Milepost 205 Richardson Highway Spill
September 2012 Groundwater Monitoring Well Report
Summit Lake, Alaska

Report Submitted:
April 2013

ALASKA RESOURCES & ENVIRONMENTAL SERVICES, LLC

SUBMITTED TO:
Alaska Department of Environmental Conservation
Northern Regional Office
Spill Prevention and Response
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INTRODUCTION

This report was prepared on behalf of Big State Logistics Inc., who has contracted with Alaska Resources & Environmental Services (ARES) to perform the groundwater investigation associated with the petroleum release of diesel fuel as detailed in the ARES Release Investigation / Phase II ESA dated April 2010. The release occurred at milepost 205 of the Richardson highway. The ADEC file ID number for this site is 140.38.052. The work described in this report was conducted as described in the ADEC approved Work Plan submitted in March 2009.

The objective of our work was to obtain groundwater sample data near the site of a former petroleum release in order to access the impacts to groundwater and to evaluate the extent of groundwater migration. Groundwater samples were collected from monitoring wells MW-1 through MW-6 that were installed in March 2009. Collection of the groundwater samples occurred on September 23, 2012. All groundwater samples were collected from monitoring wells in general accordance with ADEC Oil and Other Hazardous Substances Pollution Control Regulations (18 AAC 75 – amended October 09, 2008).

SITE BACKGROUND

Site Description

The petroleum release occurred on State of Alaska owned property located at Mile 205 Richardson Highway within the State of Alaska Department of Transportation (D.O..T.) right-of-way (ROW) corridor (Figure 1,2). The D.O.T. manages the ROW which is 150' from road centerline. Lands outside of the D.O.T. corridor are owned and managed by Department of Interior Bureau of Land Management (BLM).

Lands in the vicinity of the spill are undeveloped. The GPS coordinates for the spill site is N 63º 15.447', W -145 º 41.118'. The elevation of the site is approximately 2800' above mean sea level according to topographical map of the area.

History

On December 30, 2008 a tanker truck owned and operated by Big State Logistics Inc., (BSL) was involved in an accident at milepost 205 on the Richardson highway (Appendix A, Figure 1). A fuel trailer separated from the tanker truck, overturned and came to rest in a ditch on the east side of the highway. No injuries were reported. The trailer released all of the approximately 4,000-gallons of #2 Diesel fuel it contained onto the ground surface.

Initial cleanup attempts took place January 19, 2009. A total of 140 cubic yards of contaminated soil/ snow was transported to OIT, Moose Creek facility for thermal remediation.

In March 2009 ARES conducted a groundwater investigation that included the installation of six permanent groundwater monitoring wells. Monitoring well locations can be found in Appendix A, Figure 2.

Additional groundwater monitoring events were conducted by Alaska Resources and Environmental Services in September 2009, September 2010, July 2011, and September 2012. A summary of recent and historical groundwater sampling data is included in Table 1 and Table 2 of this report.

Topography

The United States Geological Survey (USGS) Mt. Hayes quad (B-4) provides topographic map coverage of the site (Figure 1). The subject property is located in the foothills of the Alaska Range within the Tanana-Kuskokwim Lowland physiographic province. Summit Lake occupies the broad valley to the south, a basin scooped out by glaciers and damned by alluvial debris deposited by Falls Creek at the basin's north end. Based upon the topographic map of the Mt Hayes Quadrangle, the site elevation is approximately 2800 feet above the mean sea level.

Regional Hydrology

The Delta River is the dominant influence on ground-water flow in the subject area. Two discharge peaks characterize the Delta River: spring snowmelt runoff and summer glacial melt (mid-late July). The stage of nearby water bodies such as Phelan Creek typically rises and falls in response to stage changes of the Delta River. The depth to groundwater varies in response to these controlling factors. Based on interpretation of USGS data, regional groundwater flow direction is generally to the north-northwest. However, the direction of flow may vary depending upon the stage of the Delta River. The seasonal high groundwater table for the surrounding area is unknown at this time.

The subject property is situated approximately 200 feet east of Phelan Creek a tributary to the Delta River and approximately 4 miles north of Summit Lake.

Site Hydrology

Groundwater was encountered at approximately 4 - 4.5 feet bgs in all boreholes during the subsurface investigation at Milepost 205 Richardson Highway. The regional water table was considered normal for the time of year. Based on groundwater data from nearby monitoring wells, the groundwater direction flows 5.5 degrees west of north with a fairly steep hydraulic gradient (0.0088 vertical ft/horizontal ft).

