December 19, 2011

Mr. Stephen Wilson
Director, Safety, Security, Quality & Environmental Stewardship
Crowley Maritime Corporation
1102 SW Massachusetts Street
Seattle, WA 98134-1030
Via e-mail: Stephen.Wilson@crowley.com

Re: Groundwater Monitoring Report; Nenana Header Area (ADEC File No. 110.38.010) and Rail Line Site (ADEC File No. 110.38.011); Nenana, Alaska

Dear Mr. Wilson:

OASIS Environmental, Inc. (OASIS) is submitting this letter report to Crowley Maritime Corporation (Crowley) to document the results of groundwater monitoring activities conducted at the Nenana Header Area and Rail Line Site located in Nenana, Alaska (Figures 1 and 2, Attachment 1). The Crowley Nenana sites are located at approximately 64.564688° north latitude and -149.100866° west longitude, on the south shore of the Tanana River. Nenana is located approximately 55 road miles south of Fairbanks, Alaska. Groundwater monitoring activities were conducted to further evaluate the nature and extent of impact to groundwater, and evaluate seasonal changes to groundwater elevation and gradient.

OASIS performed groundwater monitoring activities on September 27 and September 28, 2011. Monitoring activities included gauging and sampling each of the five permanent wells and six temporary wells located at the site. The well house well was also sampled (Figure 2). All groundwater samples were sent to ESC Lab Sciences, Inc. (ESC), an Alaska Department of Environmental Conservation (ADEC)-approved offsite laboratory, located in Mount (Mt.) Juliet, Tennessee (TN).

PROJECT SCOPE AND OBJECTIVES

The scope work for the groundwater monitoring work reported herein was to gather additional information regarding the nature of petroleum hydrocarbon impact to groundwater at the site including the possible impact by leaded fuels, and evaluate concentration trend. Past sampling of groundwater did not include sampling for lead and lead associated contaminant. Secondarily, information regarding groundwater elevation and flow direction was desired. The following tasks were listed in the work plan to be performed to meet the objectives:

- Collect groundwater samples from monitoring wells MW-1 through MW-5 and temporary well points TP-1 through TP-6;
- Collect a groundwater sample from the Well House well;
- Locate a second well alleged to be present at the site and sample this well;

- Collect groundwater samples for known contaminants of concern including gasoline-range organics (GRO), diesel-range organics (DRO), and benzene, toluene, ethylbenzene, total xylenes (BTEX), at all monitoring wells, temporary well points, and pre-existing site wells;
- Evaluate for the presence of fuel related contaminants which include total lead; ethylene dibromide (EDB; a.k.a. 1,2-dibromoethane); ethylene dichloride (EDC; a.k.a. 1,2-dichloroethane [1,2-DCA]); naphthalene; methyl tert-butyl ether (MTBE), and lead, at all monitoring wells, temporary well points, and pre-existing site wells;
- Gather groundwater elevation information to determine the groundwater flow direction and calculate groundwater gradient; and,
- Prepare a report detailing the analytical results as compared to relevant ADEC groundwater cleanup criteria.

SITE BACKGROUND

In September and October 2010, OASIS conducted initial groundwater characterization activities at the Nenana Header and Nenana Rail sites. Characterization work included the installation of temporary groundwater sampling points, five permanent groundwater-monitoring wells, and subsurface soil sampling at co-located soil borings.

Based on the findings from the fall 2010 initial characterization work, additional characterization activities were conducted in May 2011 to define the extent of impact at both sites as a whole. The additional site characterization activities performed in May 2011 included the installation of 26 soil borings (SBs) by direct-push and co-located temporary groundwater sample locations. At each of the 26 SBs, two subsurface soil samples were collected after screening the soil cores with a photo-ionization detector (PID). Groundwater samples were collected at 20 locations using a reusable direct-push sampler with retractable screen. At six locations, pre-packed PVC temporary wells were installed and sampled. Permanent groundwater monitoring wells installed in the fall of 2010 were also sampled. Based on analytical results from the fall 2010 and spring 2011 characterization work, the majority of impact to soil has been defined:

- Impact to soil at the Header Area at concentrations above ADEC Method Two soil cleanup levels (SCLs) has been defined in the vicinity of the header manifold. Impact at the Header Area includes benzene, GRO, and DRO in concentrations exceeding associated ADEC Method Two SCLs.
- At the Rail Line site, located along the north and northwest side of the Middle Tank Farm, soil is impacted with GRO, DRO, BTEX, naphthalene, 1-methylnaphalene, and 2-methylnapthalene at concentrations exceeding associated ADEC Method Two SCLs. Soil located outside of the immediate vicinity of the Rail Line is impacted with benzene above the ADEC Method Two SCL at various depths. Soil south and west of the Rail Line and Middle Tank Farm has not been impacted.

Impact to groundwater has also been defined; impact extends from east of the Header Area, along the Tanana River, and from the Rail Line area and north towards the Tanana River. Groundwater is impacted with benzene in the Header Area in a narrow area running along the Tanana River. Groundwater is also

impacted by GRO and DRO at concentrations above ADEC Table C groundwater cleanup levels (GCLs) in the immediate vicinity of the header manifold, at the former storage tank location, and along piping between the header and Middle Tank Farm. Groundwater between the Rail Line and the Tanana River is impacted with GRO, DRO, and BTEX above ADEC Table C GCLs. Groundwater is not impacted southeast, south, and west of the Rail Line and Middle Tank Farm. Analytical results for a groundwater sample collected from the Well House well, formerly used by Crowley Petroleum Distribution for non-potable purposes, located south of the Middle Tank Farm and east of the former Lower Tank Farm, did not indicate impact.

FIELD ACTIVITIES

OASIS conducted groundwater monitoring activities between September 27 and 28, 2011. Fieldwork was performed by OASIS in accordance with the ADEC-approved work plan (OASIS 2011). To evaluate and establish dissolved-phase hydrocarbon plume trends, groundwater samples were scheduled to be collected from each of the five monitoring wells (MW-1 through MW-5), and each of six temporary well points (TP-1 through TP-5). However, groundwater was not collected at two locations for the following reasons:

- TP-1 was not sampled as no water was present; the total depth of TP-1 is 10 feet bgs, which may be too shallow at this location.
- TP-3 was not sampled due to being damaged by a lawn mower or similar grass cutting equipment.

Table 1 (Attachment 2) presents a summary of samples collected and analysis conducted for each well location. Field activities were documented in a bound logbook, with sampling information recorded on separate well sampling data sheets. All field documents are provided in Attachment 3. A photographic log is provided as Attachment 4.

As part of the field effort, OASIS interviewed Crowley's Nenana personnel regarding the use of groundwater available from the Well House well and the location of any additional wells that may be at the site. Crowley personnel stated only one well remains at the site; the Well House well. The temporary camps (located on the western boundary of the site) haul water from the city. The water is stored in large plastic tanks. OASIS has included photographs of the water storage tanks in the photographic log provide as Attachment 4.

Groundwater Elevation and Flow Direction

Prior to sampling, all wells were gauged for depth-to-water (DTW). No indication of separate-phase hydrocarbons was encountered during this or past sampling events at the site during gauging. DTW and groundwater elevation data are provided in Table 2 (Attachment 3) for the September 2011 monitoring event.

Groundwater appears to flow from the south to the north, with a lesser gradient from the east to the west. Previous groundwater elevation data is proved in Table 3. Similar to fall 2010, groundwater was found to be about 9 to 11 feet bgs. Spring groundwater elevation, recorded in May 2011, was about 2 feet

shallower, at about 8 feet bgs across the site, than the elevation found during the fall. Inferred groundwater contours are depicted on Figure 3, Attachment 1.

Sampling and Analytical Methods

After gauging each well and temporary well point for DTW, OASIS purged each well following the United States Environmental Protection Agency (USEPA) low-flow technique using a peristaltic pump and YSI® Model 556 water quality meter with flow-through cell. The water quality meter was used to establish successive readings for dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, temperature, and conductivity. Monitoring wells were purged at a rate between 0.1 and 0.5 liters per minute. While purging, water quality parameters were monitored and recorded every 3 to 5 minutes until pH was stable within 0.1 pH units, temperature was stable within 0.2 degrees Celsius (C°), and conductivity was stable within 3%. Once stability was achieved, sample collection was initiated.

Water Quality

Field collected water quality parameters and observations of odor and color for each well are summarized in Table 4, Attachment 2. ORP values were low or negative, indicating a reducing environment. DO was similarly very low, indicating an oxygen deficient regime. The pH was within normal range for potential natural attenuation to occur. Conductivity was consistent across the site.

Groundwater Sampling

Upon stabilization, the flow-through cell was disconnected from the flow-line and samples were collected directly from the flow-line using dedicated tubing. Samples were labeled with the proper analytical method and pre-assigned alpha-numeric sample identification number and placed in a cooler on ice.

Quality Control samples were collected or prepared to assess potential errors introduced during sample collection, handling, and analyses. As part of the field quality assurance/quality control (QA/QC) program, field duplicate and trip blank samples were collected as well as extra volumes for matrix spike/matrix spike duplicate (MS/MSD) procedures. Duplicate samples were collected from wells with historical or assumed high contaminant concentrations. One duplicate sample was collected for every ten primary samples. MS/MSD samples were collected from wells with documented or assumed low levels of contaminants. MS/MSD samples were collected at a rate of one per every 20 primary samples. Samples were kept chilled between 2°C and 6°C until field activities were completed. Samples were then delivered to FexEx® via the field team to be shipped overnight to ESC laboratory in Mt. Juliet, TN for analysis.

OASIS collected a total of ten project groundwater samples, one duplicate sample, and one MS/MSD volume. Additionally, five volatiles trip blanks accompanied the samples from the project laboratory, to the field, and back to the project laboratory.

All groundwater samples were submitted for the following analysis:

- GRO by Alaska (AK) Method 101 (AK 101);
- BTEX, MTBE, EDB, EDC, and naphthalene by USEPA Solid Waste Method (SW) 8260B;

- Low-level EDB by USEPA SW8011;
- DRO and residual-range organics (RRO) by AK 102/103; and,
- Lead by USEPA SW6020B.

All samples were shipped, under chain-of-custody procedures, to ESC. Analytical Table 5 (Attachment 2) presents a summary of the samples collected and laboratory analysis requested for this monitoring event.

ANALYTICAL RESULTS

Table 5 (Attachment 2) presents a summary of the analytical results in comparison to the ADEC 18AAC75 Table C GCLs. Analytical results are also presented in Figure 4 (Attachment 1). For comparison to historical trends, Table 6 presents analytical concentration trends. Analytical data results with ADEC Checklists and Quality Assurance Report (QAR) are provided in Attachment 4.

Similar to previous analytical results, impact to groundwater in the vicinity of the Header Area, as defined by MW-1, MW-2, MW-3, MW4, and TP-2, indicates a narrow benzene plume in concentrations above ADEC GCLs beginning west of MW-1 and east to MW-4 and extending east of TP-2. In addition to benzene, DRO was detected above the ADEC Table C GCLs at three locations along the river edge: MW-3, MW-4, and TP-2. The only location where GRO was detected above the ADEC Table C GCLs was at MW-4. Naphthalene, EDB, EDC, MTBE, and lead were either non-detect, or detected below ADEC Table C groundwater cleanup levels GCLs in all groundwater samples collected from the header area. Analytical results for samples collected from MW-2, located south of the header area, did not indicate impact for any contaminant of concern at a concentration above ADEC Table C groundwater cleanup level GCLs. Although TP-1 was dry, MW-1 appears to not have a benzene impact as previously found in the fall of 2010, indicating the upper limit of benzene impact may lie west of MW-1.

Four sample locations, MW-5, TP-4, TP-5, and TP-6 aid in defining the impact to groundwater at the Rail Line site. At MW-5 and TP-5 (directly adjacent to the rail line), GRO, DRO, benzene, toluene, ethylbenzene, naphthalene, EDC, EDB, and lead were detected at concentrations above ADEC Table C GCLs. At MW-5, located approximately 80 feet west of the Rail Line and 30 feet south of the Tanana River, benzene, GRO, and EDC were detected above the ADEC Table C GCLs. The western boundary of the impact to groundwater was defined by analytical results from previous sampling events and locations. Analytical results for samples collected from TP-4, located south of the Rail Line area, and TP-6 located east of the Rail Line area, did not indicate impact for any contaminant of concern at a concentration above ADEC Table C GCLs.

OASIS collected one sample from Well House well located south of the former Middle Tank Farm and east of the former Lower Tank Farm. All results were reported as not detected above the method detection limits with the exception of DRO and lead. DRO was detected at 0.048 mg/L and lead was detected at 0.0052 milligrams per liter (mg/L), both below the ADEC Table C GCLs DRO of 1.5 mg/L and lead at 0.015 mg/L.

CONCEPTUAL SITE MODEL

An updated ADEC conceptual site model (CSM) scoping form and graphic are included in Attachment 6.

Analytical evidence from current and past sampling events indicate that surface soil (0–2 feet bgs), subsurface soil (2 to 15 feet bgs), and groundwater at the site are impacted by petroleum hydrocarbons at concentrations that exceed ADEC cleanup criteria. Surface water and sediment are also potentially impacted media; however, no hydrocarbon impact was observed during the initial characterization.

Human health exposure routes may include ingestion, absorption, inhalation, and direct contact.

Possible receptors include current commercial or industrial workers; site visitors, trespassers, or recreational users; construction workers; and farmers or subsistence harvesters.

CONCLUSIONS

Groundwater impact at the header area is defined. It is possible benzene impact seasonally extends to the east of MW-1. The temporary pre-packed well, TP-1, was found to be dry during this sampling event; the depth of the well screen may be installed too shallow to intersect groundwater.

Groundwater at the Rail Line is impacted with GRO, DRO, BTEX, naphthalene, EDC, EDB, and lead in TP-5, which is located in the immediate vicinity of the Rail Line source area. Moving downgradient from the Rail Line towards the Tanana River, lighter hydrocarbons (benzene, GRO, and EDC) were reported in concentrations above cleanup levels, indicating migration in this direction. One clean groundwater sample exist between the Tanana and the Rail Line (TW-2) collected during the Initial Characterization conducted in September 2010; the figure depicting this location in relation to MW-5 and the Tanana River is included as Attachment 6. In this area, the river shore is a beach front; the steel bulk wall ends east of the Rail Line site.

OASIS thanks you for the opportunity to assist Crowley with this project. Please contact me at (907) 258-4880 if you have any question regarding this report.

Sincerely,

OASIS Environmental, Inc., an ERM Company

Ashley M. Hansen

Ashley Hansen
Environmental Scientist

Daniel M. Frank

Daniel Frank
Project Manager

Attachments:

1. Figures
2. Tables
3. Field Notes
4. Photographic Log
5. Quality Assurance Memorandum, ADEC Checklists, Laboratory Analytical Reports
6. Conceptual Site Model

REFERENCES

OASIS Environmental, Inc. (OASIS), 2011. Letter. Groundwater Monitoring Work Plan. September 21.

ATTACHMENT 1

Figures

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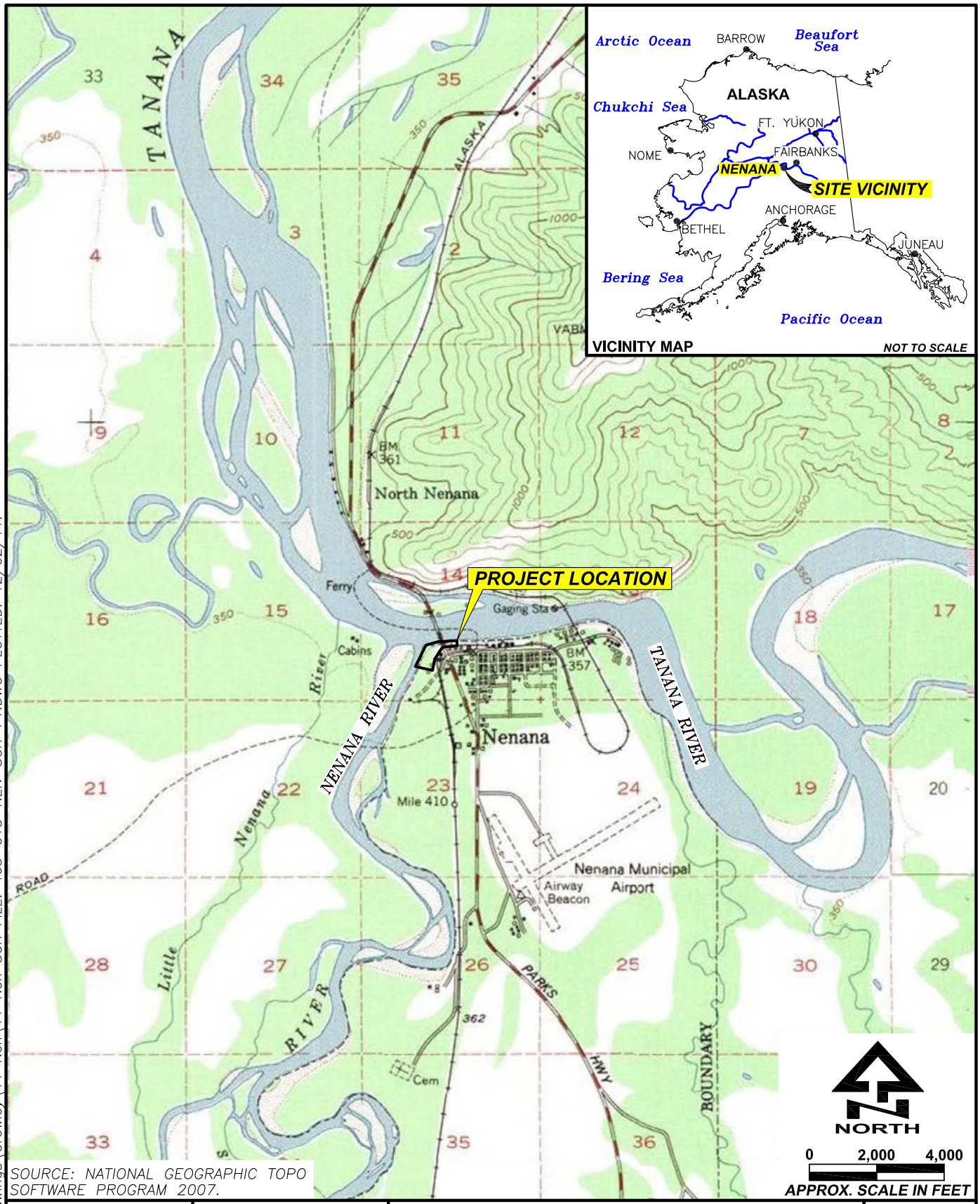

SOURCE: NATIONAL GEOGRAPHIC TOPO SOFTWARE PROGRAM 2007.

