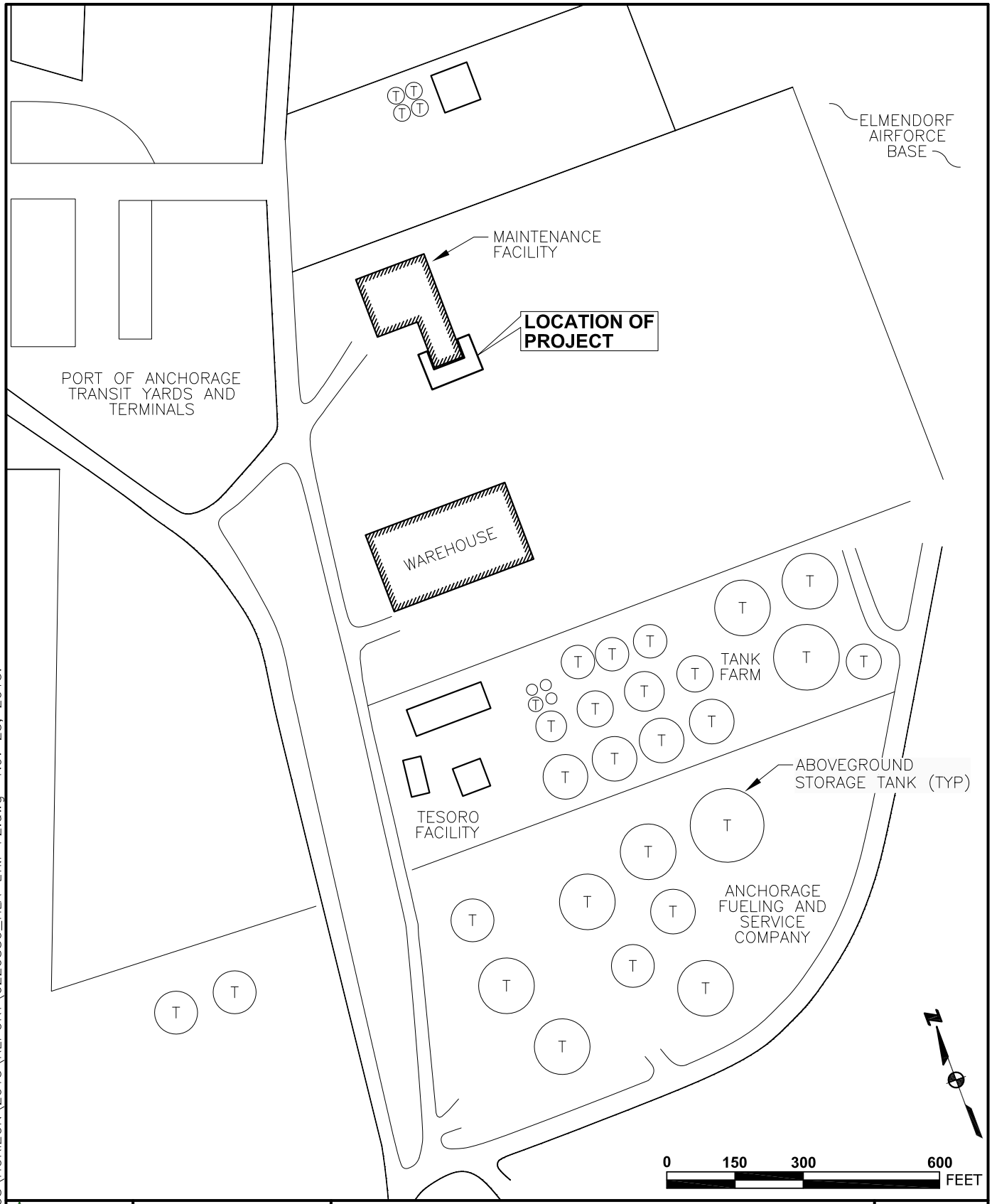

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ERM

DATE: NOV. 2013
CHKD: K.J.
DRAWN: D.R.F.
PROJ. No.: 0220880

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

SITE PLAN

LONG-TERM MONITORING REPORT
HORIZON LINES OF ALASKA
Anchorage, Alaska

FIGURE
2

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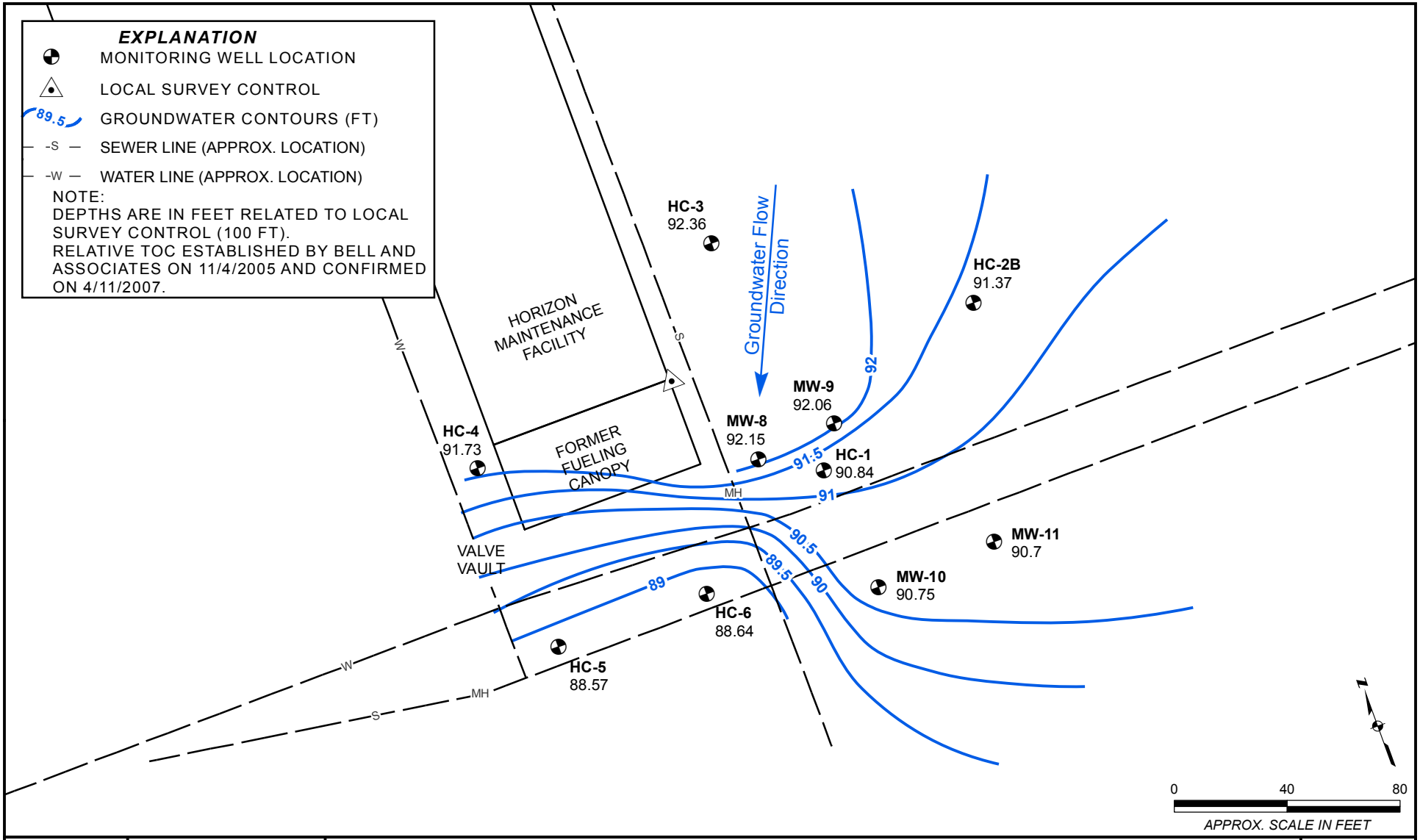

ERM

DATE: NOV. 2013
CHKD: B.D.A.
DRWN: W.C.K.
PROJ. No.: 0220880

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

PIEZOMETRIC SURFACE MAP (25 OCTOBER, 2013)

LONG-TERM-MONITORING REPORT
HORIZON LINES OF ALASKA
Anchorage, Alaska

FIGURE

3

M:\GIS\Projects\0220880_Horizon Lines\mxd\Horizon_GW_2013.mxd

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V:\PROJECT DRAWINGS\HORIZON\2013\0220880_HLA-LTM-F4.dwg Nov 25, 2013.

LEGEND

HC-1	MONITORING WELL LOCATION
GRO	GASOLINE-RANGE ORGANICS (mg/L)
DRO	DIESEL-RANGE ORGANICS (mg/L)
BTEX	BENZENE, TOLUENE, ETHYLBENZENE, XYLENES (mg/L)
ND	NOT DETECTED
NA	NOT ANALYZED
(NS)	NOT SAMPLED
J-S	ESTIMATED DUE TO SURROGATE RECOVERY FAILURE
--S--	SEWER LINE (APPROX. LOCATION)
--W--	WATER LINE (APPROX. LOCATION)

NOTE:
BOLD/RED TEXT INDICATES AN EXCEEDANCE OF ADEC GROUNDWATER CLEANUP LEVELS.

HC-3	8/2011	10/2013
GRO	0.0552	ND(0.05)
DRO	0.931	0.848
B	0.00604	0.002
T	ND	ND(0.0005)
E	ND	ND(0.0005)
X	ND	ND(0.0015)

MW-8	8/2011	(DUP.)	10/2013	(DUP.)
GRO	**59**	**59.6**	**24.1**	**27.4**
DRO	**16.6**	**20.4**	**17.7**	**15.2**
BENZENE	**1.84**	**1.78**	**1.38**	**1.43**
TOLUENE	0.287	0.273	0.130	0.138
ETHYLBENZENE	**1.84**	**1.77**	**1.51**	**1.63**
XYLENES	**14**	**13.7**	**11**	**12**
1-Methylnaphthalene	28 J-S	23.2 J-S	0.047	0.050
2-Methylnaphthalene	38.3 J-S	32.6 J-S	0.075	0.079
Benzo(a)pyrene	ND(0.0330)	ND(0.0326)	ND(0.00011)	ND(0.00011)
Dibenzo(a,h)anthracene	ND(0.0330)	ND(0.0326)	ND(0.00022)	ND(0.00022)
Naphthalene	138 J-S	108 J-S	0.21	0.22

HC-2B (NS)

MW-9	8/2011	10/2011
GRO	0.447	NS
DRO	**2.08**	NS
B	**0.104**	NS
T	0.00133	NS
E	0.00607	NS
X	0.0283	NS

HC-1	8/2011	10/2013
GRO	**3.65**	**2.26**
DRO	**2.51**	**2.95**
B	**0.875**	**0.737**
T	0.000827	ND(0.005)
E	0.146	0.0893
X	0.228	0.159

HC-4 (NS)

FORMER FUELING CANOPY

MW-11 (NS)

VALVE VAULT

HC-5 (NS)

HC-6	8/2011	10/2013
GRO	NA	ND(0.05)
DRO	**1.40**	**1.54**
B	NA	ND(0.0005)
T	NA	ND(0.0005)
E	NA	ND(0.0005)
X	NA	ND(0.0005)

MW-10	8/2011	10/2013
GRO	NS	0.137
DRO	NS	NS
B	NS	**0.00503**
T	NS	0.00115
E	NS	0.00857
X	NS	0.0707

CHERRY HILL STORM DRAIN

MANHOLE (TYP)

MH

W

S

0 20 40 80 FEET

ERM

DATE: NOV. 2013
CHKD: K.J.
DRAWN: D.R.F.
PROJ. No.: 0220880

825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

ANALYTICAL RESULTS

LONG-TERM MONITORING REPORT
HORIZON LINES OF ALASKA
Anchorage, Alaska

FIGURE
4

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APPENDIX A

Field Notes

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0146958

New file #
022080
2013 Proj #

Horizon Lines
GW Monitoring
Anchorage, AK
OASIS # 271-001

4 5/8" x 7" - 64 Pages

K. JOHNSON
S. CHRISTIAN

10/24/13 HORIZON LINES A. DUCOMB

7:30 - ARRIVE ONSITE
- WEATHER: OVERCAST, APPROX 50°F
- MEET WITH WAYNE AND TONY DAVENPORT
- CONDUCT TAILGATE SAFETY MEETING AND REVIEW HSE