GROUNDWATER SAMPLING

Scope of Work

To achieve the stated objectives, ARES performed the following tasks:

- Collected groundwater samples from monitoring wells MW-1 through MW-6. A duplicate sample from MW-2 was collected for QA/QC purposes.

Samples were analyzed for diesel range organics (DRO) by method AK 102 and benzene, toluene, ethylbenzene and xylenes (BTEX) constituents by method EPA 8260B; and

- Data review and report preparation.

Sampling Method

The monitoring well was developed, purged and sampled in accordance with the UST Procedures Manual and standard procedures. A disposable polyethylene bailer and new nitrile gloves were used during the sampling event. Before sampling, the groundwater elevation was measured to 0.010 feet using a Heron Model D-T Interface Meter. Well volume was then calculated, and at least three times the well volume was purged prior to sampling. Recharge rates were observed during purging, and water levels measurements taken following sampling. Water parameters were recorded to include temperature, pH, conductivity, turbidity, dissolved oxygen, and salinity using a Horiba Water Meter Model U-10.

Once well was sufficiently recharged and groundwater parameters stabilized, samples were collected in order of decreasing volatility. The bailers were carefully lowered in to the well to avoid loss of volatiles and water collected from the bailers was placed directly into lab supplied sample bottles. Volatile samples were collected to avoid any headspace in the bottle. All bottles were labeled and placed in a pre-chilled cooler (at approximately 4°C) and submitted to ADEC approved laboratory following chain of custody (COC) procedures.

Purge water was placed in drums and stored at an off-site location pending laboratory results. Groundwater samples were collected from MW-1 through MW-6 on September 23, 2012. A blind duplicate sample was collected from monitoring well MW-2 for quality assurance/quality control purposes.

Field Observations

There was a diesel odor and visible sheen observed in groundwater collected from monitoring well MW-1 and MW-4 during sampling activities. Purge water was almost clear in appearance. Groundwater was approximately 4’ below ground surface at the time of sampling.

Analytical Results

The monitoring wells were sampled and analyzed for DRO by method AK102 and BTEX by method EPA 8021B. A summary of recent groundwater analytical results are shown in Table 1 (monitoring wells MW1 - MW3) and Table 2 (monitoring wells MW4 - MW6). The summary tables also include historical analytical results for comparative purposes with the current sampling event. Complete laboratory results are included in Appendix B. Analytical results indicate that MW-1 and MW-4 remain above ADEC target cleanup levels for DRO. All other results for all other analyses indicate either values below ADEC cleanup or non-detectable at reporting limits. All applicable reporting limits are below ADEC target cleanup levels for all tested analytes.

Table 1
Historical Groundwater Analytical Results Summary
Monitoring Wells MW1 - MW3

(Results shown as mg/L)

Sample Location	Sample ID	Date Sampled	EPA Method 8021B				Alaska Method AK 102
			Benzene in mg/L	Toluene in mg/L	Ethyl-benzene in mg/L	Total xylenes in mg/L	DRO in mg/L
MW-1	MW1-0309	03/24/09	ND	0.598	0.204	1.190	**5.23**
	MW1-0909	10/04/09	**0.0461**	.0284	0.120	0.843	**46.7**
	MW1-0910	09/25/10	0.00142	0.0439	0.0551	0.266	**126**
	MW1-0711	07/20/11	0.000610	0.0125	0.0210	0.291	**59.8**
	MW1-0912	09/23/12	ND	0.0132	.0109	0.1311	**3.19**
MW-2	MW2-0309	03/24/09	0.00120	0.0166	0.00540	.0475	0.471
	DUP-W-0309 Blind Field Duplicate Sample to MW2-0309	03/24/09	.00137	.0181	.00601	.0505	ND
	MW2-0909	10/04/09	ND	.0266	.0528	.388	**1210**
	MWDUP-0909 Blind Field Duplicate Sample to MW2-0909	10/04/09	ND	.0228	.0503	.373	**555**
	MW2-0910	09/25/10	ND	ND	0.00223	0.0218	**27.1**
	MW2-0711	07/20/11	ND	ND	ND	ND	**9.14**
	MW2-0912	09/23/12	ND	ND	ND	ND	0.725
	DUP-W-0912 Blind Field Duplicate Sample to MW2-0912	09/23/12	ND	ND	ND	ND	0.454
MW-3	MW3-0309	03/24/09	ND	ND	ND	ND	ND
	MW3-0909	10/04/09	ND	ND	ND	ND	0.725
	MW3-0910	09/25/10	ND	ND	ND	ND	ND
	MW3-0711	07/20/11	ND	ND	ND	ND	ND
	DUP-W-0711 Blind Field Duplicate Sample to MW3-0711	07/20/11	ND	ND	ND	ND	ND
	MW3-0912	09/23/12	ND	ND	ND	ND	0.0154
ADEC Cleanup Level [1]			0.005	1.0	0.7	10.0	1.5