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PROJ. No.: 0147038

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SITE LOCATION MAP

NENANA HEADER AREA AND RAIL LINE SITE
GROUNDWATER MONITORING REPORT – SEPTEMBER 2011
CROWLEY MARITIME CORPORATION
Nenana, Alaska

FIGURE

1

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SITE OVERVIEW

NENANA HEADER AREA AND RAIL LINE SITE
GROUNDWATER MONITORING REPORT – SEPTEMBER 2011
CROWLEY MARITIME CORPORATION
Nenana, Alaska

FIGURE
2

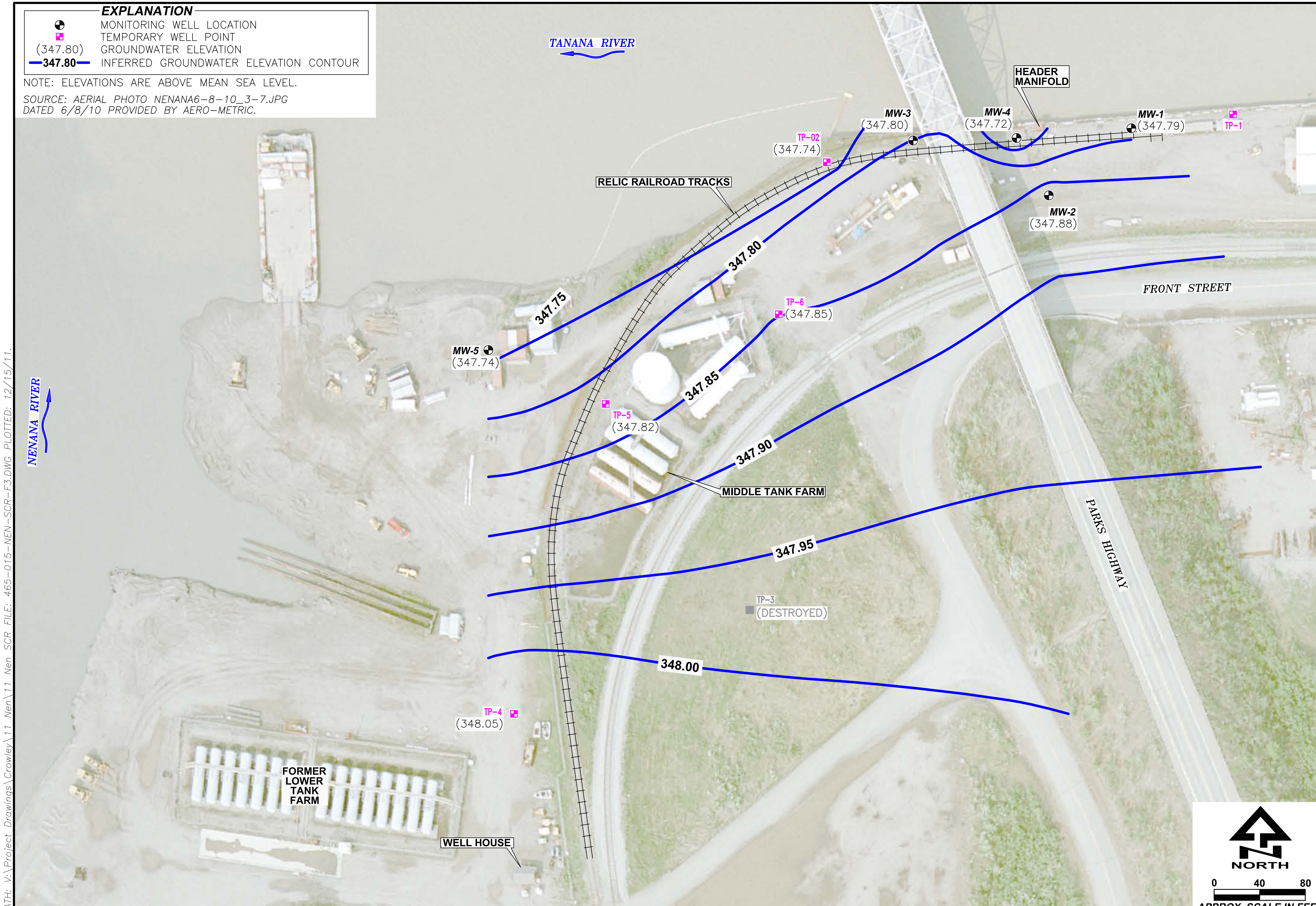

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FIGURE 3

GROUNDWATER AND SURFACE WATER ELEVATIONS AND INFERRED CONTOURS

NENANA HEADER AREA AND RAIL LINE SITE
GROUNDWATER MONITORING REPORT – SEPTEMBER 2011
CROWLEY MARITIME CORPORATION
Nenana, Alaska

DATE: DEC. 2011
CHKD: A.M.H.
DRAWN: S.M.C.
PROJ. No.: 0147038

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NORTH

0 30 60

APPROX. SCALE IN FEET

TP-2 (mg/L)		
Date	5-11	9-11
GRO	0.5	0.36
DRO	2.7	4.5
RRO	ND	0.17
B	0.002	0.0013
T	0.0006	0.0005
E	0.0056	0.0044
X	0.016	0.0093
Naph	0.038	0.087
EDC	NA	ND
Lead	NA	0.0018

MW-3 (mg/L)			
Date	10-10	5-11	9-11
GRO	0.672	NS	0.49
DRO	1.11	NS	2.2
RRO	0.259	NS	0.17
B	0.093	NS	0.058
T	0.0064	NS	0.0032
E	0.0095	NS	0.0069
X	0.0251	NS	0.015
Naph	0.0074	NS	0.0079
EDC	NA	NS	0.00074
Lead	NA	NS	0.0012

MW-4 (mg/L)			
Date	10-10	5-11	9-11
GRO	2.57	0.5	2.4
DRO	7.85	42	20
RRO	0.534	0.013	0.62
B	0.055	0.0004	0.01
T	0.032	0.019	0.0039
E	0.042	ND	0.0052
X	0.566	0.013	0.084
Naph	0.0074	NA	0.32
EDC	NA	NA	0.0009
Lead	NA	NA	0.0041

MW-1 (mg/L)			
Date	10-10	5-11	9-11
GRO	0.134	NS	ND
DRO	0.604	NS	0.65
RRO	0.119	NS	ND
B	0.005	NS	0.001
T	0.003	NS	ND
E	0.003	NS	0.001
X	0.012	NS	0.003
Naph	0.0243	NS	0.02
EDC	NA	NA	ND
Lead	NA	NS	0.0009

TP-1 (mg/L)		
Date	5-11	9-11
GRO	NS	NS
DRO	NS	NS
RRO	NS	NS
B	NS	NS
T	NS	NS
E	NS	NS
X	NS	NS
Naph	NS	NS
EDC	NS	NS
Lead	NS	NS

MW-5 (mg/L)			
Date	10-10	5-11	9-11
GRO	17.3	11	8.7
DRO	0.108	0.17	0.13
RRO	0.043	ND	ND
B	6.27	5.2	3.5
T	0.008	0.27	ND
E	0.065	0.04	ND
X	0.357	0.23	0.049
Naph	0.0001	NA	0.32
EDC	NA	NA	0.15
Lead	NA	NA	ND

MW-2 (mg/L)			
Date	10-10	5-11	9-11
GRO	0.021	ND	ND
DRO	0.166	0.19	0.57
RRO	0.100	ND	0.077
B	0.0028	ND	ND
T	ND	ND	ND
E	ND	ND	ND
X	ND	ND	ND
Naph	0.024	NA	0.0021
EDC	NA	NA	ND
Lead	NA	NA	0.0081

TP-6 (mg/L)		
Date	5-11	9-11
GRO	ND	ND
DRO	0.38	0.24
RRO	ND	0.074
B	ND	ND
T	0.0003	ND
E	ND	ND
X	ND	ND
Naph	0.000015	ND
EDC	NA	ND
Lead	NA	0.00067

TP-5 (mg/L)		
Date	5-11	9-11
GRO	99	140
DRO	9.8	7.2
RRO	0.16	0.21
B	18	21
T	21	18
E	2.3	1.7
X	8.6	6.2
Naph	0.2	1.5
EDC	NA	0.46
EDB	NA	0.0003
Lead	NA	0.039

TP-4 (mg/L)		
Date	5-11	9-11
GRO	ND	ND
DRO	0.037	0.086
RRO	ND	ND
B	ND	ND
T	ND	ND
E	ND	ND
X	ND	ND
Naph	0.000019	0.0011
EDC	NA	0.0029
Lead	NA	NS

TANANA RIVER

TANANA RIVER

RELIC RAILROAD TRACKS

HEADER MANIFOLD

AREA OF PETROLEUM HYDROCARBON IMPACT EXCEEDING ADEC GROUNDWATER CLEANUP LEVEL

FORMER FUEL STORAGE TANK (LOCATION AND SIZE APPROXIMATE)

10.44 in

PARKS HIGHWAY

FRONT STREET

MIDDLE TANK FARM

RELIC RAILROAD TRACKS

TP-3 DESTROYED

EXPLANATION

	TEMPORARY WELL POINT
	MONITORING WELL LOCATION
GRO	GASOLINE-RANGE ORGANICS
DRO	DIESEL-RANGE ORGANICS
RRO	RESIDUAL-RANGE ORGANICS
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
Naph	NAPHTHALENE
EDC	ETHYLENE DICHLORIDE
EDB	ETHYLENE DIBROMIDE
Lead	LEAD
NA	NOT ANALYZED
ND	NOT DETECTED
NS	NOT SAMPLED
mg/L	MILLIGRAMS PER LITER

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

SOURCE: AERIAL PHOTO NENANA6-8-10_3-7.JPG DATED 6/8/10 PROVIDED BY AERO-METRIC

FIGURE 4

GROUNDWATER ANALYTICAL RESULTS

NENANA HEADER AREA AND RAIL LINE SITE
GROUNDWATER MONITORING REPORT – SEPTEMBER 2011
CROWLEY MARITIME CORPORATION
Nenana, Alaska

DATE: DEC. 2011
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ATTACHMENT 2

Tables

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TABLE 1
GROUNDWATER SAMPLE COLLECTION SUMMARY
NENANA HEADER AREA AND RAIL LINE SITE GROUNDWATER MONITORING REPORT - September 2011
CROWLEY MARITIME CORPORATION
NENANA, ALASKA

Well ID	Sample No. (11-NEN-)	Duplicate	MS/MSD	Sample Date	Sample Time	Laboratory Analyses					
						GRO (AK 101)	DRO (AK 102)	RRO (AK 103)	BTEX, MTBE, EDC & Naph (EPA 8260B)	EDB & DBCP (EPA 8011)	Lead (EPA 6020B)
Permanent Groundwater Monitoring Wells											
MW-1	MW1-02-GW			09/27/11	1340	✓	✓	✓	✓	✓	✓
MW-2	MW2-02-GW			09/27/11	1345	✓	✓	✓	✓	✓	✓
MW-3	MW3-02-GW			09/27/11	1530	✓	✓	✓	✓	✓	✓
MW-4	MW4-02-GW			09/27/11	1545	✓	✓	✓	✓	✓	✓
	MW20-02-GW	✓		09/27/11	2200	✓	✓	✓	✓	✓	✓
MW-5	MW5-02-GW			09/28/11	1800	✓	✓	✓	✓	✓	✓
Temporary Pre-Packed Well Points											
TP-1	No sample collected, well dry										
TP-2	TP2-02-GW			09/28/11	1115	✓	✓	✓	✓	✓	✓
TP-3	No sample collected, well destoryed										
TP-4	TP4-02-GW			09/28/11	1715	✓	✓	✓	✓	✓	✓
TP-5	TP5-02-GW			09/28/11	1530	✓	✓	✓	✓	✓	✓
TP-6	TP6-01-GW		✓	09/28/11	1110	✓	✓	✓	✓	✓	✓
Well House											
Well House	MW6-02-GW			09/27/11	1120	✓	✓	✓	✓	✓	✓
Trip Blanks											
--	L539126-07			09/27/11	--	✓			✓		
--	L539126-08			09/27/11	--	✓			✓		
--	L539126-14			09/28/11	--	✓			✓		
--	L539126-15			09/28/11	--	✓			✓		
--	L539126-16			09/28/11	--	✓			✓		

Key:
AK = Alaska
BTEX = Benzene, toluene, ethylbenzene, xylenes
DBCP = Dibromochloropropane
DRO = Diesel-range organics
EDB = Ethylene dibromide
EDC = Ethylene dichloride
EPA = United States Environmental Protection Agency
GRO = Gasoline-range organics
MS/MSD = Matrix spike/matrix duplicate spike
MTBE = Methyl tertiary butyl ether
Naph = Naphthalene
RRO = Residual-range organics

TABLE 2
MONITORING WELL CONSTRUCTION DETAILS AND GROUNDWATER ELEVATIONS
NENANA HEADER AREA AND RAIL LINE SITE GROUNDWATER MONITORING REPORT– September 2011
CROWLEY MARITIME CORPORATION
NENANA, ALASKA

Well ID	Installaton Date	Well Construction Details				Guage Date	Below MP		Groundwater Elevation	Groundwater Elevation within Screening Interval?
		Casing Diameter (inches)	Depth to Top of Screen (bgs)	Depth to Bottom of Screen (bgs)	Measuring Point Elevation[3]		Depth to Product	Depth to Water		
MW-1	10/3/2010	2	3.30	13.30	358.11	9/27/2011	--	10.32	347.79	Yes
MW-2	10/3/2010	2	3.20	13.20	356.83	9/27/2011	--	8.95	347.88	Yes
MW-3	10/3/2010	2	3.20	13.20	357.65	9/27/2011	--	9.85	347.80	Yes
MW-4	10/3/2010	2	3.80	13.80	358.09	9/27/2011	--	10.37	347.72	Yes
MW-5	10/3/2010	2	2.20	10.20	356.40	9/28/2011	--	8.66	347.74	Yes
TP-1	5/23/2011	1	4.50	9.50	359.00	9/27/2011	--	--	--	--
TP-2	5/23/2011	1	8.70	13.70	360.09	9/28/2011	--	12.35	347.74	Yes
TP-3	5/23/2011	1	6.00	11.00	357.87	9/28/2011	--	--	--	--
TP-4	5/23/2011	1	7.80	12.80	356.30	9/28/2011	--	8.25	348.05	Yes
TP-5	5/23/2011	1	7.15	12.15	359.71	9/28/2011	--	11.89	347.82	Yes
TP-6	5/24/2011	1	7.70	12.70	360.06	9/28/2011	--	12.21	347.85	Yes

Notes:

All measurements are in units of feet.

[1] Survey conducted by Design Alaska Inc. on May 26, 2011.

[2] Alaska State Plane Zone 4, NAD83. Coordinates are differentially corrected from an OPUS solution, US Survey feet.

[3] NAVD88. Elevations are based upon COE brass cap monumnet NFPS-1, 1991.

Key:

-- = None measured

bgs = Below ground surface

BTOC = Below top of casing, a.k.a. below measuring point (MP)

DTW = Depth to water

MW = Monitoring well

TP = Temporary sample point (Pre-Packed)

TABLE 3
GROUNDWATER ELEVATION DATA
NENANA HEADER AREA AND RAIL LINE SITE GROUNDWATER MONITORING REPORT– September 2011
CROWLEY MARITIME CORPORATION
NENANA, ALASKA

Well ID	MP Elevation (feet MSL)	Gauge Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Water Elevation (feet MSL)
Permanent Wells					
MW-1	358.11	10/3/2010	--	10.26	347.85
		5/23/2011	--	8.24	349.87
		9/27/2011	--	10.32	347.79
MW-2	356.83	10/3/2010	--	9.00	347.83
		5/23/2011	--	7.30	349.53
		9/27/2011	--	8.95	347.88
MW-3	357.65	10/3/2010	--	9.90	347.75
		5/23/2011	*Frozen*		
		9/27/2011	--	9.85	347.80
MW-4	358.09	10/3/2010	--	10.34	347.75
		5/23/2011	--	8.65	349.44
		9/27/2011	--	10.37	347.72
MW-5	356.40	10/3/2010	--	7.00	349.40
		5/23/2011	--	7.40	349.00
		9/28/2011	--	8.66	347.74
Temporary Well Points					
TP-1	359.00	5/23/2011	*Frozen*		
		9/27/2011	*Dry*		
TP-2	360.09	5/23/2011	--	10.77	349.32
		9/28/2011	--	12.35	347.74
TP-3	357.87	5/23/2011	--	8.00	349.87
		9/28/2011	Destroyed		
TP-4	356.30	5/23/2011	--	6.50	349.80
		9/28/2011	--	8.25	348.05
TP-5	359.71	5/23/2011	--	10.00	349.71
		9/28/2011	--	11.89	347.82
TP-6	360.06	5/24/2011	--	10.43	349.63
		9/28/2011	--	12.21	347.85

Key:
-- = Not present
BTOC = Below top of casing, a.k.a. below
NA = Not available
NM = Not monitored
MP = Measuring point (a.k.a. PVC Elevation/top of casing)
MSL = Mean seal level

TABLE 4
FIELD-COLLECTED GROUNDWATER QUALITY PARAMETERS
NENANA HEADER AREA AND RAIL LINE SITE GROUNDWATER MONITORING REPORT - September 2011
CROWLEY MARITIME CORPORATION
NENANA, ALASKA

Well	Purge/Sample Date	Color	Odor	pH	Temperature (°C)	Conductivity (mS/cm)	DO (mg/L)	ORP (mV)
MW-1	9/27/2011	clear	none noted	6.19	8.47	0.805	0.33	-65.2
MW-2	9/27/2011	clear	none noted	6.47	4.65	0.885	0.30	57.1
MW-3	9/27/2011	clear	medium hydrocarbon	6.81	7.69	0.929	0.42	-106.7
MW-4	9/27/2011	clear	medium hydrocarbon	6.23	9.24	0.874	0.32	-41.5
MW-5	9/28/2011	clear	none noted	6.93	5.39	0.781	0.24	-42.3
TP-1	9/27/2011	*No water*						
TP-2	9/28/2011	amber	none noted	6.67	6.87	0.895	0.48	59.9
TP-3	9/28/2011	*Destoryed*						
TP-4	9/28/2011	clear	medium hydrocarbon	6.52	7.06	0.511	1.24	14.8
TP-5	9/28/2011	grey	medium hydrocarbon	7.15	6.68	1.025	0.65	-155.0
TP-6	9/28/2011	clear	none noted	6.10	6.10	0.928	0.22	-17.8

Key:

°C = Degrees Celsius
DO = Dissolved oxygen
mS/cm =Millisiemens per centimeter
mg/L = Milligrams per liter
mV = Millivolts
MW = Monitoring well
ORP = Oxidation-reduction potential
TP = Temporary well point

TABLE 5
GROUNDWATER ANALYTICAL RESULTS SUMMARY
NENANA HEADER AREA AND RAIL LINE SITE GROUNDWATER MONITORING REPORT - September 2011
CROWLEY MARITIME CORPORATION
NENANA, ALASKA