8:30 BEGIN MONITORING OF BIOVENT LINES.
- PHOTOS 1747-1750 - SYSTEM SETUP

LINE	HEX (ppm)	O_2 (%)	CO_2 (%)	
1	25	20.6	1.2	(LEFT LINE)
2	0	19.4	1.7	
3	15	20.9	0.4	
4	0	20.9	1.24	
5	0	19.5	1.60	
6	0	20.1	1.40	
BACKGROUND	0	20.1	0.04	

- PURGE EACH LINE 4 min, 15

9:10 BATTERIES REPLACED - RUN BACK TO OFFICE. RESUME PURGING LINES FOR REMAIN. 2 MINUTES AT 10:30

11:06 BIOVENT MONITORING COMPLETE

10/24/13 HORIZON LINES S. CHRISTIANSON A. DUCOMB

12:00 TAKE GW ELEVATION (DTW) MEASUREMENTS

~~INTERFACE PROBE TAPE BENT~~

~~MW~~	~~DTW~~	~~ID~~
~~HC-3~~	~~3.87~~	
~~HC-2B~~	~~4.05~~	~~5.95~~

- NEW INTERFACE PROBE

	WELL	DTW	ID	
1:15	HC-6	9.19	13.87+	
	HC-2B	5.94	13.56	~~NEEDS BOLT~~
	MW-9	5.20	7.03	
	MW-11	5.76	10.20	NEEDS NEW LID
	HC-5	9.15	14.65	OILY RESIDUE
1:50	HC-4	7.56	13.65	@ ~~BOTTOM~~
	MW-10	6.13	9.62	
	HC-1	6.84	13.31	
	MW-8	6.03	9.97	
	HC-3	6.76	13.24	

- DTW MEASUREMENTS FROM NORTH SIDE OF PVC
- PHOTO 1755 OF MW11

10/24/13 HORIZON LINES

13:25 BEGIN SETUP AT HC-6
SEE LOW-FLOW DATA SHEETS FOR SAMPLING DATA
SAMPLE FOR GRO/BTEX & DRO

14:23 BEGIN SETUP AT MW-10
WATER FULL OF SEDIMENT
PURGED DRY - RETURN TO SAMPLE AFTER RECHARGE

15:30 SETUP AT HC-1 AND MW-08. SEE DATA SHEETS FOR SAMPLING INFO

16:00 SET UP AT HC-3
SEE SAMPLING DATA SHEET

16:30 SET UP AT MW-10
SEE SAMPLING DATA SHEETS

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CONTENTS

PAGE	REFERENCE	DATE

A. Ducoma
S. Christianson

24-OCT-2013

0800 ERM onsite Begin
Locating / opening monuments, cutting casings + replacing monuments and/or lids if needed
→ HC-3 remove 0.08' of casing
→ HC-2B remove 0.09'
→ MW-9 remove 0.39' replace monument
→ HC-1 well found with no cap, possible surface water infiltration during recent rain events. remove 0.21' of casing + replace cap + monument lid
→ MW-8 Good
→ MW-11 remove 0.21', replace monument lid
→ MW-10 remove 0.31'
→ HC-6 Good
→ HC-5 "
→ HC-4 "
Find old well northwest of HC-5, monument torn (fluted) off skirt. Monument is set in concrete. Contact B. Authier about fixing (Any some quick patch

24-OCT-2013

Rite in the Rain

M. Lines

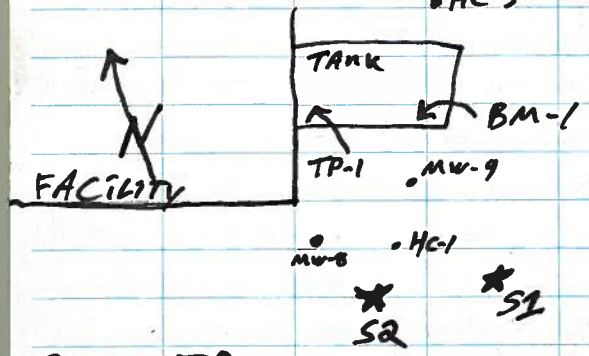
24-OCT-2013

CONT. And re-Seat Monument Lid.

1230 Begin Survey

ROD : S. CHRISTIANSON

Shoot: A. DUCOMB



BM-1 + TP-1 on Corners of concrete PAD for Fuel TANK.

STA	BS (+)	HI	FS(-)	Elev. (FT)
BM-1	1.77	101.77		100.00
HC-3			2.65	
HC-2B			4.46	
MW-9			4.51	
HC-1			4.09	
MW-8			3.59	
MW-11			5.31	
MW-10			4.89	
HC-6			3.94	

24-OCT-2013

M. Lines

24-OCT-2013

CONT;

STA	BS (+)	HI	FS(-)	Elev. (FT)
HC-5			4.05	
HC-4			2.48	
TP-1	1.94	101.93	1.78	99.99
BM-1			1.94	99.99

24-OCT-2013

Rain.

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW-08
Project # : 220880
Date: 10-24-13
Project Name: HORIZON LINES CLIM
Start Time: 15:30
Site: HORIZON LINES
End Time: 16:30
Field Team: K. JOHNSON
Sample ID: 13-HLA-MW-08-1003 Time: primary dup split ms/msd
Sample ID: 13-HLA-MW-2-1004 Time: 1800 primary dup split ms/msd
Weather Conditions: 50° OVERCAST

Depth to Top of Product (ft BTOC): —
Depth to Water (ft BTOC): 6.03
Depth to Oil/Water Interface* (ft BTOC): —
Total Depth (ft BTOC):
* Note: Same as depth to water
Final Depth (ft BTOC):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	
pH	0-14	± 0.1	
Conductivity	0-99999 µS/cm	± ~~5%~~ 3%	
ORP	± 1999 mV	±10mV	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	±10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flow Rate (ml/min)	Time	Temp °C	Spec. Cond. (mS/cm^C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
~~420~~	~~15:45~~	9.71	3.155	2235	5.0	6.31	48.8	clear	none	~~6.03~~	
420	15:50	9.64	3.238	2289	2.7	6.42	20.4	clear	none	6.03	0.00
"	15:55	9.67	3.269	2311	2.5	6.45	4.6	clear	none		
"	16:00	9.68	3.289	2320	1.7	6.48	-6.2	clear	none		

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
GRO/BTEX	6	HCL Vials	
DRO	4	25 mL	
PAH	4	1 L	

Signed: [signature] Date: 10-24-13
Signed/reviewer: Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW-10
Project #: 0220890
Date: 10-24-13
Project Name: HORIZON LINES - LONG
Start Time: ~~7:55~~ 14:30
Site: HORIZON LINES
End Time:
Field Team: K JOHNSON, S. CHRISTIANSON, A. DUCOMB
Sample ID: 13-HLA-MW-10-10006 Time: 16:30 primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Weather Conditions: 50° OVERCAST

Depth to Top of Product (ft BTOC): NO PRODUCT
Depth to Oil/Water Interface* (ft BTOC): ~~6.13~~
* Note: Same as depth to water
Depth to Water (ft BTOC): 6.13
Total Depth (ft BTOC): 9.62
Final Depth (ft BTOC):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	
pH	0-14	± 0.1	
Conductivity	0-99999 µS/cm	± ~~5%~~ 3%	
ORP	± 1999 mV	± 10mV	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flow Rate (ml/min)	Time	Temp °C	Spec. Cond. (mS/cm^C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
	~~17:00~~	~~6.7~~	~~0.10~~							9.08	
	17:00	8.6	0.375	260	94.3	7.77	-12.3	brown	NA		

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
GRO/BTEX	2	VOA, HCl	Well purged dry, insufficient water for DRO sample or Stable parameters

Signed: [signature] Date: 10-24-13
Signed/reviewer: Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: HC-03
Project # : Horizon Lines AK
Date: 10/24
Project Name: long term Monitoring
Start Time: 1615
Site:
End Time:
Field Team: S. Christiansen K. Johnson
Sample ID: 18-HLA-HC-03-1005 Time: 1645 primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Weather Conditions: Cloudy 30~

Depth to Top of Product (ft BTOC):
Depth to Oil/Water Interface* (ft BTOC):
* Note: Same as depth to water
Depth to Water (ft BTOC):
Total Depth (ft BTOC):
Final Depth (ft BTOC):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	
pH	0-14	± 0.1	
Conductivity	0-99999 µS/cm	± 5%	
ORP	± 1999 mV		
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU		

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flow Rate (ml/min)	Time	Temp °C	Spec. Cond. (mS/cm^C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
160	1625	7.31	6.239	4132	3.51	5.91	-6.1	Clear	no		
	1630	7.60	6.167	4117	1.14	5.92	-14.4				
	1635	7.97	5.888	3972	0.91	6.01	-29.2				
160	1640	8.02	5.802	3921	0.52	6.06	-39.2				
	1645	8.08	5.770	3906	0.43	6.12	-42.7				
	1650	8.08	5.761	3899	0.37	6.16	-44.6	Clear	no		
	~~1655~~										
	~~1700~~										

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
DRO	2	250 ml HCl	great recharge
GRO/BTEX	3	40 ml HCl	

Signed: Sarah Christensen
Date: 10/24
Signed/reviewer:
Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: HC-01
Project # : Horizon Lines AK
Project Name: long term Monitoring
Site:
Date: ~~10/~~ 10/24
Start Time: 1530
End Time: 1610
Field Team: S. Christiansen Kate Johnson
Sample ID: 13-HLA-HC-01-1002 Time: 1615 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Weather Conditions:

Depth to Top of Product (ft BTOC):
Depth to Oil/Water Interface* (ft BTOC):
* Note: Same as depth to water
Depth to Water (ft BTOC): 6.84
Total Depth (ft BTOC): 13.31
Final Depth (ft BTOC):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	
pH	0-14	± 0.1	
Conductivity	0-99999 µS/cm	± ~~5%~~ 3%	
ORP	± 1999 mV	± 10 mV	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	± 10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, (Grey), Milky White, Other:
Odor: (None), Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: (None), Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flow Rate (ml/min)	Time	Temp °C	Spec. Cond. (mS/cm^C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
~~150~~	1540	8.69	3.892	2676	0.80	6.18	-19.2	grey	no		
	1545	8.75	3.705	2555	0.56	5.83	-24.8	"	"		
	1550	8.72	3.576	2440	0.41	5.52	-28.8	clear			
	1555	8.83	3.539	2445	0.33	5.78	-33.3				
	1600	8.77	3.524	2431	0.33	5.93	-35.3				
	1605	8.76	3.501	2414	0.32	6.0	-35.6				

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
DRO	2	HCl	great recharge
GRO BTEX	3	HCl	

Signed: Sarah Christiansen Date: 10/24
Signed/reviewer: Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: HC-6
Project # : HLA
Date: 10/24/13
Project Name: Long term Monitoring
Start Time: 1325
Site:
End Time:
Field Team: S. Christiansen K. Johnson
Sample ID: ~~13-HC~~ 13-HLA-HC-06-1001 Time: 1400 primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Weather Conditions: Cloudy ~35°

Depth to Top of Product (ft BTOC): NA
Depth to Oil/Water Interface* (ft BTOC):
* Note: Same as depth to water
Depth to Water (ft BTOC): 9.19
Total Depth (ft BTOC): 13.87
Final Depth (ft BTOC):

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.5 °C	
pH	0-14	± 0.1	
Conductivity	0-99999 µS/cm	~~± 5%~~ ± 3%	
ORP	± 1999 mV	±10 mV	
Dissolved Oxygen	0-19.99 mg/L	± 10%	
Turbidity	0-800 NTU	±10%	

Sensory Observations

Color: Clear, Amber, Tan, Brown, Grey, Milky White, Other:
Odor: None, Low, Medium, High, Very Strong, H2S, Fuel Like, Chemical ?, Unknown
Turbidity: None, Low, Medium, High, Very Turbid, Heavy Silts

Instrument Observations

Flow Rate (ml/min)	Time	Temp °C	Spec. Cond. (mS/cm^C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
~~150~~ 160	1330	6.66	4.66/~~2677~~	2677	1.22	6.07	91.4	grey	NA		
	1335	6.64	4.269	2777	1.01	6.21	60.2				
160	1340	6.72	4.637	3024	1.07	6.34	20.1				
	1345	6.68	4.941	3212	0.77	6.41	-8.5	grey	NA		
	1350	6.68	5.006	3254	0.62	6.46	-18.1	clear	NA		
	1355	6.63	4.9~~65~~	3211	0.57	6.52	-19.2			9.22	0.03
	1400	6.70	5.~~943~~	3869	0.46	6.49	-46.0				
	1405	6.68	5.750	3722	0.43	6.55	-52.5				
160	1410	6.64	4.297	2789	0.49	6.63	-47.9	clear			
	1413	6.68	4.327	2814	0.43	6.63	-42.2				
	1416	6.72	4.50	2952	0.40	6.60	-40.8				
	1420	6.68	4.822	3131	0.36	6.61	-43.5	clear	None		

Notes: Drawdown should be less than 0.3 feet while sampling. Minimal drawdown shall be achieved and measured by pumping at a low rate (approximately 0.1 to 0.5 liter/minute) and continually measuring water levels in the well. Note that site's hyrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Bottle Type (preservative)	Comments:
DAH	4	1L	great recharge
GRO/BTEX	9	HCl 40 ml	
DRO	6	HCl 250	

Signed: Sarah Christ Date: 10/24/13
Signed/reviewer: Date:

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APPENDIX B

Analytical Results

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Anchorage
2000 West International Airport Road Suite A10
Anchorage, AK 99502-1119
Tel: (907) 563-9200

TestAmerica Job ID: AWJ0065
Client Project/Site: 0220880
Client Project Description: Horizon Lines LTM
Revision: 1

For:
ERM Alaska, Inc.
825 W 8th Ave, ste 200
Anchorage, AK/USA 99501-4427

Attn: Kate Johnson

Johanna Dreher

Authorized for release by:
11/19/2013 2:38:09 PM

Johanna L Dreher, Client Services Manager
(907) 563-9200
johanna.dreher@testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Fuels

Qualifier	Qualifier Description
Q4	The hydrocarbons present are a complex mixture of diesel range and heavy oil range organics.
Q11	Detected hydrocarbons in the diesel range do not have a distinct diesel pattern and may be due to heavily weathered diesel.