Results above ADEC cleanup levels are **highlighted and bold**.

[1] Title 18 of the Alaska Administrative Code, Chapter 75. Section 345. Table C.

ND= Not detected at the MRL (Method Reporting Limit).

N/A = Not Analyzed.

Results above ADEC Regulatory Limit in Bold.

Table 2
Historical Groundwater Analytical Results Summary
Monitoring Wells MW4 - MW6
(Results shown as mg/L)

Sample Location	Sample ID	Date Sampled	EPA Method 8021B				Alaska Method AK 102
			Benzene in mg/L	Toluene in mg/L	Ethyl-benzene in mg/L	Total xylenes in mg/L	DRO in mg/L
MW-4	MW4-0309	03/24/09	0.000610	0.00616	0.00231	0.0102	ND
	MW4-0909	10/04/09	ND	0.00563	0.0283	.224	**108**
	MW4-0910	09/25/10	ND	ND	ND	0.00759	**14.1**
	MW4-0711	07/20/11	ND	ND	ND	ND	**6.84**
	MW4-0912	09/23/12	ND	ND	ND	ND	**2.39**
MW-5	MW5-0309	03/24/09	ND	ND	ND	ND	ND
	MW5-0909	10/04/09	ND	ND	ND	ND	ND
	MW5-0910	09/25/10	ND	ND	ND	ND	ND
	DUP Blind Field Duplicate Sample to MW5-0910	09/25/10	ND	ND	ND	ND	ND
	MW5-0711	07/20/11	ND	ND	ND	ND	ND
	MW5-0912	09/23/12	ND	ND	ND	ND	ND
MW-6	MW6-0309	03/24/09	ND	ND	ND	ND	ND
	MW6-0909	10/04/09	ND	ND	ND	ND	ND
	MW6-0910	09/25/10	ND	ND	ND	ND	ND
	MW6-0711	07/20/11	ND	ND	ND	ND	ND
	MW6-0912	09/23/12	ND	ND	ND	ND	ND
ADEC Cleanup Level [1]			0.005	1.0	0.7	10.0	1.5

Results above ADEC cleanup levels are **highlighted and bold**.
[1] Title 18 of the Alaska Administrative Code, Chapter 75. Section 345. Table C.
ND= Not detected at the MRL (Method Reporting Limit).
N/A = Not Analyzed.
Results above ADEC Regulatory Limit in Bold.

Blind Duplicate Samples

Field quality control (QC) procedures for this project included the collection and analysis of a field duplicate. One field duplicate (DUP-W-0912) was collected for quality control purposes. Sample ID DUP-W-0912 was a blind duplicate to MW2-0912. The QC sample was analyzed to assess the quality of sample collection and handling, as well as the accuracy and precision of the laboratory's analytical procedures.

Relative percent difference (RPD) calculations provide a comparison of two theoretically identical samples that are submitted blind to the laboratory in order to provide an un-biased measure of precision. Due to the nature of the RPD calculation, sample data for both samples must be reported in order for the RPD calculation to provide meaningful data. RPD calculations are computed in for all compounds that had laboratory reported detections above the MRL for both samples.

RPD calculations were only possible for DRO due to non-detect values for all other tested analytes in the original sample and the duplicate sample.

Table 3: Relative Percent Difference Calculations

Sample ID / Duplicate ID	Compound	Sample Concentration (mg/L)	Duplicate Concentration (mg/L)	RPD
DUP-W-0912 / MW2-0912 (Water)	DRO	0.725	0.454	**46.0%**

Given two sample concentrations (X and Y) the formula to determine RPD is the absolute value of the following:
[((X - Y) / (X + Y)) / 2] * 100 = RPD
Results above ADEC recommended range in **Bold**.