Location:	ADEC Groundwater Cleanup Levels[1] (mg/L)	MW-1	MW-2	MW-3	MW-4		MW-5	Well House	TP-2	TP-4	TP-5	TP-6
Sample ID (11-NEN-):		MW1-02-GW	MW2-02-GW	MW3-02-GW	MW4-02-GW	MW20-02-GW	MW5-02-GW	MW6-02-GW	TP2-02-GW	TP4-02-GW	TP5-02-GW	TP6-02-GW
Sample Date:		9/27/11	9/27/11	9/27/11	9/27/11	9/27/11	9/28/11	9/27/11	9/28/11	9/28/11	9/28/11	9/28/11
ADEC Fuels (AK101, AK102, AK103; mg/L)												
Gasoline Range Organics	2.2	ND (0.1)	ND (0.1)	0.49	**2.4**	1.4	**8.7**	ND (0.1)	0.36	ND (0.1)	**140**	ND (0.1)
Diesel Range Organics	1.5	0.65J	0.57J	**2.2** J	**20** J	**20** J	0.13J	0.048J	**4.5J**	0.086J	**7.2** J	0.24J
Residual Range Organics	1.1	ND (0.2)	0.077J	0.17J	0.58	0.62	ND (0.2)	ND (0.2)	0.17J	ND (0.2)	0.21	0.074J
Organics (EPA Method 8260B; mg/L)												
Benzene	0.005	0.001	ND (0.001)	**0.058**	**0.011**	**0.010**	**3.5**	ND (0.001)	0.0013	ND (0.001)	**21**	ND (0.001)
Toluene	1.0	ND (0.005)	ND (0.005)	0.0032J	0.0043J	0.0039J	ND (0.005)	ND (0.005)	0.0005J	ND (0.005)	**18**	ND (0.005)
Ethylbenzene	0.7	0.001	ND (0.001)	0.0069	0.0058	0.0053	ND (0.001)	ND (0.001)	0.0044	ND (0.001)	**1.7**	ND (0.001)
Total Xylenes	10	0.0032	ND (0.003)	0.015	0.09	0.084	0.049J	ND (0.003)	0.0093	ND (0.003)	6.2	ND (0.003)
Methyl tert-butyl ether	0.47	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Naphthalene	0.73	0.02	0.0021J	0.0079	0.32	0.3	ND (0.005)	ND (0.005)	0.087	0.0011J	**1.5** J	ND (0.005)
1,2-Dichloroethane (EDC)	0.005	ND (0.001)	ND (0.001)	0.00074J	0.0009J	0.00085J	**0.15**	ND (0.001)	ND (0.001)	ND (0.001)	**0.46** J	ND (0.001)
1,2-Dibromoethane (EDB)	0.00005	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Low-level EDB (EPA Method 8011; mg/L)												
EDB	0.00005	ND (0.00001)	ND (0.00001)	ND (0.00001)	ND (0.00001)	ND (0.00001)	ND (0.00001)	ND (0.00001)	ND (0.00001)	ND (0.00001)	**0.0003**	ND (0.00001)
Lead (EPA Method 6020; mg/L)												
Total Lead	0.015	0.0009J	0.0081J	0.0012	0.0041	0.0039	ND (0.001)	0.0052	0.0018	0.0029	**0.039**	0.00067J

Location:	ADEC Groundwater Cleanup Levels[1] (mg/L)	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample ID (11-NEN-):		L539126-07	L539126-08	L539126-14	L539126-15	L539126-16
Sample Date:		9/27/11	9/27/11	9/28/11	9/28/11	9/28/11
ADEC Fuels (AK101, AK102, AK103; mg/L)						
Gasoline Range Organics	2.2	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Diesel Range Organics	1.5	--	--	--	--	--
Residual Range Organics	1.1	--	--	--	--	--
Organics (EPA Method 8260B; mg/L)						
Benzene	0.005	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Toluene	1.0	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Ethylbenzene	0.7	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Total Xylenes	10	ND (0.003)	ND (0.003)	ND (0.003)	ND (0.003)	ND (0.003)
Methyl tert-butyl ether	0.47	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Naphthalene	0.73	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
1,2-Dichloroethane (EDC)	0.005	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
1,2-Dibromoethane (EDB)	0.00005	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)	ND (0.001)
Low-level EDB (EPA Method 8011; mg/L)						
EDB	0.00005	--	--	--	--	--
Lead (EPA Method 6020; mg/L)						
Total Lead	0.015	--	--	--	--	--

Notes: Results above ADEC cleanup values are **underlined & bolded**.

[1] 18 AAC 75.345, Table C

Key:

-- = Not applicable

ADEC = Alaska Department of Environmental Conservation

AK = Alaska

EDB = ethylene dibromide, a.k.a. 1,2-dibromoethane

EDC = ethylene dichloride, a.k.a. 1,2-dichloroethane (1,2-DCA)

J = Estimated Value

mg/L = Milligrams per liter

ND = Not detected at the associated reported detection limit

TABLE 6
GROUNDWATER CONCENTRATION TRENDS
NENANA HEADER AREA AND RAIL LINE SITE GROUNDWATER MONITORING REPORT - September 2011
CROWLEY MARITIME CORPORATION
NENANA, ALASKA

Well ID	Sample No.	Sample Date	Duplicate	GRO (mg/L)	DRO (mg/L)	RRO (mg/L)	BTEX (mg/L)			
							Benzene	Toluene	Ethylbenzene	Total Xylenes
ADEC Groundwater Cleanup Level [(1)]:				**2.2**	**1.5**	**1.1**	**0.005**	**1**	**0.7**	**10**
MW-1	10-NEN-101-GW	10/4/2010		0.134	0.604	0.119	0.00511	0.00305J	0.00345J	0.01169J
	--	5/27/2011		*Frozen, Not Sampled*						
	11-NEN-MW1-02-GW	9/27/2011		ND (0.1)	0.65J	ND (0.2)	0.001	ND (0.005)	0.001	0.0032
MW-2	10-NEN-102-GW	10/4/2010		0.0208 J	0.166 J	0.0999 J	0.0028	ND (0.0007)	ND (0.0007)	ND (0.0007)
	11-NEN-MW2-01-GW	5/27/2011		ND (0.1)	0.19 J	ND (0.2)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-NEN-MW21-01-GW	5/27/2011	✓	ND (0.1)	0.18 J	ND (0.2)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-NEN-MW2-02-GW	9/27/2011		ND (0.1)	0.57J	ND (0.2)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
MW-3	10-NEN-104-GW	10/4/2010		0.672	1.11	0.259	**0.0927**	0.00644	0.00951	0.02507
	10-NEN-105-GW	10/4/2010	✓	0.770	1.07	0.304	**0.0882**	0.00753	0.0124	0.03104
	--	5/27/2011		*Frozen, Not Sampled*						
	11-NEN-MW3-02-GW	9/24/2011		0.49	**2.2J**	0.17J	**0.058**	0.0032J	0.0069	0.015
MW-4	10-NEN-103-GW	10/4/2010		**2.57**	**7.85**	0.534 J	**0.0545**	0.0319	0.0416	0.566
	11-NEN-MW4-01-GW	5/27/2011		0.5	**42 JS**	0.013 J	0.00035 J	0.019 J	ND (0.001)	0.013 J
	11-NEN-MW4-02-GW	9/27/2011		**2.4**	**20J**	0.58	**0.011**	0.0043J	0.0058	0.09
	11-NEN-MW20-02-GW	9/27/2011	✓	1.4	**20J**	0.62	**0.010**	0.0039J	0.0052	0.084
MW-5	10-NEN-106-GW	10/4/2010		**17.3**	0.108 J	0.0425 J	6.27	0.00807	0.0654	0.35667
	11-NEN-MW5-01-GW	5/27/2011		**11**	0.17	ND (0.2)	**5.2**	0.27 J	0.04	0.23
	11-NEN-MW5-02-GW	9/28/2011		**8.7**	0.13J	ND (0.2)	**3.5**	ND (0.005)	ND (0.001)	0.049J
TP-1	--	5/27/2011		*Frozen, Not Sampled*						
	--	9/28/2011		*No Water, Not Sampled*						
TP-2	11-NEN-TP2-01-GW	5/27/2011		0.5	**2.7**	ND (0.2)	0.0015	0.00063J	0.0056	0.016
	11-NEN-TP2-02-GW	9/28/2011		0.36	**4.5J**	0.17J	0.0013	0.0005J	0.0044	0.0093
TP-3	11-NEN-TP3-01-GW	5/27/2011		ND (0.1)	0.08J	ND (0.2)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	--	9/28/2011		*Well Destoryed, Not Sampled*						
TP-4	11-NEN-TP4-01-GW	5/27/2011		ND (0.1)	0.037J	ND (0.2)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
	11-NEN-TP4-02-GW	9/28/2011		ND (0.1)	0.086J	ND (0.2)	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)
TP-5	11-NEN-TP5-01-GW	5/27/2011		**99**	**9.8**	0.16J	**18**	**21**	**2.3**	8.6
	11-NEN-TP20-01-GW	5/27/2011	✓	**100**	**10**	0.15J	**18**	**21**	**2.4**	9
	11-NEN-TP5-02-GW	9/28/2011		**140**	**7.2J**	0.21	**21**	**18**	**1.7**	6.2
TP-6	11-NEN-TP6-01-GW	5/27/2011		ND (0.1)	0.38J	ND (0.2)	ND (0.001)	0.00034J	ND (0.001)	ND (0.003)
	11-NEN-TP6-02-GW	9/28/2011		ND (0.1)	0.24J	0.074J	ND (0.001)	ND (0.005)	ND (0.001)	ND (0.003)

Notes: Results above ADEC Cleanup Values are underlined & **bold.**
[(1)] 18 AAC 75.345

Key:
-- = Not analyzed/Not applicable
ADEC = Alaska Department of Environmental Conservation
BTEX = benzene, toluene, ethylbenzene, and total xylenes
DRO = Diesel-range organics
GRO = Gasoline range organics
J = Estimated value
mg/L = Milligrams per liter
ND - Not detected above RDL.
RDL = Reported detection limit.
RRO = Residual-range organics

ATTACHMENT 3

Field Forms
Field Notes
Photolog

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Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW-1
Project # : 465-015
Date: 9/27/11
Project Name: Nenana
Start Time: 1215
Site: Header Area
End Time: 1430
Field Team: A. Hansen
Sample ID: 11-NEN-MW1-02-GW Time: 1340 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri.
Total Volume Purged: 0.25 gal

Weather Conditions: 42°F, Sunny, 5-5 mph wind.

Depth to Top of Product (ft BTOC): —
Depth to Oil/Water Interface* (ft BTOC): —
Depth to Water (ft BTOC): 10.32
Total Depth (ft BTOC): 13.25
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
135	1316	9.19	5.82	1.026	715	0.55	-30	Clear	N	10.32	—
"	1319	9.00	5.68	0.949	657	0.39	-22.4	"	"	10.32	—
"	1322	8.61	5.83	0.880	604	0.30	-40.5	"	"	10.32	—
"	1325	8.50	5.92	0.853	584	0.37	-57.5	"	"	10.32	—
"	1328	8.49	6.09	0.822	563	0.39	-53.0	"	"	10.32	—
"	1332	8.47	6.19	0.805	550	0.33	-65.2	"	"	10.32	—

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX/MTBE/EDC	3 40ml VOA	HCl
PRO	3 40 ml VOA	HCl
EDB/DBCP	3- 40ml VOA	NaThio
DRO/RRO	2-1-L HCl	
Lead	500 ml HNO3	

Signed: Ashley Hansen Date: 9/27/11
Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW2
Project # : 465-015
Date: 9/27/11
Project Name: Nenana
Start Time: 1256
Site:
End Time: 1415
Field Team: S. Christiansen
Sample ID: 11-NEN-MW2-02-GW Time: 1345 primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri
Total Volume Purged: 3 gal

Weather Conditions: 50° sunny with light wind

Depth to Top of Product (ft BTOC):
Depth to Oil/Water Interface* (ft BTOC):
Depth to Water (ft BTOC): 8.95
Total Depth (ft BTOC): 13.18
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
360	1322	5.78	6.36	967	596	0.55	42	clear	no	8.95	0
360	1327	4.93	6.41	907	558	0.35	50.9	"	"	8.95	
360	1331	4.89	6.42	885	546	0.25	53.9				
360	1336	4.33	6.43	888	537	0.31	55.5				
340	1339	4.52	6.44	890	~~890~~ 543	0.28	57.4				
340	1342	4.58	6.46	892	545	0.30	57.1				
340	1345	4.65	6.47	885	541	0.30	57.1				

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
		Outer casing filled with bentonite & water. Pumped water out & took bentonite out. Nothing was in the monitoring well

Signed: Sarah Christen Date: 9/27/11
Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW-3
Project # : 465-015
Date: 9/27/11
Project Name: Nenana
Start Time: 1500
Site: Header Area
End Time: 1615
Field Team: A. Hansen
Sample ID: 11-NEN-MW3-02-GW Time: 1530 primary dup split ms/msd
Sample ID: _____ Time: _____ primary dup split ms/msd
Sample ID: _____ Time: _____ primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri
Total Volume Purged: 0.25 gal

Weather Conditions: 43°F, Sunny, 3-5 mph wind

Depth to Top of Product (ft BTOC): —
Depth to Oil/Water Interface* (ft BTOC): —
Depth to Water (ft BTOC): 9.85
Total Depth (ft BTOC): 13.05
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
190	1510	—	—	—	—	—	—	clear	4	9.90	0.05
"	1512	8.22	6.76	0.933	634	0.87	-113.2	"	"	9.90	—
	1515	8.23	6.82	0.931	632	0.86	-102.8	"	"	9.90	—
	1518	7.87	6.79	0.931	627	0.46	-103.4	"	"	"	—
	1521	7.85	6.81	0.926	623	0.43	-107.6	"	"	"	—
	1524	7.69	6.81	0.929	622	0.42	-104.7	"	"		

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
PRO	3 VOA 40ml	HCl
BTEX/MTBE/EDC/EDB	3 VOA 40ml	HCl
EDB/DBCP	3 40ml VOA	NaThiO
Lead	500ml poly	HNO_3

Slight sheen in bucket

Signed: _____ Date: 9/27/11
Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW4
Project # :
Date: 9/27/11
Project Name: Nenana
Start Time: 1500
Site:
End Time: 1645
Field Team: S. Christiansen
Sample ID: 11-NEN-MW4-02-GW Time: 1545 (primary) dup split ms/msd
Sample ID: 11-NEN-MW20-02-GW Time: 2200 primary (dup) split ms/msd
Sample ID: Time: primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri
Total Volume Purged: 2 gal

Weather Conditions: 50 sunny light wind

Depth to Top of Product (ft BTOC): —
Depth to Oil/Water Interface* (ft BTOC): —
Depth to Water (ft BTOC): 10.37
Total Depth (ft BTOC): 13.58
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
300	1516	8.86	6.33	1110	770	.46	-20.3	clear	fuel	11.41	.04
140	1520	9.02	6.31	1014	704	.32	-17.3	"	"	11.41	0
140	1524	9.04	6.28	977	679	.43	-26	"	"	11.41	0
140	1528	9.10	6.27	949	660	.40	-33	"	"	11.41	
140	1531	9.15	6.24	930	648	.43	-37.7				
140	1536	9.22	6.26	906	633	.38	-34.4				
	1539	9.45	6.24	898	630	.44	-34.8			11.41	
	1542	9.46	6.23	890	630	.33	-38.7				
	1545	9.30	6.23	889	622	.34	-38.6				
	1548	9.25	6.24	881	615	.33	-39.8				
	1551	9.24	6.23	874	610	.32	-41.5				

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
GRO	3	
DRO	2	
EDB/DBCP	3	
BTEX	3	
lead	1	

Signed: Sarah Christiansen
Date: 9/27/11
Signed/reviewer
Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: MW-5

Project # : 465-015-1-4 Date: 1655 9/28/11

Project Name: NENA Start Time: 1655

Site: Rail Line End Time: 1810

Field Team: A. Hansen

Sample ID: 11-NEN-MW5-02-GW Time: 1800 (primary) dup split ms/msd

Sample ID: _____ Time: _____ primary dup split ms/msd

Sample ID: _____ Time: _____ primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri.

Total Volume Purged: _____

Weather Conditions: 42°F, overcast 3-5 mph

Depth to Top of Product (ft BTOC): — Depth to Water (ft BTOC): 8.66

Depth to Oil/Water Interface* (ft BTOC): — Total Depth (ft BTOC): 12.30

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
275	1712	5.76	6.91	0.844	533	0.54	-38.1	Clear	N	8.70	0.04
	1715	5.78	6.89	0.828	524	0.47	-38.9	"	"	8.70	—
	1718	5.61	6.90	0.812	511	0.34	-40.2	"	"	8.70	—
	1721	5.49	6.90	0.801	503	0.30	-38.7	"	"	8.70	—
	1724	5.25	6.87	0.843	526	0.82	-37.2	"	"	8.70	—
	1727	5.33	6.90	0.809	505	0.26	-45.4	"	"	8.70	—
	1730	5.59	6.92	0.795	497	0.23	-43.8	"	"	8.70	—
	1733	5.39	6.93	0.781	488	0.24	-42.3	"	"	8.70	—

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
8260	3 40 ml VOA	HCl
DRO/GRO	2 1L Amber	HCl
Lead	1 250ml Poly	HNO3
BTEX/MTBE/GRO	3 40 ml VOA	HCl
EDB/DBCP	3 40 ml VOA	NaThio

Signed: _____ Date: 9/28/11

Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: TP1

Project # : Nenana 465-015 — Date: 9/27/11

Project Name: Nenana — Start Time: 1230

Site: — End Time: 1245

Field Team: S. Christiansen

Sample ID: 11-NEN-TP1-02-GW Time: ____ (primary) dup split ms/msd

Sample ID: ____ Time: ____ primary dup split ms/msd

Sample ID: ____ Time: ____ primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri

Total Volume Purged: 0

Weather Conditions: ____

Depth to Top of Product (ft BTOC): ____ — Depth to Water (ft BTOC): ____

Depth to Oil/Water Interface* (ft BTOC): ____ — Total Depth (ft BTOC): 10.0

* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
		no water to sample

Signed: Sarah Christiansen — Date: 9/27/11

Signed/reviewer — Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: TP2
Project # :
Date: 9/28/11
Project Name: Nenana
Start Time: 1015
Site:
End Time: 1200
Field Team: S. Christiansen
Sample ID: 11-NEN-TP2-02-GW Time: 1115 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): peri
Total Volume Purged: 1.5 gallons

Weather Conditions: 45° cloudy

Depth to Top of Product (ft BTOC):
Depth to Oil/Water Interface* (ft BTOC):
Depth to Water (ft BTOC): 12.35
Total Depth (ft BTOC): 15
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
90	1024	7.30	6.62	1.025	678	.80	-50.8	yellow	no		
100	1029	7.15	6.64	1.002	661	.49	-55.8				
100	1034	7.11	6.64	.959	634	.34	-52.4				
110	1039	7.11	6.65	.944	622	.28	-52.9				
	1043	7.09	6.67	.931	612	.30	-53.2				
100	1047	6.99	6.67	.909	597	.31	-57.5				
	1050	6.97	6.68	.891	584	.30	-57.6				
110	1053	6.87	6.67	.896	585	.48	59.9				

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected
BTEX	3
GRO	3
EDB/DBCP	3
DRO	2
Lead	1

Comments: Was not able to take water measurements while sampling because they both would not fit.