GC Volatiles

Qualifier	Qualifier Description
C4	Calibration Verification recovery was below the method control limit for this analyte.
R2	The RPD exceeded the acceptance limit.
RL7	Sample required dilution due to high concentrations of target analyte.
Z1	Surrogate recovery was above acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Job ID: AWJ0065

Laboratory: TestAmerica Anchorage

Narrative

Revised Report issued 11/19/13
This report was revised to include 1-methylnaphthalene and 2-methylnaphthalene.

Receipt
Samples were received on 10/25/2013 at 09:54 AM; the samples arrived in good condition, properly preserved and, where required, on ice.

The temperature of the cooler at receipt was 2.6º C.

Except:
Limited GRO/BTEX volume provided for sample 13-HLA-MW-10-1006

Subcontracted
PAH SIM by 8270 samples were subcontracted to TestAmerica Portland from TestAmerica Anchorage.

Laboratory: TestAmerica Portland

Narrative

Receipt
The samples were received on 10/28/2013 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3º C.

GC/MS Semi VOA - Method 8270C SIM:
The detection limit for Phenanthrene has been raised equal to the reporting limit due to sample matrix effects.

The following samples were diluted due to the nature of the sample matrix: AWJ0065-04 (250-15087-1), AWJ0065-05 (250-15087-2). Elevated reporting limits (RLs) are provided.

No other analytical or quality issues were noted.

Organic Prep
No analytical or quality issues were noted.

Detection Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Client Sample ID: 13-HLA-HC-01-1002 — Lab Sample ID: AWJ0065-01

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	2.95	Q4	0.391		mg/l	1.00		AK 102	Total
Gasoline Range Organics	2260	RL7	500		ug/l	10.0		AK101/EPA 8021B	Total
Benzene	737	RL7	5.00		ug/l	10.0		AK101/EPA 8021B	Total
Ethylbenzene	89.3	RL7	5.00		ug/l	10.0		AK101/EPA 8021B	Total
Xylenes (total)	159	RL7	15.0		ug/l	10.0		AK101/EPA 8021B	Total

Client Sample ID: 13-HLA-HC-06-1001 — Lab Sample ID: AWJ0065-02

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	1.54	Q4	0.439		mg/l	1.00		AK 102	Total

Client Sample ID: 13-HLA-HC-03-1005 — Lab Sample ID: AWJ0065-03

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Diesel Range Organics	0.848		0.397		mg/l	1.00		AK 102	Total
Benzene	2.00		0.500		ug/l	1.00		AK101/EPA 8021B	Total

Client Sample ID: 13-HLA-MW-08-1003 — Lab Sample ID: AWJ0065-04

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	1.4		1.1	0.55	ug/L	10		8270C SIM	Total/NA
Fluorene	0.70	J	1.1	0.55	ug/L	10		8270C SIM	Total/NA
Naphthalene	210		5.5	2.7	ug/L	50		8270C SIM	Total/NA
2-Methylnaphthalene	75		5.5	2.7	ug/L	50		8270C SIM	Total/NA
1-Methylnaphthalene	47		5.5	2.7	ug/L	50		8270C SIM	Total/NA
Diesel Range Organics	17.7	Q11	0.397		mg/l	1.00		AK 102	Total
Gasoline Range Organics	24100	RL7	5000		ug/l	100		AK101/EPA 8021B	Total
Benzene	1380	RL7	50.0		ug/l	100		AK101/EPA 8021B	Total
Toluene	130	RL7	50.0		ug/l	100		AK101/EPA 8021B	Total
Ethylbenzene	1510	RL7	50.0		ug/l	100		AK101/EPA 8021B	Total
Xylenes (total)	11000	RL7	150		ug/l	100		AK101/EPA 8021B	Total

Client Sample ID: 13-HLA-MW-Z-1004 — Lab Sample ID: AWJ0065-05

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acenaphthene	1.0	J	1.1	0.56	ug/L	10		8270C SIM	Total/NA
Fluorene	0.68	J	1.1	0.56	ug/L	10		8270C SIM	Total/NA
Naphthalene	220		5.6	2.8	ug/L	50		8270C SIM	Total/NA
2-Methylnaphthalene	79		5.6	2.8	ug/L	50		8270C SIM	Total/NA
1-Methylnaphthalene	50		5.6	2.8	ug/L	50		8270C SIM	Total/NA
Diesel Range Organics	15.2	Q11	0.397		mg/l	1.00		AK 102	Total
Gasoline Range Organics	27400	RL7	5000		ug/l	100		AK101/EPA 8021B	Total

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Client Sample ID: 13-HLA-MW-Z-1004 (Continued) — Lab Sample ID: AWJ0065-05

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	1430	RL7	50.0		ug/l	100		AK101/EPA 8021B	Total
Toluene	138	RL7	50.0		ug/l	100		AK101/EPA 8021B	Total
Ethylbenzene	1630	RL7	50.0		ug/l	100		AK101/EPA 8021B	Total
Xylenes (total)	12000	RL7	150		ug/l	100		AK101/EPA 8021B	Total

Client Sample ID: 13-HLA-MW-10-1006 — Lab Sample ID: AWJ0065-06

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics	137		50.0		ug/l	1.00		AK101/EPA 8021B	Total
Benzene	5.03		0.500		ug/l	1.00		AK101/EPA 8021B	Total
Toluene	1.15		0.500		ug/l	1.00		AK101/EPA 8021B	Total
Ethylbenzene	8.57		0.500		ug/l	1.00		AK101/EPA 8021B	Total
Xylenes (total)	70.7		1.50		ug/l	1.00		AK101/EPA 8021B	Total

Client Sample ID: 13-HLA-TB-01-1007 — Lab Sample ID: AWJ0065-07

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: 13-HLA-HC-01-1002

Lab Sample ID: AWJ0065-01

Date Collected: 10/24/13 16:15

Matrix: Water

Date Received: 10/25/13 09:54

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	2.95	Q4	0.391		mg/l		11/04/13 08:20	11/04/13 16:46	1.00

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane	*89.5*		*50 - 150*	*11/04/13 08:20*	*11/04/13 16:46*	*1.00*

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	2260	RL7	500		ug/l		10/28/13 14:30	10/29/13 13:35	10.0
Benzene	737	RL7	5.00		ug/l		10/28/13 14:30	10/29/13 13:35	10.0
Toluene	ND	RL7	5.00		ug/l		10/28/13 14:30	10/29/13 13:35	10.0
Ethylbenzene	89.3	RL7	5.00		ug/l		10/28/13 14:30	10/29/13 13:35	10.0
Xylenes (total)	159	RL7	15.0		ug/l		10/28/13 14:30	10/29/13 13:35	10.0

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*123*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 13:35*	*10.0*
4-BFB (PID)	*117*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 13:35*	*10.0*
a,a,a-TFT (FID)	*86.3*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 13:35*	*10.0*
a,a,a-TFT (PID)	*84.2*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 13:35*	*10.0*

Client Sample ID: 13-HLA-HC-06-1001

Lab Sample ID: AWJ0065-02

Date Collected: 10/24/13 14:00

Matrix: Water

Date Received: 10/25/13 09:54

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	1.54	Q4	0.439		mg/l		11/04/13 08:20	11/04/13 16:46	1.00

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane	*108*		*50 - 150*	*11/04/13 08:20*	*11/04/13 16:46*	*1.00*

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	ND		50.0		ug/l		10/28/13 14:30	10/29/13 10:26	1.00
Benzene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 10:26	1.00
Toluene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 10:26	1.00
Ethylbenzene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 10:26	1.00
Xylenes (total)	ND		1.50		ug/l		10/28/13 14:30	10/29/13 10:26	1.00

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*87.9*		*50 - 150*	*10/28/13 14:30*	*10/29/13 10:26*	*1.00*
4-BFB (PID)	*85.0*		*50 - 150*	*10/28/13 14:30*	*10/29/13 10:26*	*1.00*
a,a,a-TFT (FID)	*71.3*		*50 - 150*	*10/28/13 14:30*	*10/29/13 10:26*	*1.00*
a,a,a-TFT (PID)	*71.3*		*50 - 150*	*10/28/13 14:30*	*10/29/13 10:26*	*1.00*

Client Sample ID: 13-HLA-HC-03-1005

Lab Sample ID: AWJ0065-03

Date Collected: 10/24/13 16:45

Matrix: Water

Date Received: 10/25/13 09:54

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	0.848		0.397		mg/l		11/04/13 08:20	11/04/13 17:18	1.00

Client Sample ID: 13-HLA-HC-03-1005

Lab Sample ID: AWJ0065-03

Date Collected: 10/24/13 16:45

Matrix: Water

Date Received: 10/25/13 09:54

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	*98.0*		*50 - 150*	*11/04/13 08:20*	*11/04/13 17:18*	*1.00*

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	ND		50.0		ug/l		10/28/13 14:30	10/29/13 12:14	1.00
Benzene	**2.00**		0.500		ug/l		10/28/13 14:30	10/29/13 12:14	1.00
Toluene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 12:14	1.00
Ethylbenzene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 12:14	1.00
Xylenes (total)	ND		1.50		ug/l		10/28/13 14:30	10/29/13 12:14	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	*81.0*		*50 - 150*	*10/28/13 14:30*	*10/29/13 12:14*	*1.00*
4-BFB (PID)	*79.8*		*50 - 150*	*10/28/13 14:30*	*10/29/13 12:14*	*1.00*
a,a,a-TFT (FID)	*68.6*		*50 - 150*	*10/28/13 14:30*	*10/29/13 12:14*	*1.00*
a,a,a-TFT (PID)	*68.7*		*50 - 150*	*10/28/13 14:30*	*10/29/13 12:14*	*1.00*

Client Sample ID: 13-HLA-MW-08-1003

Lab Sample ID: AWJ0065-04

Date Collected: 10/24/13 16:00

Matrix: Water

Date Received: 10/25/13 09:54

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**1.4**		1.1	0.55	ug/L		10/28/13 11:59	10/29/13 14:44	10
Acenaphthylene	ND		1.1	0.55	ug/L		10/28/13 11:59	10/29/13 14:44	10
Anthracene	ND		1.1	0.55	ug/L		10/28/13 11:59	10/29/13 14:44	10
Benzo[a]anthracene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Benzo[a]pyrene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Benzo[b]fluoranthene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Benzo[g,h,i]perylene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Benzo[k]fluoranthene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Chrysene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Dibenz(a,h)anthracene	ND		0.22	0.11	ug/L		10/28/13 11:59	10/29/13 13:46	1
Fluoranthene	ND		1.1	0.55	ug/L		10/28/13 11:59	10/29/13 14:44	10
Fluorene	**0.70**	**J**	1.1	0.55	ug/L		10/28/13 11:59	10/29/13 14:44	10
Indeno[1,2,3-cd]pyrene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
Naphthalene	**210**		5.5	2.7	ug/L		10/28/13 11:59	10/29/13 19:05	50
Phenanthrene	ND		1.1	1.1	ug/L		10/28/13 11:59	10/29/13 14:44	10
Pyrene	ND		0.11	0.055	ug/L		10/28/13 11:59	10/29/13 13:46	1
2-Methylnaphthalene	**75**		5.5	2.7	ug/L		10/28/13 11:59	11/13/13 15:50	50
1-Methylnaphthalene	**47**		5.5	2.7	ug/L		10/28/13 11:59	11/13/13 15:50	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Fluorene-d10 (Surr)	*88*		*25 - 125*	*10/28/13 11:59*	*10/29/13 14:44*	*10*
Pyrene-d10 (Surr)	*73*		*25 - 150*	*10/28/13 11:59*	*10/29/13 13:46*	*1*
p-Terphenyl-d14 (Surr)	*55*		*10 - 150*	*10/28/13 11:59*	*10/29/13 13:46*	*1*

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	**17.7**	**Q11**	0.397		mg/l		11/04/13 08:20	11/04/13 17:18	1.00

Client Sample ID: 13-HLA-MW-08-1003

Lab Sample ID: AWJ0065-04

Date Collected: 10/24/13 16:00

Matrix: Water

Date Received: 10/25/13 09:54

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	*80.0*		*50 - 150*	*11/04/13 08:20*	*11/04/13 17:18*	*1.00*

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	**24100**	**RL7**	5000		ug/l		10/28/13 14:30	10/29/13 14:02	100
Benzene	**1380**	**RL7**	50.0		ug/l		10/28/13 14:30	10/29/13 14:02	100
Toluene	**130**	**RL7**	50.0		ug/l		10/28/13 14:30	10/29/13 14:02	100
Ethylbenzene	**1510**	**RL7**	50.0		ug/l		10/28/13 14:30	10/29/13 14:02	100
Xylenes (total)	**11000**	**RL7**	150		ug/l		10/28/13 14:30	10/29/13 14:02	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	*80.2*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 14:02*	*100*
4-BFB (PID)	*78.2*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 14:02*	*100*
a,a,a-TFT (FID)	*58.5*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 14:02*	*100*
a,a,a-TFT (PID)	*77.4*	*RL7*	*50 - 150*	*10/28/13 14:30*	*10/29/13 14:02*	*100*

Client Sample ID: 13-HLA-MW-Z-1004

Lab Sample ID: AWJ0065-05

Date Collected: 10/24/13 16:00

Matrix: Water

Date Received: 10/25/13 09:54

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**1.0**	**J**	1.1	0.56	ug/L		10/28/13 11:59	10/29/13 18:35	10
Acenaphthylene	ND		1.1	0.56	ug/L		10/28/13 11:59	10/29/13 18:35	10
Anthracene	ND		1.1	0.56	ug/L		10/28/13 11:59	10/29/13 18:35	10
Benzo[a]anthracene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Benzo[a]pyrene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Benzo[b]fluoranthene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Benzo[g,h,i]perylene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Benzo[k]fluoranthene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Chrysene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Dibenz(a,h)anthracene	ND		0.22	0.11	ug/L		10/28/13 11:59	10/29/13 14:15	1
Fluoranthene	ND		1.1	0.56	ug/L		10/28/13 11:59	10/29/13 18:35	10
Fluorene	**0.68**	**J**	1.1	0.56	ug/L		10/28/13 11:59	10/29/13 18:35	10
Indeno[1,2,3-cd]pyrene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
Naphthalene	**220**		5.6	2.8	ug/L		10/28/13 11:59	10/29/13 19:33	50
Phenanthrene	ND		1.1	0.56	ug/L		10/28/13 11:59	10/29/13 18:35	10
Pyrene	ND		0.11	0.056	ug/L		10/28/13 11:59	10/29/13 14:15	1
2-Methylnaphthalene	**79**		5.6	2.8	ug/L		10/28/13 11:59	11/13/13 16:18	50
1-Methylnaphthalene	**50**		5.6	2.8	ug/L		10/28/13 11:59	11/13/13 16:18	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Fluorene-d10 (Surr)	*82*		*25 - 125*	*10/28/13 11:59*	*10/29/13 18:35*	*10*
Pyrene-d10 (Surr)	*74*		*25 - 150*	*10/28/13 11:59*	*10/29/13 14:15*	*1*
p-Terphenyl-d14 (Surr)	*51*		*10 - 150*	*10/28/13 11:59*	*10/29/13 14:15*	*1*

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	**15.2**	**Q11**	0.397		mg/l		11/04/13 08:20	11/04/13 17:50	1.00

Client Sample ID: 13-HLA-MW-Z-1004

Lab Sample ID: AWJ0065-05

Date Collected: 10/24/13 16:00

Matrix: Water

Date Received: 10/25/13 09:54

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	96.8		50 - 150	11/04/13 08:20	11/04/13 17:50	1.00

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	27400	RL7	5000		ug/l		10/28/13 14:30	10/29/13 12:41	100
Benzene	1430	RL7	50.0		ug/l		10/28/13 14:30	10/29/13 12:41	100
Toluene	138	RL7	50.0		ug/l		10/28/13 14:30	10/29/13 12:41	100
Ethylbenzene	1630	RL7	50.0		ug/l		10/28/13 14:30	10/29/13 12:41	100
Xylenes (total)	12000	RL7	150		ug/l		10/28/13 14:30	10/29/13 12:41	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	96.5	RL7	50 - 150	10/28/13 14:30	10/29/13 12:41	100
4-BFB (PID)	92.9	RL7	50 - 150	10/28/13 14:30	10/29/13 12:41	100
a,a,a-TFT (FID)	84.2	RL7	50 - 150	10/28/13 14:30	10/29/13 12:41	100
a,a,a-TFT (PID)	82.1	RL7	50 - 150	10/28/13 14:30	10/29/13 12:41	100

Client Sample ID: 13-HLA-MW-10-1006

Lab Sample ID: AWJ0065-06

Date Collected: 10/24/13 17:00

Matrix: Water

Date Received: 10/25/13 09:54

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	137		50.0		ug/l		10/28/13 14:30	10/29/13 13:08	1.00
Benzene	5.03		0.500		ug/l		10/28/13 14:30	10/29/13 13:08	1.00
Toluene	1.15		0.500		ug/l		10/28/13 14:30	10/29/13 13:08	1.00
Ethylbenzene	8.57		0.500		ug/l		10/28/13 14:30	10/29/13 13:08	1.00
Xylenes (total)	70.7		1.50		ug/l		10/28/13 14:30	10/29/13 13:08	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	160	Z1	50 - 150	10/28/13 14:30	10/29/13 13:08	1.00
4-BFB (PID)	148		50 - 150	10/28/13 14:30	10/29/13 13:08	1.00
a,a,a-TFT (FID)	115		50 - 150	10/28/13 14:30	10/29/13 13:08	1.00
a,a,a-TFT (PID)	110		50 - 150	10/28/13 14:30	10/29/13 13:08	1.00

Client Sample ID: 13-HLA-TB-01-1007

Lab Sample ID: AWJ0065-07

Date Collected: 10/24/13 17:30

Matrix: Water

Date Received: 10/25/13 09:54

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101 - RE1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	ND		50.0		ug/l		10/30/13 18:58	10/31/13 11:30	1.00
Benzene	ND		0.500		ug/l		10/30/13 18:58	10/31/13 11:30	1.00
Toluene	ND		0.500		ug/l		10/30/13 18:58	10/31/13 11:30	1.00
Ethylbenzene	ND		0.500		ug/l		10/30/13 18:58	10/31/13 11:30	1.00
Xylenes (total)	ND		1.50		ug/l		10/30/13 18:58	10/31/13 11:30	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	120		50 - 150	10/30/13 18:58	10/31/13 11:30	1.00
4-BFB (PID)	118		50 - 150	10/30/13 18:58	10/31/13 11:30	1.00
a,a,a-TFT (FID)	121		50 - 150	10/30/13 18:58	10/31/13 11:30	1.00
a,a,a-TFT (PID)	115		50 - 150	10/30/13 18:58	10/31/13 11:30	1.00

Surrogate Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		FD10	PD10	TPH
Lab Sample ID	Client Sample ID	(25-125)	(25-150)	(10-150)
AWJ0065-04	13-HLA-MW-08-1003		73	55
AWJ0065-04	13-HLA-MW-08-1003	88		
AWJ0065-05	13-HLA-MW-Z-1004	82		
AWJ0065-05	13-HLA-MW-Z-1004		74	51
LCS 250-21503/2-A	Lab Control Sample	106	107	111
LCSD 250-21503/3-A	Lab Control Sample Dup	95	98	101
MB 250-21503/1-A	Method Blank	100	106	109

Surrogate Legend

FD10 = Fluorene-d10 (Surr)

PD10 = Pyrene-d10 (Surr)

TPH = p-Terphenyl-d14 (Surr)

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)
		1COD
Lab Sample ID	Client Sample ID	(50-150)
13K0008-BLK1	Method Blank	100
13K0008-DUP1	13-HLA-HC-06-1001	109
13K0008-MS1	13-HLA-HC-06-1001	116
13K0008-MSD1	13-HLA-HC-06-1001	109
AWJ0065-01	13-HLA-HC-01-1002	89.5
AWJ0065-02	13-HLA-HC-06-1001	108
AWJ0065-03	13-HLA-HC-03-1005	98.0
AWJ0065-04	13-HLA-MW-08-1003	80.0
AWJ0065-05	13-HLA-MW-Z-1004	96.8

Surrogate Legend

1COD = 1-Chlorooctadecane

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)
		1COD
Lab Sample ID	Client Sample ID	(60-120)
13K0008-BS1	Lab Control Sample	94.9
13K0008-BSD1	Lab Control Sample Dup	92.4

Surrogate Legend

1COD = 1-Chlorooctadecane

Surrogate Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)							
		4-BFB (FID)	4-BFB (PID)	a,a-TFT (FI	a,a-TFT (PI	a,a-TFT (FI	a,a-TFT (FI	a,a-TFT (PI	a,a-TFT (PI
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(60-120)	(50-150)	(60-135)
13J0114-BLK1	Method Blank	73.0	69.3	76.4	75.0	76.4		75.0	
13J0114-DUP1	13-HLA-HC-06-1001	75.1	73.0	67.1	66.2	67.1		66.2	
13J0114-MS1	13-HLA-HC-06-1001		92.1		76.5			76.5	
13J0114-MSD1	13-HLA-HC-06-1001		100		77.1			77.1	
13J0127-BLK1	Method Blank	135	130	114	109	114		109	
13J0127-DUP1	Duplicate		112		88.6			88.6	
AWJ0065-01	13-HLA-HC-01-1002	123 RL7	117 RL7	86.3 RL7	84.2 RL7	86.3 RL7		84.2 RL7	
AWJ0065-02	13-HLA-HC-06-1001	87.9	85.0	71.3	71.3	71.3		71.3	
AWJ0065-03	13-HLA-HC-03-1005	81.0	79.8	68.6	68.7	68.6		68.7	
AWJ0065-04	13-HLA-MW-08-1003	80.2 RL7	78.2 RL7	58.5 RL7	77.4 RL7	58.5 RL7		77.4 RL7	
AWJ0065-05	13-HLA-MW-Z-1004	96.5 RL7	92.9 RL7	84.2 RL7	82.1 RL7	84.2 RL7		82.1 RL7	
AWJ0065-06	13-HLA-MW-10-1006	160 Z1	148	115	110	115		110	
AWJ0065-07 - RE1	13-HLA-TB-01-1007	120	118	121	115	121		115	

Surrogate Legend

4-BFB (FID) = 4-BFB (FID)
4-BFB (PID) = 4-BFB (PID)
a,a,a-TFT (FID) = a,a,a-TFT (FID)
a,a,a-TFT (PID) = a,a,a-TFT (PID)

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)							
		4-BFB (PID)	a,a-TFT (PI						
Lab Sample ID	Client Sample ID	(58.2-129)	(60-135)						
13J0114-BS1	Lab Control Sample	109	102						
13J0114-BSD1	Lab Control Sample Dup	93.6	80.5						
13J0127-BS1	Lab Control Sample	114	78.9						
13J0127-BSD1	Lab Control Sample Dup	98.2	84.5						

Surrogate Legend

4-BFB (PID) = 4-BFB (PID)
a,a,a-TFT (PID) = a,a,a-TFT (PID)

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Matrix: Water **Prep Type: Total**