Signed: Sarah Christiansen Date: 9/28/11
Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: TP4
Project #: 465-015-1-4
Date: 9/28/11
Project Name: Nenana
Start Time: 1630
Site:
End Time: 1745
Field Team: S. Clark Hansen
Sample ID: 11-NEN-TP4-02-GW Time: 1715 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri
Total Volume Purged: 2 gal

Weather Conditions: 50° sunny/cloudy

Depth to Top of Product (ft BTOC):
Depth to Oil/Water Interface* (ft BTOC):
Depth to Water (ft BTOC): 8.25
Total Depth (ft BTOC): 12.93
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
140	1642	7.44	6.52	.513	341	[illegible]	-1.3				
	1645	7.33	6.57	.512	339	1.65	0.4				
	1649	7.29	6.56	.511	338	1.58	14.5				
	1653	7.14	6.54	.572	337	1.42	16.3				
	1657	7.09	6.54	.511	336	1.34	21.5				
	1701	7.10	6.53	.570	336	1.26	16.2				
	1704	7.09	6.53	.570	336	1.28	17.0				
	1708	7.06	6.52	.511	336	1.24	14.8				

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
GRO	3	great recharge
BTEX	3	
EDB	3	
DRO	2	
lead	1	

Signed: Sarah Clark Date: 9/28/11
Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: TP5
Project # :
Date: 9/28/11
Project Name: Nenana
Start Time: 1500
Site:
End Time: 1600
Field Team: S. Christiansen
Sample ID: 11-NEN-TP5-02-GW Time: 1530 (primary) dup split ms/msd
Sample ID: Time: primary dup split ms/msd
Sample ID: Time: primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): per
Total Volume Purged: 2 gal

Weather Conditions: 50° sunny / cloudy

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): 11.89
Total Depth (ft BTOC): 14.94

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C	pH	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm)	DO (mg/L)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
	1503	7.44	7.21	1.003	666.7	.46	-56.5	grey	fuel		
180	1507	7.04	7.07	1.019	669	.23	-140				
140	1511	6.87	7.15	1.028	671	.58	-146.3				
140	1515	6.71	7.18	1.024	666	.69	-152.1				
140	1518	6.63	7.18	1.025	665	.66	-154.7				
130	1521	6.65	7.17	1.024	665	.66	-154.3				
	1525	6.68	7.15	1.025	666	.65	-155				

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:

Signed: Sarah Christiansen Date: 9/28/11
Signed/reviewer Date:

Low-Flow Groundwater Sampling with Minimal Drawdown Worksheet

Well ID: TP-6
Project # : 465-015-114
Date: 9/28/11
Project Name: Nenana
Start Time: 1010
Site: Header Area
End Time: 1255
Field Team: A. Hansen
Sample ID: 11-NEN-TP6-02-GW Time: 1110 primary dup split (ms/msd)
Sample ID: _____ Time: _____ primary dup split ms/msd
Sample ID: _____ Time: _____ primary dup split ms/msd

Purging and Sampling Method (e.g. peristaltic, bladder, submersible): Peri
Total Volume Purged: ~~3.5 gal~~ 2 gal

Weather Conditions: 30°F, overcast, 0-3 mph

Depth to Top of Product (ft BTOC): —
Depth to Oil/Water Interface* (ft BTOC): —
Depth to Water (ft BTOC): 12.21
Total Depth (ft BTOC): 15.00
* Note: Same as depth to water

Criteria for Stable Parameters

Parameter	Working Range	Stability Criteria	Notes
Temperature	>0.00 °C	± 0.2° C	
pH	0-14	± 0.1	
Conductivity	0-999 mS/m	± 3%	
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

Flowrate (ml/min)	Time	Temp °C (0.2)	pH (0.1)	Conduct'ity (Ms/cm)	Conduct'ity (µs/cm) (±3%)	DO (mg/L) (10%)	ORP (mV)	Color	Odor	Water Level (ft BTOC)	Draw-down
180	1034	6.64	5.91	0.953	618	0.48	-35.5	Hbbm	N	—	—
	1037	6.52	4.95	0.943	610	0.47	18.3	clear	N	—	—
	1040	6.47	4.92	0.935	604	0.37	21.5	"	"	—	—
	1043	6.39	5.10	0.931	600	0.30	14.0	"	"	—	—
	1046	6.33	5.25	0.930	599	0.26	5.8	"	"	—	—
	1049	6.21	5.49	0.931	596	0.20	-5.0	"	"	—	—
	1052	6.16	5.59	0.930	595	0.32	-6.3	"	"	—	—
	1055	6.19	5.74	0.929	595	0.28	-9.7	"	"	—	—
	1058	6.14	5.86	0.929	594	0.28	-12.0	"	"	—	—
	1101	6.14	5.95	0.929	594	0.25	-8.1	"	"	—	—
	1104	6.16	6.01	0.928	594	0.25	-12.0	"	"	—	—
	1107	6.10	6.10	0.928	594	0.22	-13.8	"	"	—	—

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 hydrogeology may make it difficult to achieve this specification.

Analyses	# of Bottles Collected	Comments:
BTEX/MTBE/	9-VOA HCl	Could not measure drawdown while purging due to the water level meter +
EDC/EDB		
PAH	9-VOA HCl	Pump tubing not fitting down small diameter
GDR/DRCP	9-VOA HCl	well @ the same time.
DRO/RRO	6-Liter HCl	

Lead 3-500 ml poly HNO3

Signed: _____ Date: 9/28/11

Signed/reviewer Date:

Header Area + Rail Line Area Site
Nenana, Alaska

Rite in the Rain®
ALL-WEATHER
FIELD
№ 353N

Additional Site Characterization

465-015

9/27/11 Rail lime site S Christiansen
4165-015-1-4

0700 Departed ~~AAC~~ for FAI
0820 Arrived ~~ANC~~ (Arr 9/27/11) FAI, picked up rental car & gear.
0930 Departed for Nenana.
1030 Arrived in Nenana, called Endil, no answer left message, conducted tailgate safety meeting.
1040 Talked to Crowley personnel, stated only one well onsite. The temporary camps haul water from the city + store in big bulk tanks.
1120 Sampled well House well
11-NEN-MW6-02-GW
BTEX / ~~MTBE~~ MTBE / ~~MBTE~~ / EBB / EDC ~~+NAPH~~ NAPH
Low-Level EBD / DBCP
GRO
DRO/RRO
Lead
1150 Ran into Keith Horton from Crowley. Said sink + spicket are

Ashley Hon 9/27/11

1/3

Connected to the same well. Do not use for drinking.

1215 A.Hansen setup on mw-1

1230 S.Christiansen setup on TP-1, no H2O. well is dry cannot be sampled.

1235 S.christiansen setup on mw-2

1340 A.Hansen sampled mw-1 11-NEN-MW1-02-GW see data sheet

1345 S.christiansen sampled mw-2 11-NEN-MW2-02-GW see data sheet.

1500 A.Hansen setup on mw-3 + S.christiansen setup on mw-4.

1530. A.Hansen collected sample @ MW-3 11-NEN-MW3-02-GW - See data sheet

1545 S.christiansen sampled mw-4 - ~~MW~~ 11-NEN-MW4-02-GW + Duplicate sample 11-NEN-20-02-GW @ 2200 (see data sheet)

AHuntsman 9/27/11

1645 finished sampling for the day. Put purge H2O through GAC ~ 5.25 gal. Purchased ice

1730 Arrived back @ Rough-woods, prepped coolers for shipment

1800 Done for the day.

AHuntsman 9/27/11

3/3

9/28/11 465-015-1-4 S.Christiansen

27°F, overcast, 0-3mph

0800 Calibrated YSI's rented from TTT

Serial # 04612880

STD	Initial	Final	OOR?
pH 7.0	7.00	7.00	N
pH 4.0	4.05	4.00	N
pH 10.0	10.10	10.02	N
Cond. 1.413 mS/cm	1.375	1.413	N
ORP 240mV	229.1	240	N
100% DO	91.2	98.8	N

Serial # 11H100451

STD	Initial	Final	OOR?
pH 7.0	6.98	7.00	N
pH 4.0	4.05	4.00	N
pH 10.0	10.13	10.02	N
Cond 1.413 mS/cm	1.348	1.413	N
ORP 240 mV	295.1	240.0	N
100% DO	89.6	98.8	

0900 Paid for Foom

0930 Arrived onsite, conducted tailgate safety meeting

0940 Checked out TP-3. Field has been mowed, could not see TP-3 from road. ~~TP~~ After

A Hansen 9/28/11 1/4

9/28/11 465-015-1-4 S. Christiansen

Further inspection, TP-3 has been destroyed (see photo). did not sample.

1000 S Christiansen setup on TP-2.

1010 A. Hansen setup on TP-6

1110 A. Hansen sampled TP-6 11-NEN-TP6-02-GW MS/MSD

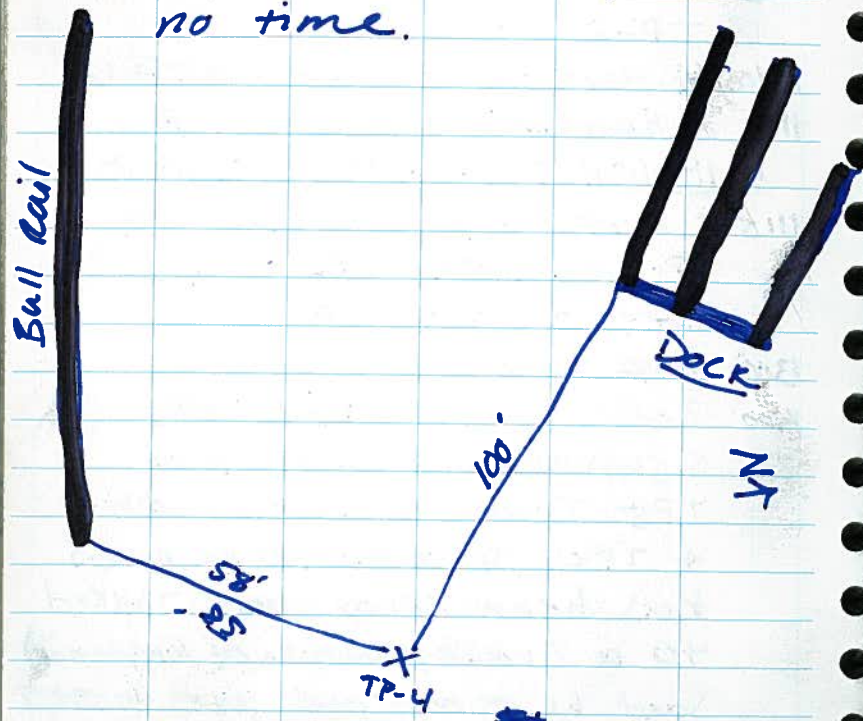
1115 S. Christiansen sampled TP-2 11-NEN-TP2-02-GW (see data sheet)

1300 TOOK lunch

1400 Returned to site. S. Christiansen set up on TP5. Tried to locate MW-5 + TP4. Gravel pile by MW-5 has been spread out. Talked to a Crowley worker (long hair) Said he spread out pile first, made sure not to cover well. Said someone else move gravel around after him + covered well. He was not happy. Gave # to City

A Hansen 9/28/11 2/4

to borrow metal detector Roger 978-9177. Searched for a bit w/no luck. Tried ~~1130~~ 1155 TP4. Found TP4 in no time.



~~1650~~ ~~Found mw-5. Put barrier over well.~~

~~1655~~ ~~1730~~ 1530 S. Christiansen sampled TP-5 11-NEN-TP5-02-GW

9/28/11 3/4

see data sheet.

1630 S. Christiansen setup on TP4

1650 A. Hansen found mw-5

1655 A. Hansen setup on mw-5

1715 S. Christiansen sampled TP4 11-NEN-TP4-02-GW see data sheet

1800 A. Hansen ~~setup~~ sampled mw-5 11-NEN-mw5-02-GW see data sheet. placed barrier + Lathe around mw-5

1830 collected all sample gear, disposed of all PPE + waste in Crowley dumpster. discharged 5.5 gallons of purge H2O through GAC.

1900 Purchased ice for samples.

1915 Dinner break

1940 Began prepping coolers for shipment, filled out COCs

2030 Done for the day

9/28/11 4/4

PHOTOGRAPH 1: VIEW FORM LEFT TO RIGHT, LARGE PLASTIC WATER STORAGE BIN, CONNEX WHERE WATER BIN IS STORED, TEMPORARY CAMP, LOOKING NORTHWEST (SEPT 2011)

PHOTOGRAPH 2: VIEW INSIDE WATER BIN STORAGE CONNEX (SEPT 2011)

PHOTOGRAPH 3: VIEW OF THE "WELL HOUE" AND OUTSIDE SPIGOT (RIGHT SIDE OF PHOTO), LOOKING NORTH (SEPT 2011)

PHOTOGRAPH 4: VIEW OF SINK INSIDE "WELL HOUSE" (SEPT 2011)

PHOTOGRAPH 5: VIEW OF WATER AND BENTONITE INSIDE THE MONUMENT OF MW-2 (SEPT 2011)

PHOTOGRAPH 6: VIEW OF TP-3 DESTORYED BY MOWER (SEPT 2011)

PHOTOGRAPH 7: VIEW OF PREVIOUS GRAVEL STOCKPILE LOCATION AND MW-5, LOOKING NORTH (SEPT 2011)

PHOTOGRAPH 8: VIEW OF GRAVEL STOCKPILE LOCATION AND MW-5, LOOKING NORTH (SEPT 2010)

ATTACHMENT 4

Analytical Results
QAR
ADEC Checklist

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ESC LABORATORY SCIENCES
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Est. 1970

Quality Control Summary
SDG: L539126

For: OASIS Environmental - Anchorage, AK
Project: Nenana
October 13, 2011

Sample Receiving and Handling

All sample aliquots were received at the correct temperature, in the proper containers, and with the appropriate preservatives. All method specified holding times were met.

Trace Metals by Method 6020

Laboratory Control Sample

Samples L539126-04, -10, -01, -03, -05, -06, -02, and -09 were analyzed in analytical batch WG558953. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Samples L539126-11, -12, and -13 were analyzed in analytical batch WG559101. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Sample Duplicate Analysis

For analytical batch WG558953 sample duplicate analysis was performed on sample L539126-09. The relative percent difference exceeded the method limits for Lead.

For analytical batch WG559101 sample duplicate analysis was performed on sample L539282-06. The relative percent differences were within the method limits.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG558953 matrix spike/matrix spike duplicate analysis was performed on sample L539126-09. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

For analytical batch WG559101 matrix spike/matrix spike duplicate analysis was performed on sample L539282-06. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

Blank Analysis

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Method AK101

Laboratory Control Sample

Samples L539126-09, -05, -06, -10, -15, -03, -12, -02, -08, -07, -13, -14, -11, -16, -04, and -01 were analyzed in analytical batch WG558366. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG558366 matrix spike/matrix spike duplicate analysis was performed on sample L539096-20. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

For analytical batch WG558366 matrix spike/matrix spike duplicate analysis was performed on sample L539126-09. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

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Est. 1970

Quality Control Summary
SDG: L539126
For: OASIS Environmental - Anchorage, AK
Project: Nenana
October 13, 2011

Blank Analysis
The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Volatile Organic Compounds by Method 8260B
Laboratory Control Sample
Samples L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, and -12 were analyzed in analytical batch WG558436. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Samples L539126-05, -10, and -06 were analyzed in analytical batch WG558845. The laboratory control sample associated with these samples was within the laboratory control limits for all compounds.

Matrix Spike/Matrix Spike Duplicate
For analytical batch WG558436 matrix spike/matrix spike duplicate analysis was performed on sample L539126-09. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

For analytical batch WG558845 matrix spike/matrix spike duplicate analysis was performed on sample L539407-02. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes.

Blank Analysis
The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Method 504/8011
Laboratory Control Sample
Samples L539126-02, -05, -03, -04, and -01 were analyzed in analytical batch WG558585. The laboratory control sample associated with these samples had all target compounds within method limits on column one. On column two, Ethylene Dibromide and 1,2-Dibromo-3-Chloropropane were below laboratory control limits.

Samples L539126-12, -06, -09, -11, -10, and -13 were analyzed in analytical batch WG558955. The laboratory control sample associated with these samples had all target compounds within method limits on column one. On column two, 1,2-Dibromo-3-Chloropropane was below laboratory control limits.

Matrix Spike
For analytical batch WG558585 matrix spike analysis was performed on sample L539022-03. The matrix spike recoveries were below laboratory control limits for Ethylene Dibromide and 1,2-Dibromo-3-Chloropropane on column two. The spike recoveries for the remaining target compounds were within limits.

For analytical batch WG558955 matrix spike analysis was performed on sample L539126-09. The matrix spike recoveries were above laboratory control limits for Ethylene Dibromide on column one. The matrix spike recovery was below laboratory control limits for 1,2-Dibromo-3-Chloropropane on column two. The spike recoveries for the remaining target compounds were within limits.

Blank Analysis
The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

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Quality Control Summary
SDG: L539126
For: OASIS Environmental - Anchorage, AK
Project: Nenana
October 13, 2011

AK102 / AK103

Laboratory Control Sample

Samples L539126-02, -04, -05, -10, -12, -13, -01, -03, -06, -09, and -11 were analyzed in analytical batch WG558681. The laboratory control sample associated with these samples was below method control limits.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG558681, matrix spike/matrix spike duplicate analysis was performed on sample L539126-09. The spike recoveries were below the laboratory control limits. The relative percent difference was within control limits.