		Percent Surrogate Recovery (Acceptance Limits)							
		4-BFB (FID)	a,a-TFT (FI						
Lab Sample ID	Client Sample ID	(60-120)	(60-120)						
13J0114-BS2	Lab Control Sample	118	96.8						
13J0114-BSD2	Lab Control Sample Dup	95.0	92.5						
13J0127-BS2	Lab Control Sample	88.7	102						
13J0127-BSD2	Lab Control Sample Dup	93.2	106						

Surrogate Legend

4-BFB (FID) = 4-BFB (FID)
a,a,a-TFT (FID) = a,a,a-TFT (FID)

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 250-21503/1-A
Matrix: Water
Analysis Batch: 21607

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 21503

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Acenaphthylene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Anthracene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Benzo[a]anthracene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Benzo[a]pyrene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Benzo[b]fluoranthene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Benzo[g,h,i]perylene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Benzo[k]fluoranthene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Chrysene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Dibenz(a,h)anthracene	ND		0.20	0.10	ug/L		10/28/13 07:55	10/29/13 20:02	1
Fluoranthene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Fluorene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Indeno[1,2,3-cd]pyrene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Naphthalene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Phenanthrene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1
Pyrene	ND		0.10	0.050	ug/L		10/28/13 07:55	10/29/13 20:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Fluorene-d10 (Surr)	*100*		*25 - 125*	*10/28/13 07:55*	*10/29/13 20:02*	*1*
Pyrene-d10 (Surr)	*106*		*25 - 150*	*10/28/13 07:55*	*10/29/13 20:02*	*1*
p-Terphenyl-d14 (Surr)	*109*		*10 - 150*	*10/28/13 07:55*	*10/29/13 20:02*	*1*

Lab Sample ID: MB 250-21503/1-A
Matrix: Water
Analysis Batch: 22059

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 21503

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene	ND		0.10	0.050	ug/L		10/28/13 07:55	11/13/13 15:21	1
1-Methylnaphthalene	ND		0.10	0.050	ug/L		10/28/13 07:55	11/13/13 15:21	1

Lab Sample ID: LCS 250-21503/2-A
Matrix: Water
Analysis Batch: 21607

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21503

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	2.50	2.57		ug/L		103	25 - 135
Acenaphthylene	2.50	2.98		ug/L		119	30 - 120
Anthracene	2.50	2.55		ug/L		102	30 - 120
Benzo[a]anthracene	2.50	2.81		ug/L		112	35 - 130
Benzo[a]pyrene	2.50	2.55		ug/L		102	40 - 135
Benzo[b]fluoranthene	2.50	2.86		ug/L		114	35 - 130
Benzo[g,h,i]perylene	2.50	2.56		ug/L		103	30 - 125
Benzo[k]fluoranthene	2.50	2.68		ug/L		107	30 - 145
Chrysene	2.50	2.72		ug/L		109	30 - 135
Dibenz(a,h)anthracene	2.50	2.82		ug/L		113	30 - 140
Fluoranthene	2.50	2.85		ug/L		114	30 - 125
Fluorene	2.50	2.85		ug/L		114	30 - 125
Indeno[1,2,3-cd]pyrene	2.50	2.75		ug/L		110	30 - 135

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 250-21503/2-A
Matrix: Water
Analysis Batch: 21607

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21503

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	2.50	2.88		ug/L		115	30 - 115
Phenanthrene	2.50	2.68		ug/L		107	35 - 125
Pyrene	2.50	2.76		ug/L		111	35 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Fluorene-d10 (Surr)	*106*		*25 - 125*
Pyrene-d10 (Surr)	*107*		*25 - 150*
p-Terphenyl-d14 (Surr)	*111*		*10 - 150*

Lab Sample ID: LCS 250-21503/2-A
Matrix: Water
Analysis Batch: 22059

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 21503

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Methylnaphthalene	2.50	2.55		ug/L		102	30 - 115
1-Methylnaphthalene	2.50	2.35		ug/L		94	30 - 115

Lab Sample ID: LCSD 250-21503/3-A
Matrix: Water
Analysis Batch: 21607

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 21503

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	2.50	2.36		ug/L		94	25 - 135	9	35
Acenaphthylene	2.50	2.40		ug/L		96	30 - 120	22	35
Anthracene	2.50	2.41		ug/L		96	30 - 120	6	35
Benzo[a]anthracene	2.50	2.62		ug/L		105	35 - 130	7	35
Benzo[a]pyrene	2.50	2.48		ug/L		99	40 - 135	3	35
Benzo[b]fluoranthene	2.50	2.63		ug/L		105	35 - 130	9	35
Benzo[g,h,i]perylene	2.50	2.54		ug/L		102	30 - 125	1	35
Benzo[k]fluoranthene	2.50	2.55		ug/L		102	30 - 145	5	35
Chrysene	2.50	2.54		ug/L		101	30 - 135	7	35
Dibenz(a,h)anthracene	2.50	2.68		ug/L		107	30 - 140	5	35
Fluoranthene	2.50	2.68		ug/L		107	30 - 125	6	35
Fluorene	2.50	2.61		ug/L		104	30 - 125	9	35
Indeno[1,2,3-cd]pyrene	2.50	2.64		ug/L		105	30 - 135	4	35
Naphthalene	2.50	2.65		ug/L		106	30 - 115	8	35
Phenanthrene	2.50	2.54		ug/L		102	35 - 125	5	35
Pyrene	2.50	2.57		ug/L		103	35 - 135	7	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Fluorene-d10 (Surr)	*95*		*25 - 125*
Pyrene-d10 (Surr)	*98*		*25 - 150*
p-Terphenyl-d14 (Surr)	*101*		*10 - 150*

Method: 8270C SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCSD 250-21503/3-A
Matrix: Water
Analysis Batch: 22059

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 21503

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2-Methylnaphthalene			2.50	2.28		ug/L		91	30 - 115	11	35
1-Methylnaphthalene			2.50	2.26		ug/L		90	30 - 115	4	35

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102

Lab Sample ID: 13K0008-BLK1
Matrix: Water
Analysis Batch: W000627

Client Sample ID: Method Blank
Prep Type: Total
Prep Batch: 13K0008_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics	ND		0.500		mg/l		11/04/13 08:20	11/04/13 15:09	1.00

Surrogate	*Blank %Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1-Chlorooctadecane	*100*		*50 - 150*	*11/04/13 08:20*	*11/04/13 15:09*	*1.00*

Lab Sample ID: 13K0008-BS1
Matrix: Water
Analysis Batch: W000627

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 13K0008_P

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics			10.3	9.87		mg/l		95.9	75 - 125

Surrogate		*LCS %Recovery*	*LCS Qualifier*	*Limits*
1-Chlorooctadecane		*94.9*		*60 - 120*

Lab Sample ID: 13K0008-BSD1
Matrix: Water
Analysis Batch: W000627

Client Sample ID: Lab Control Sample Dup
Prep Type: Total
Prep Batch: 13K0008_P

Analyte			Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics			10.3	9.79		mg/l		95.0	75 - 125	0.846	20

Surrogate		*LCS Dup %Recovery*	*LCS Dup Qualifier*	*Limits*
1-Chlorooctadecane		*92.4*		*60 - 120*

Lab Sample ID: 13K0008-MS1
Matrix: Water
Analysis Batch: W000628

Client Sample ID: 13-HLA-HC-06-1001
Prep Type: Total
Prep Batch: 13K0008_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics	1.54	Q4	8.24	9.67		mg/l		98.7	75 - 125

Surrogate	*Matrix Spike %Recovery*	*Matrix Spike Qualifier*	*Limits*
1-Chlorooctadecane	*116*		*50 - 150*

Method: AK 102 - Diesel Range Organics (C10-C25) per AK102 (Continued)

Lab Sample ID: 13K0008-MSD1 — **Client Sample ID: 13-HLA-HC-06-1001**
Matrix: Water — **Prep Type: Total**
Analysis Batch: W000628 — **Prep Batch: 13K0008_P**

Analyte	Sample Result	Sample Qualifier	Spike Added	trix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics	1.54	Q4	8.44	9.21		mg/l		90.9	75 - 125	4.85	25

Surrogate	*Matrix Spike Dup %Recovery*	*Matrix Spike Dup Qualifier*	*Limits*
1-Chlorooctadecane	*109*		*50 - 150*

Lab Sample ID: 13K0008-DUP1 — **Client Sample ID: 13-HLA-HC-06-1001**
Matrix: Water — **Prep Type: Total**
Analysis Batch: W000628 — **Prep Batch: 13K0008_P**

Analyte	Sample Result	Sample Qualifier		Duplicate Result	Duplicate Qualifier	Unit	D			RPD	RPD Limit
Diesel Range Organics	1.54	Q4		1.52		mg/l				1.23	20

Surrogate	*Duplicate %Recovery*	*Duplicate Qualifier*	*Limits*
1-Chlorooctadecane	*109*		*50 - 150*

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101

Lab Sample ID: 13J0114-BLK1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total**
Analysis Batch: W000611 — **Prep Batch: 13J0114_P**

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	ND		50.0		ug/l		10/28/13 14:30	10/29/13 09:59	1.00
Benzene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 09:59	1.00
Toluene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 09:59	1.00
Ethylbenzene	ND		0.500		ug/l		10/28/13 14:30	10/29/13 09:59	1.00
Xylenes (total)	ND		1.50		ug/l		10/28/13 14:30	10/29/13 09:59	1.00

Surrogate	*Blank %Recovery*	*Blank Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-BFB (FID)	*73.0*		*50 - 150*	*10/28/13 14:30*	*10/29/13 09:59*	*1.00*
4-BFB (PID)	*69.3*		*50 - 150*	*10/28/13 14:30*	*10/29/13 09:59*	*1.00*
a,a,a-TFT (FID)	*76.4*		*50 - 150*	*10/28/13 14:30*	*10/29/13 09:59*	*1.00*
a,a,a-TFT (PID)	*75.0*		*50 - 150*	*10/28/13 14:30*	*10/29/13 09:59*	*1.00*

Lab Sample ID: 13J0114-BS1 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total**
Analysis Batch: W000611 — **Prep Batch: 13J0114_P**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			20.0	18.5		ug/l		92.7	57.9 - 151		
Toluene			20.0	18.6		ug/l		92.8	54.8 - 154		
Ethylbenzene			20.0	19.2		ug/l		96.0	67.2 - 132		
Xylenes (total)			60.0	58.1		ug/l		96.8	66.4 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-BFB (PID)	*109*		*58.2 - 129*

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101 (Continued)

Lab Sample ID: 13J0114-BS1
Matrix: Water
Analysis Batch: W000611

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 13J0114_P

Surrogate	LCS %Recovery	LCS Qualifier	Limits
a,a,a-TFT (PID)	*102*		*60 - 135*

Lab Sample ID: 13J0114-BS2
Matrix: Water
Analysis Batch: W000611

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 13J0114_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics	500	478		ug/l		95.7	60 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-BFB (FID)	*118*		*60 - 120*
a,a,a-TFT (FID)	*96.8*		*60 - 120*

Lab Sample ID: 13J0114-BSD1
Matrix: Water
Analysis Batch: W000611

Client Sample ID: Lab Control Sample Dup
Prep Type: Total
Prep Batch: 13J0114_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	20.0	18.6		ug/l		92.9	57.9 - 151	0.253	20
Toluene	20.0	18.1		ug/l		90.4	54.8 - 154	2.61	20
Ethylbenzene	20.0	18.2		ug/l		90.8	67.2 - 132	5.50	20
Xylenes (total)	60.0	55.2		ug/l		91.9	66.4 - 130	5.20	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
4-BFB (PID)	*93.6*		*58.2 - 129*
a,a,a-TFT (PID)	*80.5*		*60 - 135*

Lab Sample ID: 13J0114-BSD2
Matrix: Water
Analysis Batch: W000611

Client Sample ID: Lab Control Sample Dup
Prep Type: Total
Prep Batch: 13J0114_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics	500	533		ug/l		107	60 - 120	10.8	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
4-BFB (FID)	*95.0*		*60 - 120*
a,a,a-TFT (FID)	*92.5*		*60 - 120*

Lab Sample ID: 13J0114-MS1
Matrix: Water
Analysis Batch: W000611

Client Sample ID: 13-HLA-HC-06-1001
Prep Type: Total
Prep Batch: 13J0114_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	ND		20.0	17.8		ug/l		89.1	60 - 140
Toluene	ND		20.0	17.7		ug/l		88.5	60 - 140
Ethylbenzene	ND		20.0	17.7		ug/l		88.3	60 - 140
Xylenes (total)	0.410		60.0	53.9		ug/l		89.1	60 - 140

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101 (Continued)

Lab Sample ID: 13J0114-MS1
Matrix: Water
Analysis Batch: W000611

Client Sample ID: 13-HLA-HC-06-1001
Prep Type: Total
Prep Batch: 13J0114_P

Surrogate	Matrix Spike %Recovery	Matrix Spike Qualifier	Limits
4-BFB (PID)	92.1		50 - 150
a,a,a-TFT (PID)	76.5		50 - 150

Lab Sample ID: 13J0114-MSD1
Matrix: Water
Analysis Batch: W000611

Client Sample ID: 13-HLA-HC-06-1001
Prep Type: Total
Prep Batch: 13J0114_P

Analyte	Sample Result	Sample Qualifier	Spike Added	trix Spike Dup Result	Matrix Spike Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	ND		20.0	18.2		ug/l		90.8	60 - 140	1.87	25
Toluene	ND		20.0	18.1		ug/l		90.7	60 - 140	2.37	25
Ethylbenzene	ND		20.0	18.4		ug/l		91.8	60 - 140	3.88	25
Xylenes (total)	0.410		60.0	56.5		ug/l		93.5	60 - 140	4.80	25

Surrogate	Matrix Spike Dup %Recovery	Matrix Spike Dup Qualifier	Limits
4-BFB (PID)	100		50 - 150
a,a,a-TFT (PID)	77.1		50 - 150

Lab Sample ID: 13J0114-DUP1
Matrix: Water
Analysis Batch: W000611

Client Sample ID: 13-HLA-HC-06-1001
Prep Type: Total
Prep Batch: 13J0114_P

Analyte	Sample Result	Sample Qualifier		Duplicate Result	Duplicate Qualifier	Unit	D			RPD	RPD Limit
Gasoline Range Organics	ND			ND		ug/l					20
Benzene	ND			ND		ug/l					20
Toluene	ND			ND		ug/l					20
Ethylbenzene	ND			ND		ug/l					20
Xylenes (total)	0.410			ND		ug/l					20

Surrogate	Duplicate %Recovery	Duplicate Qualifier	Limits
4-BFB (FID)	75.1		50 - 150
4-BFB (PID)	73.0		50 - 150
a,a,a-TFT (FID)	67.1		50 - 150
a,a,a-TFT (PID)	66.2		50 - 150

Lab Sample ID: 13J0127-BLK1
Matrix: Water
Analysis Batch: W000618

Client Sample ID: Method Blank
Prep Type: Total
Prep Batch: 13J0127_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics	ND		50.0		ug/l		10/30/13 18:58	10/31/13 11:57	1.00
Benzene	ND		0.500		ug/l		10/30/13 18:58	10/31/13 11:57	1.00
Toluene	ND		0.500		ug/l		10/30/13 18:58	10/31/13 11:57	1.00
Ethylbenzene	ND		0.500		ug/l		10/30/13 18:58	10/31/13 11:57	1.00
Xylenes (total)	ND		1.50		ug/l		10/30/13 18:58	10/31/13 11:57	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (FID)	135		50 - 150	10/30/13 18:58	10/31/13 11:57	1.00

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101 (Continued)

Lab Sample ID: 13J0127-BLK1
Matrix: Water
Analysis Batch: W000618

Client Sample ID: Method Blank
Prep Type: Total
Prep Batch: 13J0127_P

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-BFB (PID)	130		50 - 150	10/30/13 18:58	10/31/13 11:57	1.00
a,a,a-TFT (FID)	114		50 - 150	10/30/13 18:58	10/31/13 11:57	1.00
a,a,a-TFT (PID)	109		50 - 150	10/30/13 18:58	10/31/13 11:57	1.00

Lab Sample ID: 13J0127-BS1
Matrix: Water
Analysis Batch: W000618

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 13J0127_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	18.2		ug/l		90.9	57.9 - 151
Toluene	20.0	18.2		ug/l		91.2	54.8 - 154
Ethylbenzene	20.0	19.1		ug/l		95.4	67.2 - 132
Xylenes (total)	60.0	60.9		ug/l		102	66.4 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-BFB (PID)	114		58.2 - 129
a,a,a-TFT (PID)	78.9		60 - 135

Lab Sample ID: 13J0127-BS2
Matrix: Water
Analysis Batch: W000618

Client Sample ID: Lab Control Sample
Prep Type: Total
Prep Batch: 13J0127_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics	500	578		ug/l		116	60 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-BFB (FID)	88.7		60 - 120
a,a,a-TFT (FID)	102		60 - 120

Lab Sample ID: 13J0127-BSD1
Matrix: Water
Analysis Batch: W000618

Client Sample ID: Lab Control Sample Dup
Prep Type: Total
Prep Batch: 13J0127_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	20.0	18.8		ug/l		94.0	57.9 - 151	3.31	20
Toluene	20.0	19.1		ug/l		95.6	54.8 - 154	4.79	20
Ethylbenzene	20.0	20.1		ug/l		101	67.2 - 132	5.29	20
Xylenes (total)	60.0	61.6		ug/l		103	66.4 - 130	0.996	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
4-BFB (PID)	98.2		58.2 - 129
a,a,a-TFT (PID)	84.5		60 - 135

Method: AK101/EPA 8021B - Gasoline Range Organics (C6-C10) and BTEX per AK101 (Continued)

Lab Sample ID: 13J0127-BSD2 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total**
Analysis Batch: W000618 — **Prep Batch: 13J0127_P**

Analyte			Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics			500	562		ug/l		112	60 - 120	2.77	20

Surrogate	*LCS Dup %Recovery*	*LCS Dup Qualifier*	*Limits*
4-BFB (FID)	*93.2*		*60 - 120*
a,a,a-TFT (FID)	*106*		*60 - 120*

Lab Sample ID: 13J0127-DUP1 — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total**
Analysis Batch: W000618 — **Prep Batch: 13J0127_P**

Analyte	Sample Result	Sample Qualifier		Duplicate Result	Duplicate Qualifier	Unit	D			RPD	RPD Limit
Gasoline Range Organics	244			1780	R2	ug/l				152	20
Benzene	7.66			9.37	R2 C4	ug/l				20.1	20
Toluene	96.8			160	R2 C4	ug/l				49.3	20
Ethylbenzene	29.9			81.8	R2 C4	ug/l				92.9	20
Xylenes (total)	136			447	R2 C4	ug/l				107	20

Surrogate	*Duplicate %Recovery*	*Duplicate Qualifier*	*Limits*
4-BFB (PID)	*112*		*50 - 150*
a,a,a-TFT (PID)	*88.6*		*50 - 150*

GC/MS Semi VOA

Prep Batch: 21503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AWJ0065-04	13-HLA-MW-08-1003	Total/NA	Water	3520C	
AWJ0065-05	13-HLA-MW-Z-1004	Total/NA	Water	3520C	
LCS 250-21503/2-A	Lab Control Sample	Total/NA	Water	3520C	
LCSD 250-21503/3-A	Lab Control Sample Dup	Total/NA	Water	3520C	
MB 250-21503/1-A	Method Blank	Total/NA	Water	3520C	

Analysis Batch: 21607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AWJ0065-04	13-HLA-MW-08-1003	Total/NA	Water	8270C SIM	21503
AWJ0065-04	13-HLA-MW-08-1003	Total/NA	Water	8270C SIM	21503
AWJ0065-04	13-HLA-MW-08-1003	Total/NA	Water	8270C SIM	21503
AWJ0065-05	13-HLA-MW-Z-1004	Total/NA	Water	8270C SIM	21503
AWJ0065-05	13-HLA-MW-Z-1004	Total/NA	Water	8270C SIM	21503
AWJ0065-05	13-HLA-MW-Z-1004	Total/NA	Water	8270C SIM	21503
LCS 250-21503/2-A	Lab Control Sample	Total/NA	Water	8270C SIM	21503
LCSD 250-21503/3-A	Lab Control Sample Dup	Total/NA	Water	8270C SIM	21503
MB 250-21503/1-A	Method Blank	Total/NA	Water	8270C SIM	21503

Analysis Batch: 22059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
AWJ0065-04	13-HLA-MW-08-1003	Total/NA	Water	8270C SIM	21503
AWJ0065-05	13-HLA-MW-Z-1004	Total/NA	Water	8270C SIM	21503
LCS 250-21503/2-A	Lab Control Sample	Total/NA	Water	8270C SIM	21503
LCSD 250-21503/3-A	Lab Control Sample Dup	Total/NA	Water	8270C SIM	21503
MB 250-21503/1-A	Method Blank	Total/NA	Water	8270C SIM	21503

Fuels

Analysis Batch: W000627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13K0008-BLK1	Method Blank	Total	Water	AK 102	13K0008_P
13K0008-BS1	Lab Control Sample	Total	Water	AK 102	13K0008_P
13K0008-BSD1	Lab Control Sample Dup	Total	Water	AK 102	13K0008_P
AWJ0065-01	13-HLA-HC-01-1002	Total	Water	AK 102	13K0008_P
AWJ0065-03	13-HLA-HC-03-1005	Total	Water	AK 102	13K0008_P
AWJ0065-05	13-HLA-MW-Z-1004	Total	Water	AK 102	13K0008_P

Analysis Batch: W000628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13K0008-DUP1	13-HLA-HC-06-1001	Total	Water	AK 102	13K0008_P
13K0008-MS1	13-HLA-HC-06-1001	Total	Water	AK 102	13K0008_P
13K0008-MSD1	13-HLA-HC-06-1001	Total	Water	AK 102	13K0008_P
AWJ0065-02	13-HLA-HC-06-1001	Total	Water	AK 102	13K0008_P
AWJ0065-04	13-HLA-MW-08-1003	Total	Water	AK 102	13K0008_P

Prep Batch: 13K0008_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13K0008-BLK1	Method Blank	Total	Water	EPA 3510	
13K0008-BS1	Lab Control Sample	Total	Water	EPA 3510	
13K0008-BSD1	Lab Control Sample Dup	Total	Water	EPA 3510	

Fuels (Continued)

Prep Batch: 13K0008_P (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13K0008-DUP1	13-HLA-HC-06-1001	Total	Water	EPA 3510	
13K0008-MS1	13-HLA-HC-06-1001	Total	Water	EPA 3510	
13K0008-MSD1	13-HLA-HC-06-1001	Total	Water	EPA 3510	
AWJ0065-01	13-HLA-HC-01-1002	Total	Water	EPA 3510	
AWJ0065-02	13-HLA-HC-06-1001	Total	Water	EPA 3510	
AWJ0065-03	13-HLA-HC-03-1005	Total	Water	EPA 3510	
AWJ0065-04	13-HLA-MW-08-1003	Total	Water	EPA 3510	
AWJ0065-05	13-HLA-MW-Z-1004	Total	Water	EPA 3510	

GC Volatiles

Analysis Batch: W000611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13J0114-BLK1	Method Blank	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-BS1	Lab Control Sample	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-BS2	Lab Control Sample	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-BSD1	Lab Control Sample Dup	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-BSD2	Lab Control Sample Dup	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-DUP1	13-HLA-HC-06-1001	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-MS1	13-HLA-HC-06-1001	Total	Water	AK101/EPA 8021B	13J0114_P
13J0114-MSD1	13-HLA-HC-06-1001	Total	Water	AK101/EPA 8021B	13J0114_P
AWJ0065-01	13-HLA-HC-01-1002	Total	Water	AK101/EPA 8021B	13J0114_P
AWJ0065-02	13-HLA-HC-06-1001	Total	Water	AK101/EPA 8021B	13J0114_P
AWJ0065-03	13-HLA-HC-03-1005	Total	Water	AK101/EPA 8021B	13J0114_P
AWJ0065-04	13-HLA-MW-08-1003	Total	Water	AK101/EPA 8021B	13J0114_P
AWJ0065-05	13-HLA-MW-Z-1004	Total	Water	AK101/EPA 8021B	13J0114_P
AWJ0065-06	13-HLA-MW-10-1006	Total	Water	AK101/EPA 8021B	13J0114_P

Analysis Batch: W000618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13J0127-BLK1	Method Blank	Total	Water	AK101/EPA 8021B	13J0127_P
13J0127-BS1	Lab Control Sample	Total	Water	AK101/EPA 8021B	13J0127_P
13J0127-BS2	Lab Control Sample	Total	Water	AK101/EPA 8021B	13J0127_P
13J0127-BSD1	Lab Control Sample Dup	Total	Water	AK101/EPA 8021B	13J0127_P
13J0127-BSD2	Lab Control Sample Dup	Total	Water	AK101/EPA 8021B	13J0127_P