Blank Analysis

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

Nancy F. Winters
ESC Representative
ESC Lab Sciences

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Tax I.D. 62-0814289

Est. 1970

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

Report Summary

Wednesday October 12, 2011

Report Number: L539126
Samples Received: 09/30/11
Client Project: 465-015-1-4

Description: Nenana

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - I-2327, CT - PH-0197, FL - E87487
GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704, ND - R-140
NJ - TN002,NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 00109, WV - 233
AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032008A,
TX - T104704245, OK-9915, PA - 68-02979

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-01

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-MW6-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 11:20

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	5.2	0.24	1.0	ug/l		6020	10/09/11	1
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	109.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/04/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/04/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	104.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	103.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	107.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	103.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	48.	22.	800	ug/l	JJ4	AK102/1	10/06/11	1
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	77.4			% Rec.		AK102/1	10/06/11	1
n-Triacontane d62	82.1			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/04/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/04/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44
L539126-01 (AK102/103) - per e-mail & TSR add J4

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-02

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-MW1-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 13:40

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	0.90	0.24	1.0	ug/l	J	6020	10/09/11	1
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	1.0	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/04/11	1
Ethylbenzene	1.0	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	3.2	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	20.	0.69	5.0	ug/l		8260B	10/04/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	104.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	105.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	650	22.	800	ug/l	JJ4	AK102/1	10/06/11	1
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	71.7			% Rec.		AK102/1	10/06/11	1
n-Triacontane d62	71.6			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/04/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/04/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44
L539126-02 (AK102/103) - per e-mail & TSR add J4

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-03

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-MW2-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 13:45

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	0.81	0.24	1.0	ug/l	J	6020	10/05/11	1
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/04/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	2.1	0.69	5.0	ug/l	J	8260B	10/04/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	104.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	104.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	570	22.	800	ug/l	JJ4	AK102/1	10/06/11	1
AK103 RRO C25-C36	77.	66.	200	ug/l	J	AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	68.5			% Rec.		AK102/1	10/06/11	1
n-Triacontane d62	81.0			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/04/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/04/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44
L539126-03 (AK102/103) - per e-mail & TSR add J4

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-04

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-MW3-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 15:30

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	1.2	0.24	1.0	ug/l		6020	10/05/11	1
TPHGAK C6 to C10	490	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	104.			% Rec.		AK101	10/01/11	1
Benzene	58.	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	3.2	0.16	5.0	ug/l	J	8260B	10/04/11	1
Ethylbenzene	6.9	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	15.	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	7.9	0.69	5.0	ug/l		8260B	10/04/11	1
1,2-Dichloroethane	0.74	0.26	1.0	ug/l	J	8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	105.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	108.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	2200	22.	800	ug/l	J4	AK102/1	10/07/11	1
AK103 RRO C25-C36	170	66.	200	ug/l	J	AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	63.7			% Rec.		AK102/1	10/07/11	1
n-Triacontane d62	71.4			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/04/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/04/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44
L539126-04 (AK102/103) - per e-mail & TSR add J4

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Est. 1970

REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-05

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-MW4-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 15:45

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	4.1	0.24	1.0	ug/l		6020	10/05/11	1
TPHGAK C6 to C10	2400	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	115.			% Rec.		AK101	10/01/11	1
Benzene	11.	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	4.3	0.16	5.0	ug/l	J	8260B	10/04/11	1
Ethylbenzene	5.8	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	90.	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	320	6.9	50.	ug/l		8260B	10/04/11	10
1,2-Dichloroethane	0.90	0.26	1.0	ug/l	J	8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	103.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	101.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	114.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	20000	450	16000	ug/l	J4	AK102/1	10/07/11	20
AK103 RRO C25-C36	580	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	0.00			% Rec.	J7	AK102/1	10/07/11	20
n-Triacontane d62	56.4			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/04/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/04/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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L539126-05 (AK102/103) - per e-mail & TSR add J4

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-06

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-20-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 22:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	3.9	0.24	1.0	ug/l		6020	10/05/11	1
TPHGAK C6 to C10	1400	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	113.			% Rec.		AK101	10/01/11	1
Benzene	10.	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	3.9	0.16	5.0	ug/l	J	8260B	10/04/11	1
Ethylbenzene	5.3	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	84.	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	300	6.9	50.	ug/l		8260B	10/04/11	10
1,2-Dichloroethane	0.85	0.26	1.0	ug/l	J	8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	102.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	103.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	110.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	20000	450	16000	ug/l	J4	AK102/1	10/07/11	20
AK103 RRO C25-C36	620	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	0.00			% Rec.	J7	AK102/1	10/07/11	20
n-Triacontane d62	67.1			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/05/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/05/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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L539126-06 (AK102/103) - per e-mail & TSR add J4

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-07

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : TRIP BLANK

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 18:30

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/03/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/03/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/03/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/03/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/03/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/03/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/03/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/03/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/03/11	1
Dibromofluoromethane	103.			% Rec.		8260B	10/03/11	1
a,a,a-Trifluorotoluene	106.			% Rec.		8260B	10/03/11	1
4-Bromofluorobenzene	104.			% Rec.		8260B	10/03/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44

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REPORT OF ANALYSIS

Dan Frank
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825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-08

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : TRIP BLANK

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/27/11 18:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/03/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/03/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/03/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/03/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/03/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/03/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/03/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/03/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/03/11	1
Dibromofluoromethane	104.			% Rec.		8260B	10/03/11	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	10/03/11	1
4-Bromofluorobenzene	104.			% Rec.		8260B	10/03/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
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October 12, 2011

ESC Sample # : L539126-09

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-TP6-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 11:10

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	0.67	0.24	1.0	ug/l	JP1	6020	10/05/11	1
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/03/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/03/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/03/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/03/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/03/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/03/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/03/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/03/11	1
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	10/03/11	1
Dibromofluoromethane	106.			% Rec.		8260B	10/03/11	1
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	10/03/11	1
4-Bromofluorobenzene	103.			% Rec.		8260B	10/03/11	1
AK102 DRO C10-C25	240	22.	800	ug/l	JJ4J6	AK102/1	10/06/11	1
AK103 RRO C25-C36	74.	66.	200	ug/l	J	AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	75.0			% Rec.		AK102/1	10/06/11	1
n-Triacontane d62	86.5			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/05/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/05/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44
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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
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October 12, 2011

ESC Sample # : L539126-10

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-TP2-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 11:15

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	1.8	0.24	1.0	ug/l		6020	10/05/11	1
TPHGAK C6 to C10	360	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	111.			% Rec.		AK101	10/01/11	1
Benzene	1.3	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	0.50	0.16	5.0	ug/l	J	8260B	10/04/11	1
Ethylbenzene	4.4	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	9.3	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	87.	0.69	5.0	ug/l		8260B	10/04/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	100.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	103.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	106.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	4500	22.	800	ug/l	J4	AK102/1	10/07/11	1
AK103 RRO C25-C36	170	66.	200	ug/l	J	AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	67.1			% Rec.		AK102/1	10/07/11	1
n-Triacontane d62	75.4			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/05/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/05/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-11

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-TP5-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 15:30

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	39.	0.24	1.0	ug/l		6020	10/07/11	1
TPHGAK C6 to C10	140000	4100	10000	ug/l		AK101	10/01/11	100
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	105.			% Rec.		AK101	10/01/11	100
Benzene	21000	89.	500	ug/l		8260B	10/04/11	500
Toluene	18000	82.	2500	ug/l		8260B	10/04/11	500
Ethylbenzene	1700	140	500	ug/l		8260B	10/04/11	500
Total Xylenes	6200	430	1500	ug/l		8260B	10/04/11	500
Methyl tert-butyl ether	U	130	500	ug/l		8260B	10/04/11	500
Naphthalene	1500	350	2500	ug/l	J	8260B	10/04/11	500
1,2-Dichloroethane	460	130	500	ug/l	J	8260B	10/04/11	500
1,2-Dibromoethane	U	220	500	ug/l		8260B	10/04/11	500
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/04/11	500
Dibromofluoromethane	103.			% Rec.		8260B	10/04/11	500
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	10/04/11	500
4-Bromofluorobenzene	107.			% Rec.		8260B	10/04/11	500
AK102 DRO C10-C25	7200	22.	800	ug/l	J4	AK102/1	10/07/11	1
AK103 RRO C25-C36	210	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	73.9			% Rec.		AK102/1	10/07/11	1
n-Triacontane d62	72.5			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	0.30	0.0037	0.010	ug/l		8011	10/05/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/05/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-12

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-TP4-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 17:15

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	2.9	0.24	1.0	ug/l		6020	10/07/11	1
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/02/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	109.			% Rec.		AK101	10/02/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/04/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/04/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/04/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/04/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/04/11	1
Naphthalene	1.1	0.69	5.0	ug/l	J	8260B	10/04/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/04/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/04/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/04/11	1
Dibromofluoromethane	101.			% Rec.		8260B	10/04/11	1
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	10/04/11	1
4-Bromofluorobenzene	106.			% Rec.		8260B	10/04/11	1
AK102 DRO C10-C25	86.	22.	800	ug/l	JJ4	AK102/1	10/07/11	1
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	77.3			% Rec.		AK102/1	10/07/11	1
n-Triacontane d62	73.9			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/05/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/05/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-13

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : 11-NEN-MW5-02-GW

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 18:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
Lead	U	0.24	1.0	ug/l		6020	10/07/11	1
TPHGAK C6 to C10	8700	200	500	ug/l		AK101	10/02/11	5
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	98.0			% Rec.		AK101	10/02/11	5
Benzene	3500	8.9	50.	ug/l		8260B	10/04/11	50
Toluene	U	8.2	250	ug/l		8260B	10/04/11	50
Ethylbenzene	U	14.	50.	ug/l		8260B	10/04/11	50
Total Xylenes	49.	43.	150	ug/l	J	8260B	10/04/11	50
Methyl tert-butyl ether	U	13.	50.	ug/l		8260B	10/04/11	50
Naphthalene	U	35.	250	ug/l		8260B	10/04/11	50
1,2-Dichloroethane	150	13.	50.	ug/l		8260B	10/04/11	50
1,2-Dibromoethane	U	22.	50.	ug/l		8260B	10/04/11	50
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/04/11	50
Dibromofluoromethane	105.			% Rec.		8260B	10/04/11	50
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	10/04/11	50
4-Bromofluorobenzene	104.			% Rec.		8260B	10/04/11	50
AK102 DRO C10-C25	130	22.	800	ug/l	JJ4	AK102/1	10/07/11	1
AK103 RRO C25-C36	U	66.	200	ug/l		AK102/1	10/04/11	1
Surrogate Recovery								
o-Terphenyl	75.3			% Rec.		AK102/1	10/07/11	1
n-Triacontane d62	69.3			% Rec.		AK102/1	10/04/11	1
Ethylene Dibromide	U	0.0037	0.010	ug/l		8011	10/05/11	1
1,2-Dibromo-3-Chloropropane	U	0.0030	0.020	ug/l		8011	10/05/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44
L539126-13 (AK102/103) - per e-mail & TSR add J4

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Est. 1970

REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-14

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : TRIP BLANK

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 20:30

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/03/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/03/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/03/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/03/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/03/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/03/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/03/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/03/11	1
Surrogate Recovery								
Toluene-d8	102.			% Rec.		8260B	10/03/11	1
Dibromofluoromethane	102.			% Rec.		8260B	10/03/11	1
a,a,a-Trifluorotoluene	105.			% Rec.		8260B	10/03/11	1
4-Bromofluorobenzene	103.			% Rec.		8260B	10/03/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-15

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : TRIP BLANK

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 20:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/03/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/03/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/03/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/03/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/03/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/03/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/03/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/03/11	1
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	10/03/11	1
Dibromofluoromethane	105.			% Rec.		8260B	10/03/11	1
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	10/03/11	1
4-Bromofluorobenzene	104.			% Rec.		8260B	10/03/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44

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REPORT OF ANALYSIS

Dan Frank
OASIS Environmental - Anchorage, AK
825 W. 8th Ave.
Anchorage, AK 99501

October 12, 2011

ESC Sample # : L539126-16

Date Received : September 30, 2011
Description : Nenana

Site ID :

Sample ID : TRIP BLANK

Project # : 465-015-1-4

Collected By : AH/SC
Collection Date : 09/28/11 21:00

Parameter	Result	MDL	RDL	Units	Qualifier	Method	Date	Dil.
TPHGAK C6 to C10	U	41.	100	ug/l		AK101	10/01/11	1
Surrogate Recovery-%								
a,a,a-Trifluorotoluene(FID)	108.			% Rec.		AK101	10/01/11	1
Benzene	U	0.18	1.0	ug/l		8260B	10/03/11	1
Toluene	U	0.16	5.0	ug/l		8260B	10/03/11	1
Ethylbenzene	U	0.27	1.0	ug/l		8260B	10/03/11	1
Total Xylenes	U	0.86	3.0	ug/l		8260B	10/03/11	1
Methyl tert-butyl ether	U	0.27	1.0	ug/l		8260B	10/03/11	1
Naphthalene	U	0.69	5.0	ug/l		8260B	10/03/11	1
1,2-Dichloroethane	U	0.26	1.0	ug/l		8260B	10/03/11	1
1,2-Dibromoethane	U	0.44	1.0	ug/l		8260B	10/03/11	1
Surrogate Recovery								
Toluene-d8	101.			% Rec.		8260B	10/03/11	1
Dibromofluoromethane	105.			% Rec.		8260B	10/03/11	1
a,a,a-Trifluorotoluene	104.			% Rec.		8260B	10/03/11	1
4-Bromofluorobenzene	101.			% Rec.		8260B	10/03/11	1

U = ND (Not Detected)
RDL = Reported Detection Limit = LOQ = PQL = EQL
MDL = Minimum Detection Limit = LOD = SQL(TRRP)
Note:
The reported analytical results relate only to the sample submitted.

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Reported: 10/11/11 09:10 Revised: 10/12/11 16:44

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L539126-01	WG558681	SAMP	AK102 DRO C10-C25	R1884992	JJ4
L539126-02	WG558953	SAMP	Lead	R1888212	J
	WG558681	SAMP	AK102 DRO C10-C25	R1884992	JJ4
L539126-03	WG558953	SAMP	Lead	R1888212	J
	WG558681	SAMP	AK102 DRO C10-C25	R1884992	JJ4
	WG558681	SAMP	AK103 RRO C25-C36	R1884992	J
	WG558436	SAMP	Naphthalene	R1883273	J
L539126-04	WG558681	SAMP	AK102 DRO C10-C25	R1884992	J4
	WG558681	SAMP	AK103 RRO C25-C36	R1884992	J
	WG558436	SAMP	Toluene	R1883273	J
	WG558436	SAMP	1,2-Dichloroethane	R1883273	J
L539126-05	WG558681	SAMP	AK102 DRO C10-C25	R1884992	J4
	WG558681	SAMP	o-Terphenyl	R1884992	J7
	WG558436	SAMP	Toluene	R1883273	J
	WG558436	SAMP	1,2-Dichloroethane	R1883273	J
L539126-06	WG558681	SAMP	AK102 DRO C10-C25	R1884992	J4
	WG558681	SAMP	o-Terphenyl	R1884992	J7
	WG558436	SAMP	Toluene	R1883273	J
	WG558436	SAMP	1,2-Dichloroethane	R1883273	J
L539126-09	WG558953	SAMP	Lead	R1888212	JP1
	WG558681	SAMP	AK102 DRO C10-C25	R1884992	JJ4J6
	WG558681	SAMP	AK103 RRO C25-C36	R1884992	J
L539126-10	WG558681	SAMP	AK102 DRO C10-C25	R1884992	J4
	WG558681	SAMP	AK103 RRO C25-C36	R1884992	J
	WG558436	SAMP	Toluene	R1883273	J
L539126-11	WG558681	SAMP	AK102 DRO C10-C25	R1884992	J4
	WG558436	SAMP	Naphthalene	R1883273	J
	WG558436	SAMP	1,2-Dichloroethane	R1883273	J
L539126-12	WG558681	SAMP	AK102 DRO C10-C25	R1884992	JJ4
	WG558436	SAMP	Naphthalene	R1883273	J
L539126-13	WG558681	SAMP	AK102 DRO C10-C25	R1884992	JJ4
	WG558436	SAMP	Total Xylenes	R1883273	J

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J	(EPA) - Estimated value below the lowest calibration point. Confidence correlates with concentration.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low
J7	Surrogate recovery limits cannot be evaluated; surrogates were diluted out
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
10/12/11 at 16:44:51

TSR Signing Reports: 358
R5 - Desired TAT

Need cooler receipt form on all samples. All samples get QC2MODCN. Analyze ALL Trip Blanks
received even if not listed on COC.

Sample: L539126-01 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
Shipping = $150 x 5 coolers = $750
Sample: L539126-02 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-03 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-04 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-05 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-06 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-07 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
run AK101 and V8260BTEXMED from 1 Trip Blank
Sample: L539126-08 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
run AK101 and V8260BTEXMED from 1 Trip Blank
Sample: L539126-09 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
MS/MSD sample
Sample: L539126-10 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-11 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-12 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-13 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10

Sample: L539126-14 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
run AK101 and V8260BTEXMED from 1 Trip Blank
Sample: L539126-15 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
run AK101 and V8260BTEXMED from 1 Trip Blank
Sample: L539126-16 Account: OASISAAK Received: 09/30/11 09:00 Due Date: 10/07/11 00:00 RPT Date: 10/11/11 09:10
run AK101 and V8260BTEXMED from 1 Trip Blank

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Est. 1970

Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Trace Metals by Method 6020		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558953**
Analysis Date:	10/6/2011	Analyst:	338
Instrument ID:	ICPMS3	Extraction Date:	10/5/2011
Sample Numbers:	L539126-04, -10, -01, -03, -05, -06, -02, -09		

Method Blank

Analyte	CAS	PQL	Qualifiers
Lead	7439-92-1	<0.00100	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Lead	0.0567	0.0512	90.3	85 - 115	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Trace Metals by Method 6020		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG559101**
Analysis Date:	10/6/2011	Analyst:	338
Instrument ID:	ICPMS4	Extraction Date:	10/5/2011
Sample Numbers:	L539126-11, -12, -13		

Method Blank

Analyte	CAS	PQL	Qualifiers
Lead	7439-92-1	<0.00100	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Lead	0.0567	0.0527	92.9	85 - 115	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Trace Metals by Method 6020		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558953**
Analysis Date:	10/6/2011	Analyst:	338
Instrument ID:	ICPMS3	Extraction Date:	10/5/2011
Sample Numbers:	L539126-04, -10, -01, -03, -05, -06, -02, -09		

Sample Duplicate
L539126-09

Name	Sample Results	Duplic Results	%RPD	Limit	Qualifiers
Lead	0.00095	0.0006	35	20	P1

Matrix Spike/Matrix Spike Duplicate
L539126-09

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Lead	0.0567	0.00067	0.0502	87.4	0.0512	89.1	75-125		2.0	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Trace Metals by Method 6020		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG559101**
Analysis Date:	10/6/2011	Analyst:	338
Instrument ID:	ICPMS4	Extraction Date:	10/5/2011
Sample Numbers:	L539126-11, -12, -13		

Sample Duplicate
L539282-06

Name	Sample Results	Duplic Results	%RPD	Limit	Qualifiers
Lead	0.00000	0.0000			

Matrix Spike/Matrix Spike Duplicate
L539282-06

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Lead	0.0567	0.00000	0.0518	91.4	0.0510	89.9	75-125		1.6	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method AK101		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558366**
Analysis Date:	10/1/2011	Analyst:	366
Instrument ID:	VOCGC5		

Sample Numbers: L539126-09, -05, -06, -10, -15, -03, -12, -02, -08, -07, -13, -14, -11, -16, -04, -01

Method Blank

Analyte	CAS	PQL	Qualifiers
TPHGAK C6 to C10		<0.100	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
TPHGAK C6 to C10	5.50	6.46	118	60 - 120	

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
TPHGAK C6 to C10	5.50	6.61	120	60 - 120	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method AK101		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558366**
Analysis Date:	10/1/2011	Analyst:	366
Instrument ID:	VOCGC5		

Sample Numbers: L539126-09, -05, -06, -10, -15, -03, -12, -02, -08, -07, -13, -14, -11, -16, -04, -01

Surrogate Summary

Laboratory	a,a,a-Trifluorotoluene - FID		a,a,a-Trifluorotoluene - PID	
Sample ID	ppb	% Rec	ppb	% Rec
LCS WG558366	223	111	227	113
LCSD WG558366	223	112	226	113
MS WG558366	223	112	227	114
MSD WG558366	223	112	229	114
MS WG558366	224	112	228	114
MSD WG558366	224	112	228	114
Blank WG558366	214	107	218	109
L539126-07	215	108	220	110
L539126-08	216	108	219	110
L539126-14	216	108	219	110
L539126-15	216	108	219	110
L539126-16	216	108	220	110
L539126-09	216	108	220	110
L539126-01	218	109	221	111
L539126-02	216	108	219	110
L539126-03	216	108	220	110
L539126-04	208	104	221	111
L539126-05	229	115	231	116
L539126-06	226	113	227	113
L539126-10	221	111	227	114
L539126-11	210	105	247 *	124
L539126-12	217	109	223	111
L539126-13	196	97.9	296 *	148

a,a,a-Trifluorotoluene (FID)	200 ppb	Limits - 62 - 128
a,a,a-Trifluorotoluene (PID)	200 ppb	Limits - 55 - 122

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method AK101		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558366**
Analysis Date:	10/1/2011	Analyst:	366
Instrument ID:	VOCGC5		

Sample Numbers: L539126-09, -05, -06, -10, -15, -03, -12, -02, -08, -07, -13, -14, -11, -16, -04, -01

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
TPHGAK C6 to C10	5.50	6.46	118	6.61	120	60-120		2.2	20	

Matrix Spike/Matrix Spike Duplicate

L539096-20

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
TPHGAK C6 to C10	5.50	0.0000	6.62	120	6.55	119	58-122		1.2	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method AK101		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558366**
Analysis Date:	10/1/2011	Analyst:	366
Instrument ID:	VOCGC5		

Sample Numbers: L539126-09, -05, -06, -10, -15, -03, -12, -02, -08, -07, -13, -14, -11, -16, -04, -01

Internal Standard Response and Retention Time Summary

FileID:1001_03.D Date:10/1/2011 Time:12:27 PM

	IS - FID		IS - PID	
	Response	RT	Response	RT
12 Hour Std	3758978	5.96	8027779	5.96
Upper Limit	7517956	6.46	16055558	6.46
Lower Limit	1879489	5.46	4013889.5	5.46
Sample ID	Response	RT	Response	RT
Blank WG558366	3536327	5.96	8744555	5.96
L539126-01	3499298	5.96	8663931	5.96
L539126-02	3532555	5.96	8683512	5.96
L539126-03	3501223	5.96	8568001	5.96
L539126-07	3575955	5.95	9031626	5.95
L539126-08	3545176	5.96	8911548	5.96
L539126-09	3424400	5.96	8409789	5.96
L539126-14	3506983	5.96	8680382	5.96
L539126-15	3537168	5.96	8715681	5.96
L539126-16	3483136	5.96	8558604	5.96
LCS WG558366	3776007	5.95	8237444	5.95
LCSD WG558366	3725102	5.96	8108142	5.96
MS WG558366	3825873	5.95	8385573	5.95
MS WG558366	3748679	5.96	8176660	5.96
MSD WG558366	3735442	5.96	8154089	5.96
MSD WG558366	3751696	5.96	8215322	5.96

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method AK101		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558366**
Analysis Date:	10/1/2011	Analyst:	366
Instrument ID:	VOCGC5		

Sample Numbers: L539126-09, -05, -06, -10, -15, -03, -12, -02, -08, -07, -13, -14, -11, -16, -04, -01

Internal Standard Response and Retention Time Summary

FileID:1001_24.D Date:10/1/2011 Time:9:10 PM

	IS - FID		IS - PID	
	Response	RT	Response	RT
12 Hour Std	3711014	5.96	7944062	5.96
Upper Limit	7422028	6.46	15888124	6.46
Lower Limit	1855507	5.46	3972031	5.46
Sample ID	Response	RT	Response	RT
L539126-04	3644255	5.96	8489913	5.96
L539126-05	3214432	5.96	7771382	5.96
L539126-06	3351057	5.96	8131515	5.96
L539126-10	3366506	5.96	8081549	5.96
L539126-11	3651062	5.96	7740948	5.96
L539126-12	3476743	5.96	8462467	5.96
L539126-13	3904506	5.96	6393758	5.96

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558436**
Analysis Date:	10/3/2011	Analyst:	74
Instrument ID:	VOCMS30		

Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Method Blank

Analyte	CAS	PQL	Qualifiers
Methyl tert-butyl ether	1634-04-4	<0.0010	
Benzene	71-43-2	<0.0010	
1,2-Dichloroethane	107-06-2	<0.0010	
Toluene	108-88-3	<0.0050	
1,2-Dibromoethane	106-93-4	<0.0010	
Ethylbenzene	100-41-4	<0.0010	
m&p-Xylene	1330-20-7	<0.0030	
o-Xylene	1330-20-7	<0.0030	
Naphthalene	91-20-3	<0.0050	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558845**
Analysis Date:	10/4/2011	Analyst:	74
Instrument ID:	VOCMS30		
Sample Numbers:	L539126-05, -10, -06		

Method Blank

Analyte	CAS	PQL	Qualifiers
Naphthalene	91-20-3	<0.0050	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Naphthalene	0.0250	0.0246	98.5	70 - 134	

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Naphthalene	0.0250	0.0242	96.7	70 - 134	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558436**
Analysis Date:	10/3/2011	Analyst:	74
Instrument ID:	VOCMS30		

Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Methyl tert-butyl ether	0.0250	0.0262	105	67 - 127	
Benzene	0.0250	0.0225	90.1	72 - 119	
1,2-Dichloroethane	0.0250	0.0249	99.7	69 - 128	
Toluene	0.0250	0.0233	93.1	75 - 114	
1,2-Dibromoethane	0.0250	0.0245	98.1	78 - 124	
Ethylbenzene	0.0250	0.0257	103	77 - 124	
m&p-Xylene	0.0500	0.0518	104	76 - 123	
o-Xylene	0.0250	0.0262	105	77 - 125	
Naphthalene	0.0250	0.0235	94.1	70 - 134	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558436**
Analysis Date:	10/3/2011	Analyst:	74
Instrument ID:	VOCMS30		

Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Methyl tert-butyl ether	0.0250	0.0268	107	67 - 127	
Benzene	0.0250	0.0226	90.4	72 - 119	
1,2-Dichloroethane	0.0250	0.0249	99.6	69 - 128	
Toluene	0.0250	0.0229	91.5	75 - 114	
1,2-Dibromoethane	0.0250	0.0252	101	78 - 124	
Ethylbenzene	0.0250	0.0253	101	77 - 124	
m&p-Xylene	0.0500	0.0515	103	76 - 123	
o-Xylene	0.0250	0.0263	105	77 - 125	
Naphthalene	0.0250	0.0246	98.4	70 - 134	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test: Volatile Organic Compounds by Method 8260B
Project No: 465-015-1-4 Matrix: Water - mg/L
Project: Nenana EPA ID: TN00003
Collection Date: 9/27/2011 **Analytic Batch: WG558436**
Analysis Date: 10/3/2011 Analyst: 74
Instrument ID: VOCMS30
Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Surrogate Summary

Laboratory	Dibromofluoromethane		Toluene-d8		4-Bromofluorobenzene		**Alternate Surrogate** a,a,a-Trifluorotoluene	
Sample ID	ppb	% Rec	ppb	% Rec	ppb	% Rec	ppb	% Rec
LCS WG558436	40.2	100	41.7	104	41.8	104	42.2	105
LCSD WG558436	40.3	101	41.3	103	41.7	104	42.4	106
MS WG558436	40.9	102	41.2	103	42.3	106	42.0	105
MSD WG558436	39.7	99.4	41.3	103	41.8	104	42.9	107
Blank WG558436	41.0	103	40.6	102	41.4	104	42.2	106
L539126-07	41.0	103	40.8	102	41.7	104	42.4	106
L539126-08	41.5	104	40.6	102	41.7	104	42.1	105
L539126-14	41.0	102	40.9	102	41.3	103	41.9	105
L539126-15	41.8	105	40.3	101	41.5	104	41.7	104
L539126-16	42.1	105	40.2	101	40.6	101	41.7	104
L539126-09	42.4	106	40.5	101	41.3	103	41.6	104
L539126-01	41.4	103	41.5	104	41.3	103	42.8	107
L539126-02	41.8	104	40.9	102	42.1	105	42.2	105
L539126-03	41.7	104	40.5	101	41.6	104	42.4	106
L539126-04	42.0	105	40.3	101	43.3	108	42.0	105
L539126-05	40.6	101	41.3	103	45.6	114	42.2	106
L539126-06	40.7	102	40.7	102	44.1	110	41.0	103
L539126-10	40.0	100	40.8	102	42.6	106	41.1	103
L539126-11	41.3	103	40.8	102	42.6	107	41.5	104
L539126-12	40.4	101	40.7	102	42.4	106	41.5	104
L539126-13	42.1	105	40.7	102	41.7	104	41.7	104

Dibromofluoromethane	40 ppb	79 - 125
Toluene - d8	40 ppb	87 - 114
4-Bromofluorobenzene	40 ppb	75 - 128
Alternate Surrogate		
a,a,a-Trifluorotoluene	40 ppb	84 - 114

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558845**
Analysis Date:	10/4/2011	Analyst:	74
Instrument ID:	VOCMS30		
Sample Numbers:	L539126-05, -10, -06		

Surrogate Summary

Laboratory	Dibromofluoromethane		Toluene-d8		4-Bromofluorobenzene		**Alternate Surrogate** a,a,a-Trifluorotoluene	
Sample ID	ppb	% Rec	ppb	% Rec	ppb	% Rec	ppb	% Rec
LCS WG558845	39.7	99.2	41.3	103	43.0	107	41.9	105
LCSD WG558845	39.8	99.6	42.1	105	42.5	106	42.1	105
MS WG558845	40.4	101	41.2	103	41.7	104	41.0	102
MSD WG558845	40.0	100.0	40.9	102	41.6	104	41.6	104
Blank WG558845	41.7	104	40.9	102	42.4	106	42.4	106
L539126-05	40.9	102	40.5	101	44.2	111	41.8	104
L539126-06	40.5	101	41.0	102	44.3	111	42.8	107
L539126-10	40.4	101	40.3	101	43.7	109	41.5	104

Dibromofluoromethane	40 ppb	79 - 125
Toluene - d8	40 ppb	87 - 114
4-Bromofluorobenzene	40 ppb	75 - 128
Alternate Surrogate		
a,a,a-Trifluorotoluene	40 ppb	84 - 114

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558436**
Analysis Date:	10/3/2011	Analyst:	74
Instrument ID:	VOCMS30		

Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Matrix Spike/Matrix Spike Duplicate

L539126-09

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Methyl tert-butyl ether	0.0250	0.0000	0.0265	106	0.0264	105	55-136		0.7	20	
Benzene	0.0250	0.0000	0.0237	94.6	0.0230	92.1	51-134		2.7	20	
1,2-Dichloroethane	0.0250	0.0000	0.0244	97.4	0.0241	96.5	59-135		0.9	20	
Toluene	0.0250	0.0000	0.0241	96.6	0.0237	94.6	61-126		2.0	20	
1,2-Dibromoethane	0.0250	0.0000	0.0252	101	0.0256	102	71-129		1.4	20	
Ethylbenzene	0.0250	0.0000	0.0276	111	0.0261	104	64-135		5.6	20	
m&p-Xylene	0.0500	0.0000	0.0552	110	0.0535	107	62-135		3.0	20	
o-Xylene	0.0250	0.0000	0.0278	111	0.0268	107	63-135		3.6	20	
Naphthalene	0.0250	0.0000	0.0243	97.2	0.0255	102	65-140		5.0	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558436**
Analysis Date:	10/3/2011	Analyst:	74
Instrument ID:	VOCMS30		

Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Methyl tert-butyl ether	0.0250	0.0262	105	0.0268	107	67-127		1.9	20	
Benzene	0.0250	0.0225	90.1	0.0226	90.4	72-119		0.4	20	
1,2-Dichloroethane	0.0250	0.0249	99.7	0.0249	99.6	69-128		0.1	20	
Toluene	0.0250	0.0233	93.1	0.0229	91.5	75-114		1.7	20	
1,2-Dibromoethane	0.0250	0.0245	98.1	0.0252	101	78-124		2.9	20	
Ethylbenzene	0.0250	0.0257	103	0.0253	101	77-124		1.5	20	
m&p-Xylene	0.0500	0.0518	104	0.0515	103	76-123		0.6	20	
o-Xylene	0.0250	0.0262	105	0.0263	105	77-125		0.6	20	
Naphthalene	0.0250	0.0235	94.1	0.0246	98.4	70-134		4.5	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558845**
Analysis Date:	10/4/2011	Analyst:	74
Instrument ID:	VOCMS30		
Sample Numbers:	L539126-05, -10, -06		

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Naphthalene	0.0250	0.0246	98.5	0.0242	96.7	70-134		1.9	20	

Matrix Spike/Matrix Spike Duplicate

L539407-02

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Naphthalene	0.0250	0.0010	0.0290	112	0.0296	114	65-140		2.0	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558436**
Analysis Date:	10/3/2011	Analyst:	74
Instrument ID:	VOCMS30		

Sample Numbers: L539126-01, -02, -03, -04, -05, -06, -07, -13, -14, -15, -16, -08, -10, -11, -09, -12

Internal Standard Response and Retention Time Summary

FileID:1003_24.D Date:10/3/2011 Time:5:55 PM

	IS1		IS2		IS3		IS4	
	Response	RT	Response	RT	Response	RT	Response	RT
12 Hour Std	237815	4.5	383507	4.84	55269	6.01	177888	8.39
Upper Limit	475630	5	767014	5.34	110538	6.51	355776	8.89
Lower Limit	118907.5	4	191753.5	4.34	27634.5	5.51	88944	7.89
Sample ID	Response	RT	Response	RT	Response	RT	Response	RT
Blank WG558436	234909	4.5	382624	4.84	53374	6.01	170054	8.39
L539126-01	227068	4.5	370209	4.84	52959	6.01	172262	8.39
L539126-02	229113	4.5	373968	4.84	53185	6.01	175530	8.39
L539126-03	229856	4.5	379364	4.84	52929	6.01	173657	8.39
L539126-04	231941	4.5	384511	4.84	53239	6.01	177022	8.39
L539126-05	241204	4.5	390729	4.84	57773	6.01	162190	8.39
L539126-06	253975	4.5	421329	4.84	60401	6.01	169219	8.39
L539126-07	232103	4.5	381046	4.84	52999	6.01	172298	8.39
L539126-08	227400	4.5	371351	4.84	51683	6	166227	8.39
L539126-09	229854	4.5	380133	4.84	53248	6.01	175434	8.39
L539126-10	252215	4.5	419364	4.84	60015	6.01	193330	8.39
L539126-11	245726	4.5	409847	4.84	56681	6.01	184552	8.39
L539126-12	244682	4.5	408198	4.84	56127	6.01	181520	8.39
L539126-13	237589	4.5	401375	4.84	55571	6.01	179008	8.39
L539126-14	227330	4.5	369335	4.84	51469	6.01	170072	8.39
L539126-15	225850	4.5	373459	4.84	51399	6	168676	8.39
L539126-16	224438	4.5	373706	4.84	52986	6.01	167121	8.39
LCS WG558436	241089	4.5	390762	4.84	56362	6	176027	8.39
LCSD WG558436	244691	4.5	399131	4.84	57787	6	180168	8.39
MS WG558436	245819	4.5	402490	4.84	56936	6	179376	8.39
MSD WG558436	248657	4.5	400210	4.84	57740	6.01	180020	8.39

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Volatile Organic Compounds by Method 8260B		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558845**
Analysis Date:	10/4/2011	Analyst:	74
Instrument ID:	VOCMS30		
Sample Numbers:	L539126-05, -10, -06		

Internal Standard Response and Retention Time Summary

FileID:1004_32.D Date:10/4/2011 Time:5:31 PM

	IS1		IS2		IS3		IS4	
	Response	RT	Response	RT	Response	RT	Response	RT
12 Hour Std	241952	4.5	391048	4.84	56006	6.01	176181	8.39
Upper Limit	483904	5	782096	5.34	112012	6.51	352362	8.89
Lower Limit	120976	4	195524	4.34	28003	5.51	88090.5	7.89
Sample ID	Response	RT	Response	RT	Response	RT	Response	RT
Blank WG558845	223494	4.5	369037	4.84	51239	6.01	168717	8.39
L539126-05	229356	4.5	377678	4.84	51856	6.01	176148	8.39
L539126-06	235059	4.5	379351	4.84	52334	6.01	174259	8.39
L539126-10	235318	4.5	390660	4.84	54418	6	176778	8.39
LCS WG558845	241061	4.5	392342	4.84	55261	6.01	177732	8.39
LCSD WG558845	236346	4.5	378992	4.84	55041	6.01	174063	8.39
MS WG558845	237537	4.5	388966	4.84	57926	6.01	175620	8.39
MSD WG558845	238749	4.5	392788	4.84	58031	6.01	176257	8.39

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	AK102 / AK103		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558681**
Analysis Date:	10/6/2011	Analyst:	164
Instrument ID:	SVGC16	Extraction Date:	10/4/2011

Sample Numbers: L539126-02, -04, -05, -10, -12, -13, -01, -03, -06, -09, -11

Method Blank

Analyte	CAS	PQL	Qualifiers
AK102 DRO C10-C25		<0.800	
AK103 RRO C25-C36		<0.200	

Laboratory Control Sample (LCS)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
AK102 DRO C10-C25	1.50	0.980	65.3	75 - 125	J4
AK103 RRO C25-C36	1.50	1.04	69.0	60 - 120	

Laboratory Control Sample Duplicate (LCSD)

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
AK102 DRO C10-C25	1.50	1.00	67.0	75 - 125	J4
AK103 RRO C25-C36	1.50	0.992	66.2	60 - 120	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	AK102 / AK103		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558681**
Analysis Date:	10/6/2011	Analyst:	164
Instrument ID:	SVGC16	Extraction Date:	10/4/2011

Sample Numbers: L539126-02, -04, -05, -10, -12, -13, -01, -03, -06, -09, -11

Surrogate Summary

Laboratory	n-Triacontane d62		o-Terphenyl	
Sample ID	ppm	% Rec	ppm	% Rec
Blank WG558681	0.0275	55.0	0.0181	90.3
LCS WG558681	0.0353	70.7		
LCSD WG558681	0.0480	96.1		
L539126-09	0.0432	86.5		
MS WG558681	0.0417	83.4		
MSD WG558681	0.0418	83.6		
L539126-01	0.0410	82.1		
L539126-02	0.0358	71.6		
L539126-03	0.0405	81.0		
L539126-04	0.0357	71.4		
L539126-05	0.0282	56.4		
L539126-06	0.0336	67.1		
L539126-10	0.0377	75.4		

n-Triacontane d62	True Value: 0.05ppm	Limits: 50 - 150
o-Terphenyl	True Value: 0.02ppm	Limits: 50 - 150

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	AK102 / AK103		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558681**
Analysis Date:	10/6/2011	Analyst:	164
Instrument ID:	SVGC16	Extraction Date:	10/4/2011