GC Volatiles (Continued)

Analysis Batch: W000618 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13J0127-DUP1	Duplicate	Total	Water	AK101/EPA 8021B	13J0127_P
AWJ0065-07 - RE1	13-HLA-TB-01-1007	Total	Water	AK101/EPA 8021B	13J0127_P

Prep Batch: 13J0114_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13J0114-BLK1	Method Blank	Total	Water	EPA 5030B	
13J0114-BS1	Lab Control Sample	Total	Water	EPA 5030B	
13J0114-BS2	Lab Control Sample	Total	Water	EPA 5030B	
13J0114-BSD1	Lab Control Sample Dup	Total	Water	EPA 5030B	
13J0114-BSD2	Lab Control Sample Dup	Total	Water	EPA 5030B	
13J0114-DUP1	13-HLA-HC-06-1001	Total	Water	EPA 5030B	
13J0114-MS1	13-HLA-HC-06-1001	Total	Water	EPA 5030B	
13J0114-MSD1	13-HLA-HC-06-1001	Total	Water	EPA 5030B	
AWJ0065-01	13-HLA-HC-01-1002	Total	Water	EPA 5030B	
AWJ0065-02	13-HLA-HC-06-1001	Total	Water	EPA 5030B	
AWJ0065-03	13-HLA-HC-03-1005	Total	Water	EPA 5030B	
AWJ0065-04	13-HLA-MW-08-1003	Total	Water	EPA 5030B	
AWJ0065-05	13-HLA-MW-Z-1004	Total	Water	EPA 5030B	
AWJ0065-06	13-HLA-MW-10-1006	Total	Water	EPA 5030B	

Prep Batch: 13J0127_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
13J0127-BLK1	Method Blank	Total	Water	EPA 5030B	
13J0127-BS1	Lab Control Sample	Total	Water	EPA 5030B	
13J0127-BS2	Lab Control Sample	Total	Water	EPA 5030B	
13J0127-BSD1	Lab Control Sample Dup	Total	Water	EPA 5030B	
13J0127-BSD2	Lab Control Sample Dup	Total	Water	EPA 5030B	
13J0127-DUP1	Duplicate	Total	Water	EPA 5030B	
AWJ0065-07 - RE1	13-HLA-TB-01-1007	Total	Water	EPA 5030B	

Client Sample ID: 13-HLA-HC-01-1002

Lab Sample ID: AWJ0065-01

Date Collected: 10/24/13 16:15

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.781	13K0008_P	11/04/13 08:20	MA	TAL ANC
Total	Analysis	AK 102		1.00	W000627	11/04/13 16:46	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13J0114_P	10/28/13 14:30	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B		10.0	W000611	10/29/13 13:35	ASD	TAL ANC

Client Sample ID: 13-HLA-HC-06-1001

Lab Sample ID: AWJ0065-02

Date Collected: 10/24/13 14:00

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.877	13K0008_P	11/04/13 08:20	MA	TAL ANC
Total	Analysis	AK 102		1.00	W000628	11/04/13 16:46	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13J0114_P	10/28/13 14:30	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B		1.00	W000611	10/29/13 10:26	ASD	TAL ANC

Client Sample ID: 13-HLA-HC-03-1005

Lab Sample ID: AWJ0065-03

Date Collected: 10/24/13 16:45

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 3510		0.794	13K0008_P	11/04/13 08:20	MA	TAL ANC
Total	Analysis	AK 102		1.00	W000627	11/04/13 17:18	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13J0114_P	10/28/13 14:30	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B		1.00	W000611	10/29/13 12:14	ASD	TAL ANC

Client Sample ID: 13-HLA-MW-08-1003

Lab Sample ID: AWJ0065-04

Date Collected: 10/24/13 16:00

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270C SIM		50	21607	10/29/13 19:05	NAF	TAL PRT
Total/NA	Analysis	8270C SIM		1	21607	10/29/13 13:46	NAF	TAL PRT
Total/NA	Prep	3520C			21503	10/28/13 11:59	CAD	TAL PRT
Total/NA	Analysis	8270C SIM		10	21607	10/29/13 14:44	NAF	TAL PRT
Total/NA	Analysis	8270C SIM		50	22059	11/13/13 15:50	NAF	TAL PRT
Total	Prep	EPA 3510		0.794	13K0008_P	11/04/13 08:20	MA	TAL ANC
Total	Analysis	AK 102		1.00	W000628	11/04/13 17:18	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13J0114_P	10/28/13 14:30	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B		100	W000611	10/29/13 14:02	ASD	TAL ANC

Lab Chronicle

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Client Sample ID: 13-HLA-MW-Z-1004

Lab Sample ID: AWJ0065-05

Date Collected: 10/24/13 16:00

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3520C			21503	10/28/13 11:59	CAD	TAL PRT
Total/NA	Analysis	8270C SIM		10	21607	10/29/13 18:35	NAF	TAL PRT
Total/NA	Analysis	8270C SIM		50	21607	10/29/13 19:33	NAF	TAL PRT
Total/NA	Analysis	8270C SIM		1	21607	10/29/13 14:15	NAF	TAL PRT
Total/NA	Analysis	8270C SIM		50	22059	11/13/13 16:18	NAF	TAL PRT
Total	Prep	EPA 3510		0.794	13K0008_P	11/04/13 08:20	MA	TAL ANC
Total	Analysis	AK 102		1.00	W000627	11/04/13 17:50	KDC	TAL ANC
Total	Prep	EPA 5030B		1.00	13J0114_P	10/28/13 14:30	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B		100	W000611	10/29/13 12:41	ASD	TAL ANC

Client Sample ID: 13-HLA-MW-10-1006

Lab Sample ID: AWJ0065-06

Date Collected: 10/24/13 17:00

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 5030B		1.00	13J0114_P	10/28/13 14:30	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B		1.00	W000611	10/29/13 13:08	ASD	TAL ANC

Client Sample ID: 13-HLA-TB-01-1007

Lab Sample ID: AWJ0065-07

Date Collected: 10/24/13 17:30

Matrix: Water

Date Received: 10/25/13 09:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	EPA 5030B	RE1	1.00	13J0127_P	10/30/13 18:58	AD	TAL ANC
Total	Analysis	AK101/EPA 8021B	RE1	1.00	W000618	10/31/13 11:30	ASD	TAL ANC

Laboratory References:

TAL ANC = TestAmerica Anchorage, 2000 West International Airport Road Suite A10, Anchorage, AK 99502-1119, TEL (907) 563-9200

TAL PRT = TestAmerica Portland, 9405 SW Nimbus Ave., Beaverton, OR 97008, TEL (503)906-9200

Certification Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Laboratory: TestAmerica Anchorage

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	AK00975	06-30-14
Alaska (UST)	State Program	10	UST-067	06-16-14

Laboratory: TestAmerica Portland

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-012	12-26-13
California	State Program	9	2597	09-30-15
Oregon	NELAP	10	OR100021	01-09-14
USDA	Federal		P330-11-00092	02-17-14
Washington	State Program	10	C586	06-23-14

Method Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Method	Method Description	Protocol	Laboratory
8270C SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL PRT
AK 102	Diesel Range Organics (C10-C25) per AK102		TAL ANC
AK101/EPA 8021B	Gasoline Range Organics (C6-C10) and BTEX per AK101		TAL ANC

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL ANC = TestAmerica Anchorage, 2000 West International Airport Road Suite A10, Anchorage, AK 99502-1119, TEL (907) 563-9200

TAL PRT = TestAmerica Portland, 9405 SW Nimbus Ave., Beaverton, OR 97008, TEL (503)906-9200

Sample Summary

Client: ERM Alaska, Inc.
Project/Site: 0220880

TestAmerica Job ID: AWJ0065

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
AWJ0065-01	13-HLA-HC-01-1002	Water	10/24/13 16:15	10/25/13 09:54
AWJ0065-02	13-HLA-HC-06-1001	Water	10/24/13 14:00	10/25/13 09:54
AWJ0065-03	13-HLA-HC-03-1005	Water	10/24/13 16:45	10/25/13 09:54
AWJ0065-04	13-HLA-MW-08-1003	Water	10/24/13 16:00	10/25/13 09:54
AWJ0065-05	13-HLA-MW-Z-1004	Water	10/24/13 16:00	10/25/13 09:54
AWJ0065-06	13-HLA-MW-10-1006	Water	10/24/13 17:00	10/25/13 09:54
AWJ0065-07	13-HLA-TB-01-1007	Water	10/24/13 17:30	10/25/13 09:54

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

5755 8th Street East, Tacoma, WA 98424-1317 253-922-2310 FAX 922-5047
11922 E. First Ave., Spokane WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave., Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210

CHAIN OF CUSTODY REPORT

Work Order #: AWJ0065

CLIENT: ERM ALASKA
REPORT TO: 825 W 8TH AVE
ADDRESS: ANCHORAGE AK 99501
PHONE: 258-4880 FAX:

INVOICE TO:
P.O. NUMBER:

PROJECT NAME: HORIZON LINES LTM
PROJECT NUMBER: 0220880
SAMPLED BY: K. JOHNSON, S. CHRISTIANSEN

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: (10) STD. | 7 | 5 | 4 | 3 | 2 | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	PRESERVATIVE			REQUESTED ANALYSES									MATRIX (W, S, O)	# OF CONT.	LOCATION/ COMMENTS	TA WO ID
				HCl-HCl	None	GRO/ BTEX	DRO	PAH										
1	13-HLA-HC-01-1002	10/24 1615				X	X	[redacted]								W	5		01
2	13-HLA-HC-06-1001	10/24 1400				X	X									W	15	MS/MSD	02
3	13-HLA-HC-08-1005	10/24 1645				X	X									W	5		03
4	13-HLA-MW-08-1003	10/24 1600				X	X	X								W	7		04
5	13-HLA-MW-Z-1004	10/24 1800				X	X	X								W	7		05
6	13-HLA-MW-10-1006	10/24 1700				X										W	2	limited quantity	06
7	13-HLA-TB-01-1007	10/24 1730				X										W	3		07
8																			
9																			
10																			

RELEASED BY: Joe Casey	FIRM: ERM	DATE: 10/25/13	RECEIVED BY: Andrew Pick	FIRM: TA-AK	DATE: 10/25/13
PRINT NAME: Joe Casey		TIME: 9:54	PRINT NAME: Andrew Pick		TIME: 9:54
RELEASED BY:	FIRM:	DATE:	RECEIVED BY:	FIRM:	DATE:
PRINT NAME:		TIME:	PRINT NAME:		TIME:

ADDITIONAL REMARKS:

TEMP: 2.6°C PAGE OF

TAL-1000 (0612)

Test America Cooler Receipt Form

(Army Corps. Compliant)

WORK ORDER # AWJ0065 CLIENT: ~~Horizon Lines LLM~~ AP 10/25 ERM-AK PROJECT: Horizon Lines LTM

Date /Time Cooler Arrived 10 / 25 / 13 · 9 : 54 Cooler signed for by: Andrew Pilch (Print name)

Preliminary Examination Phase:

Date cooler opened: ☒ same as date received *or* ___/___/___

Cooler opened by (print) Andrew Pilch (sign) Andrew Pilch

1. Delivered by ☐ ALASKA AIRLINES ☐ Fed-Ex ☐ UPS ☐ NAC ☐ LYNDEN ☒ CLIENT ☐ Other:

Shipment Tracking # if applicable _____ (include copy of shipping papers in file)

2. Number of Custody Seals 1 Signed by see back Date __/__/__

Were custody seals unbroken and intact on arrival?	☒ Yes	☐ No	
3. Were custody papers sealed in a plastic bag?	☒ Yes	☐ No	
4. Were custody papers filled out properly (ink, signed, etc.)?	☒ Yes	☐ No	
5. Did you sign the custody papers in the appropriate place?	☒ Yes	☐ No	

6. Was ice used? ☒ Yes ☐ No Type of ice: ☐ blue ice ☒ gel ice ☐ real ice ☐ dry ice Condition of Ice: mostly hard

Temperature 2.6 °C (**corrected**) Thermometer # Rec #5

7. Packing in Cooler: ☒ bubble wrap ☐ styrofoam ☐ cardboard ☐ Other: _____

8. Did samples arrive in plastic bags?	☒ Yes	☐ No	
9. Did all bottles arrive unbroken, and with labels in good condition?	☒ Yes	☐ No	
10. Are all bottle labels complete (ID, date, time, etc.)	☒ Yes	☐ No	
11. Do bottle labels and Chain of Custody agree?	☐ Yes	☒ No	see email - AP 10/25/13
12. Are the containers and preservatives correct for the tests indicated?	☒ Yes	☐ No	
13. Conoco Phillips, Alyeska, BP H2O samples only, pH <2?	☐ Yes	☐ No	☒ N/A
14. Is there adequate volume for the tests requested?	☒ Yes	☐ No	
14. Is there dry weight volume provided?	☒ Yes	☐ No	
15. Were VOA vials free of bubbles? ☐ N/A	☒ Yes	☐ No	

If "NO" which containers contained "head space" or bubbles? _____

16. Are methanol soils immersed in methanol?	☐ Yes	☐ No	☒ N/A

Log-in Phase:

Date of sample log-in 10 / 25 / 13

Samples logged in by (print) Andrew Pilch (sign) Andrew Pilch

1. Was project identifiable from custody papers?	☒ Yes	☐ No
2. Do Turn Around Times and Due Dates agree?	☒ Yes	☐ No
3. Was the Project Manager notified of status?	☒ Yes	☐ No
4. Was the Lab notified of status?	☒ Yes	☐ No
5. Was the COC scanned and copied?	☒ Yes	☐ No

AK-FORM-SPL-005 5 October 2011

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
911271

Custody Seal

DATE 10-24-13

SIGNATURE [signature]

AWJ0065

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
911271

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APPENDIX C

Quality Assurance Checklists

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Laboratory Data Review Checklist

Completed by:	Elsie King		
Title:	Chemist	Date:	Nov 19, 2013
CS Report Name:	Horizon Lines of Alaska, LLC Port of Anchorage LTM	Report Date:	Nov 19, 2013
Consultant Firm:	ERM Alaska, Inc.		
Laboratory Name:	TestAmerica	Laboratory Report Number:	AWJ0065
ADEC File Number:	2011.26.238	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:

TestAmerica in Anchorage, AK and in Portland, Oregon

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:

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° ± 2° C)?