Sample Numbers: L539126-02, -04, -05, -10, -12, -13, -01, -03, -06, -09, -11

Surrogate Summary

Laboratory	n-Triacontane d62		o-Terphenyl	
Sample ID	ppm	% Rec	ppm	% Rec
L539126-11	0.0362	72.5		
L539126-12	0.0369	73.9		
L539126-13	0.0347	69.3		
Blank WG558681			0.0141	70.4
LCS WG558681			0.0165	82.3
LCSD WG558681			0.0167	83.5
L539126-09			0.0150	75.0
MS WG558681			0.0154	76.8
MSD WG558681			0.0154	77.2
L539126-01			0.0155	77.4
L539126-02			0.0143	71.7
L539126-03			0.0137	68.5
L539126-04			0.0127	63.7

n-Triacontane d62	True Value: 0.05ppm	Limits: 50 - 150
o-Terphenyl	True Value: 0.02ppm	Limits: 50 - 150

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	AK102 / AK103		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558681**
Analysis Date:	10/6/2011	Analyst:	164
Instrument ID:	SVGC16	Extraction Date:	10/4/2011

Sample Numbers: L539126-02, -04, -05, -10, -12, -13, -01, -03, -06, -09, -11

Surrogate Summary

Laboratory	n-Triacontane d62		o-Terphenyl	
Sample ID	ppm	% Rec	ppm	% Rec
L539126-10	0.0134	67.1		
L539126-11	0.0148	73.9		
L539126-12	0.0155	77.3		
L539126-13	0.0151	75.3		
L539126-05 20x			0.000	0.0 J7
L539126-06 20x			0.000	0.0 J7

n-Triacontane d62	True Value: 0.05ppm	Limits: 50 - 150
o-Terphenyl	True Value: 0.02ppm	Limits: 50 - 150

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	AK102 / AK103		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558681**
Analysis Date:	10/6/2011	Analyst:	164
Instrument ID:	SVGC16	Extraction Date:	10/4/2011

Sample Numbers: L539126-02, -04, -05, -10, -12, -13, -01, -03, -06, -09, -11

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
AK102 DRO C10-C25	1.50	0.980	65.3	1.00	67.0	75-125	J4	2.5	20	
AK103 RRO C25-C36	1.50	1.04	69.0	0.992	66.2	60-120		4.2	20	

Matrix Spike/Matrix Spike Duplicate

L539126-09

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
AK102 DRO C10-C25	1.50	0.240	1.07	55.3	1.11	57.7	75-125	J6	3.2	20	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558585**
Analysis Date:	10/4/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/3/2011
Sample Numbers:	L539126-02, -05, -03, -04, -01		

Method Blank

Analyte	CAS	PQL	Qualifiers
Ethylene Dibromide	106-93-4	<0.0000100	
1,2-Dibromo-3-Chloropropane	96-12-8	<0.0000200	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558955**
Analysis Date:	10/5/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/5/2011
Sample Numbers:	L539126-12, -06, -09, -11, -10, -13		

Method Blank

Analyte	CAS	PQL	Qualifiers
Ethylene Dibromide	106-93-4	<0.0000100	
1,2-Dibromo-3-Chloropropane	96-12-8	<0.0000200	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558585**
Analysis Date:	10/4/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/3/2011
Sample Numbers:	L539126-02, -05, -03, -04, -01		

Laboratory Fortified Blank (LFB)

Column #1

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000248	99.2	70 - 130	
1,2-Dibromo-3-Chloropropane	0.000250	0.000253	101	70 - 130	

Laboratory Fortified Blank Duplicate (LCSD)

Column #1

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000224	89.6	70 - 130	
1,2-Dibromo-3-Chloropropane	0.000250	0.000225	89.8	70 - 130	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558585**
Analysis Date:	10/4/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/3/2011
Sample Numbers:	L539126-02, -05, -03, -04, -01		

Laboratory Fortified Blank (LFB)
Column #2

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000141	56.5	70 - 130	J4
1,2-Dibromo-3-Chloropropane	0.000250	0.000099	39.9	70 - 130	J4

Laboratory Fortified Blank Duplicate (LCSD)
Column #2

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000129	51.7	70 - 130	J4
1,2-Dibromo-3-Chloropropane	0.000250	0.000076	30.7	70 - 130	J4

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558955**
Analysis Date:	10/5/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/5/2011
Sample Numbers:	L539126-12, -06, -09, -11, -10, -13		

Laboratory Fortified Blank (LFB)
Column #1

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000241	96.5	70 - 130	
1,2-Dibromo-3-Chloropropane	0.000250	0.000236	94.3	70 - 130	

Laboratory Fortified Blank Duplicate (LCSD)
Column #1

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000225	90.1	70 - 130	
1,2-Dibromo-3-Chloropropane	0.000250	0.000240	95.9	70 - 130	

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558955**
Analysis Date:	10/5/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/5/2011
Sample Numbers:	L539126-12, -06, -09, -11, -10, -13		

Laboratory Fortified Blank (LFB)
Column #2

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000190	76.0	70 - 130	
1,2-Dibromo-3-Chloropropane	0.000250	0.000139	55.4	70 - 130	J4

Laboratory Fortified Blank Duplicate (LCSD)
Column #2

Analyte	True Value	Found	Recovery %	Control Limits	Qualifiers
Ethylene Dibromide	0.000250	0.000179	71.5	70 - 130	
1,2-Dibromo-3-Chloropropane	0.000250	0.000142	56.9	70 - 130	J4

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558585**
Analysis Date:	10/4/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/3/2011
Sample Numbers:	L539126-02, -05, -03, -04, -01		

Matrix Spike
L539022-03
Column #1

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Ethylene Dibromide	0.00010	0.00000	0.00012	120			70-130				
1,2-Dibromo-3-	0.00010	0.00000	0.00010	109			70-130				

Matrix Spike
L539022-03

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Ethylene Dibromide	0.00010	0.00000	0.00006	65.9			70-130	J6			
1,2-Dibromo-3-	0.00010	0.00000	0.00004	44.9			70-130	J6			

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558585**
Analysis Date:	10/4/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/3/2011
Sample Numbers:	L539126-02, -05, -03, -04, -01		

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Column #1

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Ethylene Dibromide	0.00025	0.00024	99.2	0.00022	89.6	70-130		10	25	
1,2-Dibromo-3-Chloropropane	0.00025	0.00025	101	0.00022	89.8	70-130		12	25	

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Column #2

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Ethylene Dibromide	0.00025	0.00014	56.5	0.00012	51.7	70-130	J4	8.8	25	
1,2-Dibromo-3-Chloropropane	0.00025	0.00009	39.9	0.00007	30.7	70-130	J4	26	25	J3

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558955**
Analysis Date:	10/5/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/5/2011
Sample Numbers:	L539126-12, -06, -09, -11, -10, -13		

Matrix Spike
L539126-09
Column #1

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Ethylene Dibromide	0.00010	0.00000	0.00013	132			70-130	J5			
1,2-Dibromo-3-	0.00010	0.00000	0.00011	117			70-130				

Matrix Spike
L539126-09

Analyte	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qualifier	% RPD	Control Limits	RPD Qual
Ethylene Dibromide	0.00010	0.00000	0.00010	101			70-130				
1,2-Dibromo-3-	0.00010	0.00000	0.00006	62.9			70-130	J6			

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Quality Control Summary
SDG: L539126
OASIS Environmental - Anchorage, AK

Test:	Method 504/8011		
Project No:	465-015-1-4	Matrix:	Water - mg/L
Project:	Nenana	EPA ID:	TN00003
Collection Date:	9/27/2011	**Analytic Batch:**	**WG558955**
Analysis Date:	10/5/2011	Analyst:	267
Instrument ID:	SVGC10	Extraction Date:	10/5/2011
Sample Numbers:	L539126-12, -06, -09, -11, -10, -13		

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Column #1

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Ethylene Dibromide	0.00025	0.00024	96.5	0.00022	90.1	70-130		6.8	25	
1,2-Dibromo-3-Chloropropane	0.00025	0.00023	94.3	0.00024	95.9	70-130		1.7	25	

Laboratory Control Sample/ Laboratory Control Sample Duplicate

Column #2

Analyte	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	Qualifier	% RPD	Control Limits	Qualifier
Ethylene Dibromide	0.00025	0.00019	76.0	0.00017	71.5	70-130		6.2	25	
1,2-Dibromo-3-Chloropropane	0.00025	0.00013	55.4	0.00014	56.9	70-130	J4	2.6	25	

OASIS Environmental - Anchorage, AK

825 W. 8th Ave.
Anchorage,AK 99501

Billing information:

Accounts Payable
825 W. 8th Ave.

Anchorage,AK 99501

Analysis/Container/Preservative

G172

Chain of Custody
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Report to: Dan Frank

Email: D.Frank@oasisenviro.com; A

Project Description: Nenana

City/State Collected

Phone: (907) 350-4897
FAX: (907) 258-4033

Client Project #: 465-015-1-4

Lab Project #: OASISAAK-NENANA

Collected by (print): A Hanson/S Christianson

Site/Facility ID#:

P.O.#:

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day.....100%
___ Two Day.....50%
___ Three Day.....25%

Date Results Needed: STD TURN

Email? ___No X Yes
FAX? ___No ___Yes

Acctnum: OASISAAK (lab use only)
Template/Prelogin: T74121/ P369204
Cooler #: 9/21/11 MW
Shipped Via: FedEX 2nd Day

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	AK101 40mlAmb HCl	AK101- Trip Blank 40mlAmb-HCl-Blk	AK102/103 IL-Amb-Add HCl	PBG 500mlHDPE-HNO3	SV8011 40mlClr-NaThio	V8260BTEXMED 40mlAmb-HCl	V8260BTEXMED- TB 40mlAmb-HCl-Blk	Remarks/Contaminant	Sample # (lab only)
11-NEN-MW6-02-GW	Grab	GW	NA	9/27/11	1120	12	X		X	X	X	X			L539126-01
11-NEN-MW1-02-GW		GW		9/27/11	1340	11 12	X		X	X	X	X			-02
11-NEN-MW2-02-GW		GW		9/27/11	1345	12	X		X	X	X	X			-03
11-NEN-MW3-02-GW		GW		9/27/11	1530	12	X		X	X	X	X			-04
11-NEN-MW4-02-GW		GW		9/27/11	1545	12	X		X	X	X	X			-05
11-NEN-20-02-GW		GW		9/27/11	2200	12	X		X	X	X	X			-06
TRIP BLANK		GW		9/27/11	1830	1 12	X	X	X	X	X	X	X		-07
TRIP BLANK		GW		9/27/11	1800	1 12	X	X	X	X	X	X	X		-08
11-NEN-TP16-02-GW	↓	GW	↓	9/28/11	1110	12	X		X	X	X	X		MS/MSD	-09
						30									

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Flow _____ Other _____

Remarks:

one trip blank in each cooler for a total of 5, Please analyze all.

5086 5814 7041
5086 5814 7074

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	9/29/11	1200	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Kim Wilson

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐

Temp: 3.4°C Bottles Received: 160

Date: 9/30/11 Time: 0900

Condition: (lab use only) OK

COC Seal Intact: ___ Y ___ N ___ NA

pH Checked: <2 NCF:

OASIS Environmental - Anchorage, AK

825 W. 8th Ave.
Anchorage,AK 99501

Billing information:

Accounts Payable
825 W. 8th Ave.

Anchorage,AK 99501

Report to: **Dan Frank**

Email: **D.Frank@oasisenviro.com; A**

Project Description: **Nenana**

City/State Collected:

Phone: **(907) 350-4897**
FAX: **(907) 258-4033**

Client Project #: 465-015-1-4

Lab Project #: **OASISAAK-NENANA**

Collected by (print): A Hansen/S Christiansen

Site/Facility ID#:

P.O.#:

Collected by (signature): A Hansen

Immediately Packed on Ice N__ Y X

Rush? (Lab MUST Be Notified)
__ Same Day 200%
__ Next Day.....100%
__ Two Day 50%
__ Three Day 25%

Date Results Needed: STD Turn

Email? __No X Yes
FAX? __No __Yes

Analysis/Container/Preservative

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	AK101 40mlAmb HCl	AK101- Trip Blank 40mlAmb-HCl-Blk	AK102/103 1L-Amb-Add HCl ≤2	PBG 500mlHDPE-HNO3 ≤2	SV8011 40mlClr-NaThio	V8260BTEXMED 40mlAmb-HCl	V8260BTEXMED- TB 40mlAmb-HCl-Blk	Remarks/Contaminant	Sample # (lab only)
11-NEN-TP2-02-GW	Grab	GW	NA	9/28/11	1115	12	X		X	X	X	X			L539126 -10
11-NEN-TP5-02-GW		GW		9/28/11	1530	12	X		X	X	X	X			-11
11-NEN-TP4-02-GW		GW		9/28/11	1715	12	X		X	X	X	X			-12
11-NEN-MW5-02-GW		GW		9/28/11	1800	12	X		X	X	X	X			-13
		GW				12	X		X	X	X	X			
		GW				12	X		X	X	X	X			
TRIP BLANK		GW		9/28/11	2030	1		X					X		-14
TRIP BLANK		GW		9/28/11	2000	1		X					X		-15
TRIP Blank		GW		9/28/11	2100	1		X					X		-16

*Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Flow _____ Other _____

Remarks:
One trip blank in each cooler for a total of 5
Please analyze all.

5036 5814 7063
5036 5814 7052 5036 5814 7085

Relinquished by: (Signature) A Hansen — Date: 9/29/11 — Time: 1200 — Received by: (Signature)

Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)

Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature) Kim Weldon — Date: 9/30/11 — Time: 0900

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp 3.4°C Bottles Received: 160

Condition: (lab use only) (OK)
COC Seal Intact: ✓ Y __ N __ NA
pH Checked: ≤2 NCF:

ESC LAB SCIENCES
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone: (800) 767-5859
Phone: (615) 758-5858
Fax: (615) 758-5859

Chain of Custody
Page 2 of 2

Acctnum: **OASISAAK** (lab use only)
Template/Prelogin: **T74121/ P369204**
Cooler #: 9/21/11 MW
Shipped Via: **FedEX 2nd Dav**

L539126

ESC
L·A·B S·C·I·E·N·C·E·S

Cooler Receipt Form

Client: OASIS Environmental

Cooler Received On: 9/30/11 and Opened On: 9/30/11 By: Kevin Wallace

Kevin Wallace
(Signature)

Temperature of cooler when opened: 3.4° Degrees Celsius/ Was sufficient ice used: Yes ☐ No ☐

What kind of packing material was used? Bubblewrap ☑ Peanuts ☐ Other ☐ None ☐

	Yes	No
Were custody seals on outside of cooler and intact?	☑	☐
Were custody papers properly filled out (ink, signed, etc.)?	☑	☐
Did you sign the custody papers in the appropriate place?	☑	☐
Did all bottles arrive in good condition?	☑	☐
Were all bottle labels complete? (#, date, signed, pres, etc)?	☑	☐
Did all bottle labels and tags agree with custody papers?	☑	☐
Were correct bottles used for the analyses requested?	☑	☐
Was sufficient amount of sample sent in each bottle?	☑	☐
Were correct preservatives used?	☑	☐
If applicable, was an observable VOA headspace present?	☐	☑
Non Conformance Generated: *(See attached NCF if yes)*	☐	☐

MEMORANDUM

Date: November 18, 2011

From: Melissa Pike, Associate Environmental Scientist/ Data Review, OASIS Environmental, Inc., Anchorage, Alaska

To: Daniel Frank, Project Manager, OASIS Environmental, Inc., Anchorage, Alaska

Subject: **Quality Assurance Review, September 2011 Groundwater Monitoring, Nenana Header Area and Rail Line Site, Nenana, Alaska**

Ref: OASIS Project Number 465-015 / 0147038

Laboratory quality assurance/quality control (QA/QC) data associated with the analysis of project samples has been reviewed to evaluate the usability of the analytical data generated during the September 2011 groundwater monitoring event at Crowley's Nenana Header Area and Rail Line Site in Nenana, Alaska (AK).

Water samples were shipped to ESC Lab Sciences (ESC) located in Mount. Juliet, Tennessee and reported in the following one sample delivery group (SDG), L539126. A total of two QC samples were submitted to the lab for analysis (including one duplicate sample and one trip blank). Field QC samples were collected at the acceptable frequency based on the number of samples per matrix collected. Samples were collected, reported, and shipped in general accordance with the Alaska Department of Environmental Conservation (ADEC)-approved work plan (OASIS 2011).

All data were reviewed in accordance with United States Environmental Protection Agency (USEPA) National Functional Guidelines for Organic Methods (USEPA 2008), analytical methodology and ADEC regulatory guidance documents (ADEC 2002; 2005; 2008; 2009; 2010). This data review focused on the following QC parameters and impact on data quality objectives (DQOs): usability: sample handling and chain-of-custody (CoC) documentation; holding time compliance; field QC (trip blanks, field duplicates); laboratory QC (method blanks, laboratory control samples (LCS) and LCS duplicates (LCSD), surrogates, matrix spikes (MS) and MS duplicates (MSD), method reporting limits; and completeness.

Samples were analyzed by the off-site laboratory using the following methods for the associated analytes:

- Benzene, ethylbenzene, toluene, and xylenes (BTEX); EPA Method SW8260B
- Gasoline-range organic compounds (GRO); AK Method 101
- Diesel-range organic compounds (DRO); AK102
- Residual-range organic compounds (RRO); AK103
- Lead; USEPA Method SW6020
- Ethylene Dibromide and 1,2-Dibromo-3-Chloropropane; EPA SW8011

Results that were detected at concentrations below the practical quantitation limit (PQLs) but above the method detection limits (MDLs) were flagged "J" and considered estimated. Results detected at concentrations below the MDL are considered not detected (ND).

Some sample results are considered estimations due to minor QA/QC discrepancies; however, all sample results are considered usable for project objectives. The details of this review and qualification of the data are summarized in the following sections.

SAMPLE HANDLING AND CHAIN OF CUSTODY

Samples were hand delivered to FedEx in Fairbanks, AK for overnight air delivery to ESC from Nenana, AK. Five sample coolers were shipped and were delivered with custody seals in place, unbroken, and intact. CoC forms, laboratory sample receipt forms, and case narratives were reviewed to determine if sample handling impacted the integrity of the samples or the quality of the associated data. The sample cooler was received at the laboratory intact, with proper documentation, and at the specified temperature range of 4°C ± 2°C.

All samples were extracted, digested, and analyzed within the holding time criteria for the applicable analytical methods and in accordance with the work plan specifications.

FIELD QA/QC

Trip blanks that accompany the sample glassware from the ESC to the field and return to the laboratory with field samples are designed to monitor for possible contamination during collection of samples collected in the field and transport to the off-site laboratory. Collection and analysis of field duplicates also facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures and laboratory analyses. For this project, trip blanks and field duplicates were submitted for analysis.

Trip Blanks

Five water trip blanks were submitted for GRO/BTEX analysis. Trip blank results were reported ND, below the PQL for all analytes.

Field Duplicates

Out of ten primary samples submitted, one field duplicate sample was collected – primary sample 11-NEN-MW4-02-GW with duplicate sample 11-NEN-MW20-02-GW. The frequency of field duplicate collection met the 10% frequency requirements specified in the work plan. Primary sample and duplicate relative percent differences (RPDs) were below ADEC established criteria of <30% between water sample results. Overall, there was adequate comparability of field duplicate results to meet project DQO.

LABORATORY QA/QC

Method Blanks

Method blanks were analyzed concurrent with an extraction batch of 20 or fewer primary samples or for each 12 hour period for SW8260B. Method blanks were analyzed at the required frequency and target analytes were ND in the blanks at concentrations above the PQLs.