(•) Yes ( ) No ( ) NA (Please explain) Comments:

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:

d. If there were any discrepancies, were they documented? - For example, incorrect sample containers/ preservation, sample temperature outside of acceptance range, insufficient or missing samples, etc.?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

Limited volume was received for AK101/8021B analyses on sample 13-HLA-MW-10-1006. There was adequate volume for the analyses.

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

Comments:

No data flags were added for sample receipt. All sample results are acceptable.

4. Case Narrative

a. Present and understandable?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

AK101/8021B: Dilutions were required due to matrix for samples13-HLA-HC-01-1002, 3-HLA-MW-08-1003 and 3-HLA-MW-Z-1004; High surrogate recovery for sample 13-HLA-MW-10-1006. 8270C SIM: Dilutions were required due to matrix for samples 13-HLA-MW-08-1003 and 13-HLA-MW-Z-1004.

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

(●) Yes ( ) No ( ) NA (Please explain) Comments:

See above.

c. Were all corrective actions documented?

(●) Yes ( ) No ( ) NA (Please explain) Comments:

No corrective actions were required in these instances. Reporting limits met requirements for the diluted samples.

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

Comments:

The data was acceptable for project use. See section 6 for surrogate recovery discussion.

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:

Water samples

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:

The RL for dibenzo(ah)anthracene does not meet the ADEC groundwater cleanup level of 0.00022 mg/L. However, the MDL of 0.00011 mg/L for this compound is below the ADEC cleanup level.

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

Comments:

Data is acceptable as reported. The MDL is included for the dibenzo(ah)anthracene results.

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:

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

NA - All method blank results below PQL.

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

(•) Yes ( ) No ( ) NA (Please explain) Comments:

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

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:

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

( ) Yes ( ) No (•) NA (Please explain) Comments:

Only organics in this report

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/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

( ) Yes (•) No ( ) NA (Please explain) Comments:

AK101/8021B: The batch duplicate RPD was above the limit for GRO and BTEX.

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

Comments:

NA- The AK101/8021B batch duplicate sample was not from this project. The method required LCS/ LCSD and MS/MSD RPDs were acceptable.

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

○ Yes ◉ No ○ NA (Please explain) Comments:

No flags were required for samples reported for this project.

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

The data is acceptable.

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:

AK101: High surrogate %R for 13-HLA-MW-10-1006.

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:

AK101: GRO result in this sample is qualified JS for the high surrogate recovery.

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

Comments:

The GRO result may be biased high due to matrix interference.

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:

One COC was included with the sample cooler. The VOC samples were packed in a single cooler with the trip blank. The lab noted that the trip blank was in the cooler with the VOC 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:

The lab noted that the trip blank was in the cooler with the VOC samples.

iii. All results less than PQL?

◉ Yes ○ No ○ NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

NA- all results were below the PQL.

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

Comments:

The data is acceptable for project use.

e. Field Duplicate

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

◉ Yes ○ No ○ NA (Please explain) Comments:

13-HLA-MW-08-1003 and 13-HLA-MW-Z-1004 for AK101/8021B, AK102 and 8270C SIM

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:

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

○ Yes ○ No ◉ NA (Please explain) Comments:

NA - The RPDs were acceptable.

f. Decontamination or Equipment Blank (if applicable)

○ Yes ○ No ◉ NA (Please explain) Comments:

Disposable sampling equipment was used.

i. All results less than PQL?

○ Yes ○ No ◉ NA (Please explain) Comments:

Disposable sampling equipment was used.

ii. If above PQL, what samples are affected?

Comments:

NA-Disposable sampling equipment was used.

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

Comments:

NA-Disposable sampling equipment was used.

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

a. Defined and appropriate?

◉ Yes ○ No ○ NA (Please explain) Comments:

Lab flags defined in lab report.

Reset Form

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TABLE A-1

Surrogate Recovery Result Exceedances

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Associated Analytes	Sample Result	Units	ERM Qualifier
AWJ0065	13-HLA MW-10-1006	AK101	4-Bromofluorobenzene	160	50-150	GRO	137	ug/L	J-S

Laboratory Reports Reviewed: TA AWJ0065

Key:
J-S = Estimated detected result due to high surrogate recovery

TABLE A-2

Duplicate Results and Calculated Relative Percent Differences

Lab Package	Method	Primary Sample ID/ Duplicate Sample ID	Compound	Concentration Sample	Concentration DUP	RPD Limit	Units	Sample RL/LOQ	DUP RL/LOQ	RPD %	ERM Qualifier
Field Duplicates											
AWJ0065	AK101	13-HLA-MW-08-1003/	Gasoline Range Organics	24,100	27,400	≤30	ug/L	5,000	5,000	13	NA
		13-HLA-MW-Z-1004									
	8021B		Benzene	1,380	1,430	≤30	ug/L	50	50	4	NA
			Toluene	130	138	≤30	ug/L	50	50	6	NA
			Ethylbenzene	1,510	1,630	≤30	ug/L	50	50	8	NA
			Xylenes, total	11,000	12,000	≤30	ug/L	150	150	9	NA
	AK102		Diesel Range Organics	17.7	15.2	≤30	mg/L	2.70	0.6	15.2	NA
	8270C SIM		Acenaphthene	1.4	1.0	≤30	ug/L	1.1	1.1	33.3	NA
			Fluorene	0.70	0.68	≤30	ug/L	1.1	1.1	2.9	NA
			Naphthalene	210	220	≤30	ug/L	5.6	5.6	4.7	NA
			1-Methylnaphthalene	47	50	≤30	ug/L	5.6	5.6	6.2	NA
			2-Methylnaphthalene	75	79	≤30	ug/L	5.6	5.6	5.2	NA

Laboratory Reports Reviewed: TA AWJ0065

Notes:

Dup= Duplicate
NA = Not applicable
RL/LOQ = Reporting limit or limit of quantitation
RPD = Relative percent difference
mg/L =milligram per liter
ug/L = microgram per liter

APPENDIX D

Conceptual Site Model

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Print Form

Human Health Conceptual Site Model
Scoping Form

Site Name: CSX Lines, LLC - formerly Sealand Freight Services Inc.

File Number: 2100.26.238

Completed by: Erin McDonald

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: Follow the italicized instructions in each section below.

1. General Information:

Sources *(check potential sources at the site)*

- ☒ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☐ Other:

Release Mechanisms *(check potential release mechanisms at the site)*

- ☒ Spills
- ☒ Leaks
- ☐ Direct discharge
- ☐ Burning
- ☐ Other:

Impacted Media *(check potentially-impacted media at the site)*

- ☐ Surface soil (0-2 feet bgs*)
- ☒ Subsurface soil (>2 feet bgs)
- ☐ Air
- ☐ Sediment
- ☒ Groundwater
- ☐ Surface water
- ☐ Biota
- ☐ Other:

Receptors *(check receptors that could be affected by contamination at the site)*

- ☐ Residents (adult or child)
- ☒ Commercial or industrial worker
- ☒ Construction worker
- ☐ Subsistence harvester (i.e. gathers wild foods)
- ☐ Subsistence consumer (i.e. eats wild foods)
- ☒ Site visitor
- ☒ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs - below ground surface

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete: Complete

Comments:

Contamination is present between 0-15 feet below ground surface. However, the area of contamination is under a paved parking lot and road-way. For incidental soil ingestion to occur the asphalt would have to be removed or disturbed.

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

The contaminants of concern at the site are not listed in Appendix B. However, naphthalene, a constituent in diesel fuel is recognized as a potential risk for dermal exposure. Naphthalene is present in groundwater at the site, below the 18 AAC 75, Table C criteria, but above the screening level of 1/10th. The concentration of naphthalene in site soils is unknown.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the ground-water is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future? ☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities). ☐

If both boxes are checked, label this pathway complete: Incomplete

Comments:

The nearest surface water body, Cook Inlet, could not be used as a current or future drinking water source, due to salinity.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods? ☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)? ☒

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.) ☒

If all of the boxes are checked, label this pathway complete: Incomplete

Comments:

Benzo(a)pyrene and Dibenzo(a,h)anthracene where not detected at the site above method reporting limits (MRLs), however the MRLs were above the screening level. Though these compounds are listed in Appendix C, the site is industrial and secured which prevents the harvest and ingestion of wild foods.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

The area of contamination is paved and located adjacent to a building which is used as an auto shop, warehouse and for vehicle fueling.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminted soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures) ☒

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)? ☒

If both boxes are checked, label this pathway complete: Complete

Comments:

The adjacent building is used as an auto shop, warehouse and for vehicle fueling.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Contaminant concentrations in groundwater exceed the ADEC groundwater cleanup levels in 18 AAC 75, Table C. Exposure to groundwater could occur during construction activities.

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

The contaminated water is not used for indoor household purposes.

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM_{10}). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Nonvolatile compounds are not found in the top 2 centimeters of soil.

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed: ☐

Comments:

Sediment is not present at the site.

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

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HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: CSX Lines, LLC - Formerly Sealond Freight Services, Inc.

Completed By: Erin McDonald

Date Completed: December 8, 2011

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

Media	Transport Mechanisms	check
☐ Surface Soil (0-2 ft bgs)	Direct release to surface soil	check soil
	☐ Migration to subsurface	check soil
	☐ Migration to groundwater	check groundwater
	☐ Volatilization	check air
	☐ Runoff or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☑ Subsurface Soil (2-15 ft bgs)	Direct release to subsurface soil	check soil
	☑ Migration to groundwater	check groundwater
	☑ Volatilization	check air
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☑ Ground-water	Direct release to groundwater	check groundwater
	☑ Volatilization	check air
	☐ Flow to surface water body	check surface water
	☐ Flow to sediment	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Surface Water	Direct release to surface water	check surface water
	☐ Volatilization	check air
	☐ Sedimentation	check sediment
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	
☐ Sediment	Direct release to sediment	check sediment
	☐ Resuspension, runoff, or erosion	check surface water
	☐ Uptake by plants or animals	check biota
	☐ Other (list):	

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ soil	☑ Incidental Soil Ingestion				F			
	☑ Dermal Absorption of Contaminants from Soil				F			
	☐ Inhalation of Fugitive Dust							
☑ groundwater	☑ Ingestion of Groundwater				F			
	☑ Dermal Absorption of Contaminants in Groundwater				F			
	☐ Inhalation of Volatile Compounds in Tap Water							
☑ air	☑ Inhalation of Outdoor Air		F	F	F			
	☑ Inhalation of Indoor Air		C/F	C/F	C/F			
	☐ Inhalation of Fugitive Dust							
☐ surface water	☐ Ingestion of Surface Water							
	☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Inhalation of Volatile Compounds in Tap Water							
☐ sediment	☐ Direct Contact with Sediment							
☐ biota	☐ Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

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