Laboratory Control Samples/ Matrix Spikes

The percent recoveries (%R) and RPDs for MS/MSD and LCS/LSCD analytes were within required limits with one exception. The LCS/LCSD and MS/MSD DRO %R was below the quality assurance limits. The associated results were MW-1-02-GW, MW2-02-GW, MW3-02-GW, MW4-02-GW, MW20-02-GW, MW5-02-GW, MW6-02-GW, TP2-02-GW, TP4-02-GW, TP5-02-GW and TP6-02-GW. Results were qualified as estimated (J). All data is suitable for use.

Surrogates

System Monitoring Compounds (Surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes. These compounds are added to each sample prior to collection (soil volatile samples) or during sample preparation or extraction. Subsequently, surrogate recovery indicates overall method performance. All surrogates were within method or laboratory limits.

Method Detection Limits

The MDLs provided adequate sensitivity needed to meet project objectives and all PQLs were below ADEC cleanup levels in the project samples.

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, MS/MSDs and field duplicate pairs for this project. Field duplicates and MS/MSD samples were collected in accordance with Work Plan specifications. Field duplicate RPDs met applicable control limits. Recoveries and RPDs for all LCS/LSCD samples were within required limits, with the exception noted in previous sections. Data Quality Objectives of an overall 90% accuracy in QC samples were met.

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 100%:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

All requested analyses were performed in accordance with work plan specifications. No results were qualified as unusable (i.e., “R”). Completeness for this project is 100%.

REPRESENTATIVENESS

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the work plan and verified in the field to account accurately for site variations and sample matrices. The DQO for representativeness were met.

COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

DATA SUMMARY

All requested analyses were performed in accordance with work plan specifications with a few exceptions. None of the associated data is considered unusable (i.e., "R"). Completeness for this project is 100%. In general, the overall quality of the data is acceptable with a few qualifications. Overall, data quality meets DQOs established for this project and all sample results are usable for the purpose of this investigation.

REFERENCES:

ADEC. 2002. Underground Storage Tanks Procedures Manual, November 7.

ADEC. 2005. Draft Guidance on Developing Conceptual Site Models, March 24.

ADEC. 2008. 18 AAC 75, Oil and Other Hazardous Substances Pollution Control, October 9.

ADEC. 2009. Technical Memorandum: Environmental Laboratory Data and Quality Assurance Requirements. March.

ADEC. 2010. Laboratory Data Review Checklist. Version 2.7. January.

OASIS Environmental, Inc. 2011. Groundwater Monitoring Work Plan; Nenana Header Area and Rail Line Site, Nenana, Alaska. September.

USEPA. 2008. Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA 540/R-94/012).

Laboratory Data Review Checklist

Completed by:	Melissa Pike		
Title:	Environmental Scientist	Date:	Nov 17, 2011
CS Report Name:	September 2011 Groundwater Monitoring, Nenana Header Area and Rail Line Site, Nenana, Alaska	Report Date:	November 2011
Consultant Firm:	OASIS Environmental		
Laboratory Name:	ESC Lab Sciences	Laboratory Report Number:	L539126
ADEC File Number:		ADEC RecKey Number:	

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

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

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

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

No samples were transferred or subcontracted.

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:

Samples were received at 3.4°C.

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:

Samples arrived in good condition.

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:

There were no discrepancies.

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

Comments:

Data quality and usability are not affected with respect to the laboratory sample receipt documentation.

4. Case Narrative

a. Present and understandable?

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

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

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

There are no discrepancies, errors of QC failures.

c. Were all corrective actions documented?

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

There were no corrective actions.

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

Comments:

Data quality and usability is not affected with respect to the case narrative report.

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:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

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

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

Comments:

Data quality and usability is not affected with respect to the reported sample 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

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

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

No samples are above the PQL.

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

Data quality and usability is not affected with respect to the reported method blank results.

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:

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:

LCS/LCSD and MS/MSD DRO %R was below the quality assurance limits.

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

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

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

Comments:

MW-1-02-GW, MW2-02-GW, MW3-02-GW, MW4-02-GW, MW20-02-GW, MW5-02-GW, MW6-02-GW, TP2-02-GW, TP4-02-GW, TP5-02-GW and TP6-02-GW.

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

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

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

Data quality and usability is somewhat affected. The associated results are considered estimated (J).

c. Surrogates - Organics Only

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

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

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

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

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

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

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

Data quality and usability is affected with respect to the reported surrogate results. Refer to QAR for further details.

d. Trip Blank - Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

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

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

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

iii. All results less than PQL?

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

iv. If above PQL, what samples are affected?

Comments:

NA. All results were <PQL.

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

Comments:

Data quality and usability is not affected with respect to the reported trip blank results.

e. Field Duplicate

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

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

primary sample 11-NEN-MW4-02-GW with duplicate sample 11-NEN-MW20-02-GW

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:

Data quality and usability is not affected with respect to the reported field duplicate results.

f. Decontamination or Equipment Blank (if applicable)

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

All sampling equipment was disposable.

i. All results less than PQL?

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

All sampling equipment was disposable.

ii. If above PQL, what samples are affected?

Comments:

NA.

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

Comments:

NA. All sampling equipment was disposable.

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

a. Defined and appropriate?

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

There were no additional data qualifiers.

Reset Form

ATTACHMENT 5

CSM Form and Graphic

- Page Intentionally Left Blank -

Print Form

Human Health Conceptual Site Model
Scoping Form

Site Name: Crowley Marine Fuel Terminal, Header Area/Rail Line Site, Nenana, Alaska

File Number: Fuel Header (110.38.010); Rail Line/Middle Tank Farm (110.38.011)

Completed by: OASIS Environmental, Inc.

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: Underground pipelines

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:

Contaminants are present within 15 feet bgs (BTEX, GRO, DRO, naphthalene, and methylnaphthalene)

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:

Naphthalene was detected above ADEC SCL.

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:

Groundwater is not currently used for drinking water.

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: Complete

Comments:

Surface water had not been sampled for TAH and TAqH.

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:

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:

BTEX, methylnaphthalene, GRO, DRO

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: Incomplete

Comments:

No regularly occupied buildings within 30 feet of site.

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:

Groundwater is potentially used at one well for non-drinking purposes, such as hand washing. OASIS had sampled this well, not contaminants of concern are above ADEC groundwater cleanup levels. Surface water is not expected to be a safe swimming water body due to the swift current. Groundwater is likely deeper than most 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:

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:

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:

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

APPENDIX A

BIOACCUMULATIVE COMPOUNDS OF POTENTIAL CONCERN

Organic compounds are identified as bioaccumulative if they have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5. Inorganic compounds are identified as bioaccumulative if they are listed as such by EPA (2000). Those compounds in Table B-1 of 18 AAC 75.341 that are bioaccumulative, based on the definition above, are listed below.

Aldrin	DDT	Lead
Arsenic	Dibenzo(a,h)anthracene	Mercury
Benzo(a)anthracene	Dieldrin	Methoxychlor
Benzo(a)pyrene	Dioxin	Nickel
Benzo(b)fluoranthene	Endrin	PCBs
Benzo(k)fluoranthene	Fluoranthene	
Cadmium	Heptachlor	Pyrene
Chlordane	Heptachlor epoxide	Selenium
Chrysene	Hexachlorobenzene	Silver
Copper	Hexachlorocyclopentadiene	Toxaphene
DDD	Indeno(1,2,3-c,d)pyrene	Zinc
DDE		

Because BCF values can relatively easily be measured or estimated, the BCF is frequently used to determine the potential for a chemical to bioaccumulate. A compound with a BCF greather than 1,000 is considered to bioaccumulate in tissue (EPA 2004b).

For inorganic compounds, the BCF approach has not been shown to be effective in estimating the compound's ability to bioaccumulate. Information available, either through scientific literature or site-specific data, regarding the bioaccumulative potential of an inorganic site contaminant should be used to determine if the pathway is complete.

The list was developed by including organic compounds that either have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5 and inorganic compounds that are listed by the United States Environmental Protection Agency (EPA) as being bioaccumulative (EPA 2000).

The list was developed by including organic compounds that either have a BCF equal to or greater than 1,000 or a log K_{ow} greater than 3.5 and inorganic compounds that are listed by the United States Environmental Protection Agency (EPA) as being bioaccumulative (EPA 2000). The BCF can also be estimated from a chemical's physical and chemical properties. A chemical's octanol-water partitioning coefficient (K_{ow}) along with defined regression equations can be used to estimate the BCF. EPA's Persistent, Bioaccumulative, and Toxic (PBT) Profiler (EPA 2004) can be used to estimate the BCF using the K_{ow} and linear regressions presented by Meylan et al. (1996). The PBT Profiler is located at http://www.pbtprofiler.net/. For compounds not found in the PBT Profiler, DEC recommends using a log K_{ow} greater than 3.5 to determine if a compound is bioaccumulative.

APPENDIX B

VOLATILE COMPOUNDS OF POTENTIAL CONCERN

A chemical is identified here as sufficiently volatile and toxic for further evaluation if the Henry's Law constant is 1 x 10^{-5} atm-m^3/mol or greater, the molecular weight is less than 200 g/mole (EPA 2004a), and the vapor concentration of the pure component posed an incremental lifetime cancer risk greater than 10^{-6} or a non-cancer hazard quotient of 0.1, or other available scientific data indicates the chemical should be considered a volatile. Chemicals that are solid at typical soil temperatures and do not sublime are generally not considered volatile.

Acetone	Mercury (elemental)
Benzene	Methyl bromide (Bromomethane)
Bis(2-chloroethyl)ether	Methyl chloride (Chloromethane)
Bromodichloromethane	Methyl ethyl ketone (MEK)
Bromoform	Methyl isobutyl ketone (MIBK)
n-Butylbenzene	Methylene bromide
sec-Butylbenzene	Methylene chloride
tert-Buytlbenzene	**1-Methylnaphthalene**
Carbon disulfide	**2-Methylnaphthalene**
Carbon tetrachloride	Methyl *tert*-butyl ether (MTBE)
Chlorobenzene	**Naphthalene**
Chlorodibromomethane (Dibromochloromethane)	Nitrobenzene
Chloroethane	n-Nitrosodimethylamine
Chloroform	**n-Propylbenzene**
2-Chlorophenol	**Styrene**
1,2-Dichlorobenzene	1,1,2,2-Tetrachlorethane
1,3-Dichlorobenzene	Tetrachloroethylene (PCE)
1,4-Dichlorobenzene	**Toluene**

Dichlorodifluoromethane	1,2,4-Trichlorobenzene
1,1-Dichloroethane	1,1,1-Trichloroethane
1,2-Dichloroethane	1,1,2-Trichloroethane
1,1-Dichloroethylene	Trichloroethane
cis-1,2-Dichloroethylene	2,4,6-Trichlorophenol
trans-1,2-Dichloroethylene	1,2,3-Trichloropropane
1,2-Dichloropropane	1,1,2-Trichloro-1,2,2-trifluoroethane (Freon-113)
1,3-Dichloropropane	Trichlorofluoromethane (Freon-11)
Ethylbenzene	**1,2,4-Trimethylbenzene**
Ethylene dibromide (1,2-Dibromoethane)	**1,3,5-Trimethylbenzene**
Hexachlorobenzene	Vinyl acetate
Hexachloro-1,3-butadiene	Vinyl chloride (Chloroethene)
Hexachlorocyclopentadiene	**Xylenes (total)**
Hexachloroethane	GRO (see note 3 below)
Hydrazine	DRO (see note 3 below)
Isopropylbenzene (Cumene)	RRO (see note 3 below)

Notes:

1. Bolded chemicals should be investigated as volatile compounds when petroleum is present. If fuel containing additives (e.g., 1,2-dichloroethane, ethylene dibromide, methyl *tert*-butyl ether) were spilled, these chemicals should also be investigated.
2. If a chemical is not on this list, and not in Tables B of 18 AAC 75.345, the chemical has not been evaluated for volatility. Contact the ADEC risk assessor to determine if the chemical is volatile.
3. At this time, ADEC does not require evaluation of petroleum ranges GRO, DRO, or RRO for the indoor air inhalation (vapor intrusion) pathway.

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Crowley Marine Services
Nenana Fuel Terminal, Header Area/Rail Line, Nenana, Alaska

Completed By: OASIS Environmental, Inc.
Date Completed: November 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.*

(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.*

Media / Transport Mechanisms / Exposure Media / Exposure Pathway/Route / Current & Future Receptors

Media	Transport Mechanisms	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
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil — check soil	☑ soil	☑ Incidental Soil Ingestion		C/F	C/F	C/F			
	☑ Migration to subsurface — check soil		☑ Dermal Absorption of Contaminants from Soil		C/F	C/F	C/F			
	☑ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☑ 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	☑ groundwater	☑ Ingestion of Groundwater		F	F	F			
	☑ Migration to groundwater — check groundwater		☑ Dermal Absorption of Contaminants in Groundwater		C/F	C/F	C/F			
	☑ Volatilization — check air		☑ Inhalation of Volatile Compounds in Tap Water		C/F	F	C/F			
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Ground-water	☑ Direct release to groundwater — check groundwater	☑ air	☑ Inhalation of Outdoor Air		C/F	C/F	C/F			
	☑ Volatilization — check air		☐ Inhalation of Indoor Air							
	☑ Flow to surface water body — check surface water		☐ Inhalation of Fugitive Dust							
	☑ Flow to sediment — check sediment									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Surface Water	☑ Direct release to surface water — check surface water	☑ surface water	☑ Ingestion of Surface Water		C/F	C/F	C/F	C/F		
	☐ Volatilization — check air		☑ Dermal Absorption of Contaminants in Surface Water		C/F	C/F	C/F	C/F		
	☑ Sedimentation — check sediment		☑ Inhalation of Volatile Compounds in Tap Water					C/F		
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Sediment	☑ Direct release to sediment — check sediment	☑ sediment	☑ Direct Contact with Sediment		C/F	C/F	C/F	C/F		
	☑ Resuspension, runoff, or erosion — check surface water									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
		☐ biota	☐ Ingestion of Wild or Farmed Foods							

Revised, 10/01/2010

ATTACHMENT 6

September 2010 Figure 4

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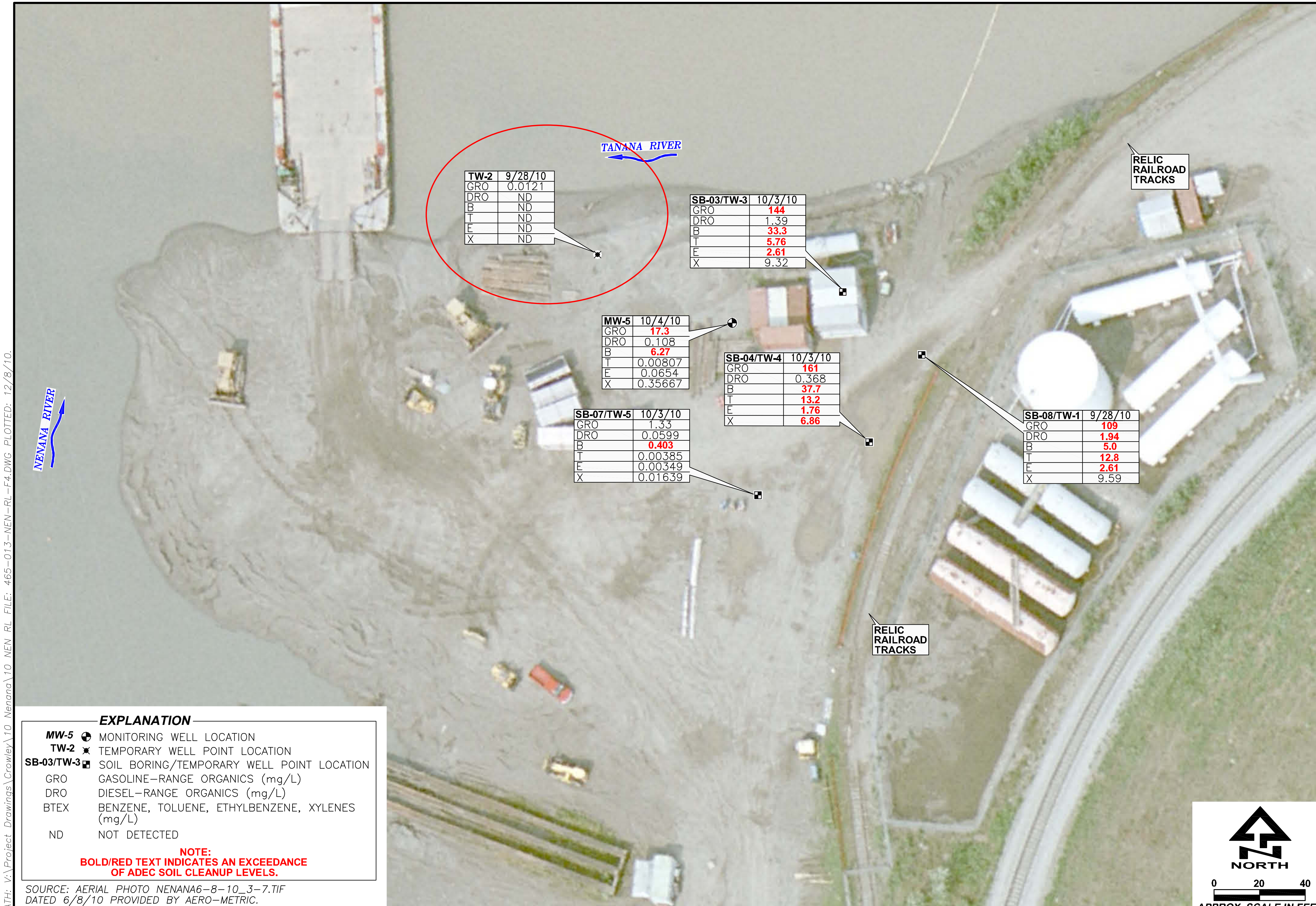

EXPLANATION

MW-5	MONITORING WELL LOCATION
TW-2	TEMPORARY WELL POINT LOCATION
SB-03/TW-3	SOIL BORING/TEMPORARY WELL POINT LOCATION
GRO	GASOLINE-RANGE ORGANICS (mg/L)
DRO	DIESEL-RANGE ORGANICS (mg/L)
BTEX	BENZENE, TOLUENE, ETHYLBENZENE, XYLENES (mg/L)
ND	NOT DETECTED

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

SOURCE: AERIAL PHOTO NENANA6-8-10_3-7.TIF
DATED 6/8/10 PROVIDED BY AERO-METRIC.

PATH: V:\Project Drawings\Crowley\10 Nenana\10 NEN RL FILE: 465-013-NEN-RL-F4.DWG PLOTTED: 12/8/10.

FIGURE 4

GROUNDWATER ANALYTICAL RESULTS SUMMARY

NENANA RAIL LINE SITE
INITIAL CHARACTERIZATION REPORT
CROWLEY MARITIME CORPORATION
Nenana, Alaska

DATE: DEC. 2010
CHKD: A.M.H.
DRAWN: C.L.H
PROJ. No.: 465-013

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