The ADEC recommended limit for RPD is 30% in water. The calculated RPD for DRO was 46.0% above the ADEEC limit of 30.0% in water. Due to this error data from this sampling event should be viewed qualitatively rather than quantitatively.

Trip Blank Samples

Field quality control (QC) procedures for this project included the analysis of one water trip blank sample which accompanied the samples in the field. The trip blank sample was analyzed to assess the quality of sample collection and handling.

In ideal conditions the analysis of a trip blank sample should not indicate the presence of any of the tested analytes in a quantity above the method reporting limit (MRL). A result above the MRL can indicate that cross-contamination occurred between samples during sample transport or analysis, or indicate laboratory contamination.

Trip blank samples were analyzed for all volatile analysis including EPA 8260.

No analytes were detected above the MRL in the analyzed trip blank samples. No impact on data quality or usability is expected due to trip blank analyses.

Quality Assurance / Quality Control

The ADEC Environmental Laboratory Data Quality Assurance Requirements (ADEC 2006) and United States Environmental Protection Agency (EPA) National Functional Guidelines for Organic Review (EPA 1999) were followed in this site investigation. The data were reviewed to determine the data quality and to evaluate potential impact on the usability of the data. The review was performed using Level II reports that were provided by Test America, Inc. laboratory of Anchorage, AK. The analytical laboratory repots and chain-of-custody records is included in Appendix B.

A complete set of quality control parameters were reviewed as listed below.

- Holding times
- Sample handling and receiving
- Surrogate percent recovery
- Field duplicate sample comparability

- Matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD)
- Laboratory control sample (LCS)/Laboratory control sample duplicate (LCSD) percent recoveries and RPD
- Method blanks
- Trip blanks
- Method Sensitivity – reporting limits and practical quantitation limits (PQL)

Laboratory Report Number: 1209021

All quality control parameters were reviewed and met quality control standards for this analytical sampling event.

Precision, expressed as the relative percent difference (RPD) between field duplicate sample results, is an indication of the consistency of sampling, sample handling, preservation, and laboratory analysis. As required by the 18AAC 78 and the UST Procedures Manual, field quality control sampling consisted of 10% field duplicates and 5% trip blanks. The RPD's for duplicates collected as part of this investigation were within limits for DRO but not calculable for all other analytes .

Analysis of the trip blanks showed no analytes above the practical quantitation limit (PQL). Thus, there is no indication that cross-contamination among samples occurred.

Laboratory quality assurance included the procedures outlined in the laboratory's ADEC-approved standard operating procedures documentation. As presented in the laboratory report's QC summary sheet, the laboratory QC parameters fell within the acceptable limits.

Conclusions and Recommendations

Monitoring wells MW-1 and MW-4 remain above groundwater cleanup levels for DRO. There appears to be a significant decrease in level of DRO in groundwater, this may however be attributed to fluctuating groundwater conditions. Subsequent sampling events will verify if the contaminant plume is decreasing.

ARES recommends the following:

- Annual sampling of wells MW-1 through MW-6 should continue during period of high seasonal groundwater conditions (Fall) for DRO and BTEX analysis. Groundwater results will be used for trend analysis to determine if the plume has stabilized or is in a decreasing or increasing trend.

Limitations

This report presents the analytical results from a limited number of groundwater samples, and should not be construed as a comprehensive study of groundwater quality at the site. The samples were intended to evaluate the presence or absence of contaminants at the locations selected. Detectable levels of petroleum hydrocarbons may be present at other locations. It was also not the intent of our sampling and testing to detect the presence of

groundwater affected by contaminants other than those for which laboratory analysis were preformed. No conclusions can be drawn on the presence or absence of other contaminants. This is not a geotechnical study.

The data presented in this report should be considered representative of the time of our site observations and sample collection. Changes in site conditions can occur with time because of natural forces or human activity. ARES reserves the right to modify or alter conclusions and recommendations should additional data become available.

This report was prepared for the exclusive use of Big State Logistics Inc., and their representatives. If it is made available to others, it should be for information on factual data only and not as a warranty of subsurface conditions.

Qualifications & Signature of Environmental Professional

Lyle Gresehover is an ADEC 'Qualified Person' and has extensive field experience as an environmental project manager and has worked on all aspects of environmental assessments, investigations, and clean-up efforts.

Lyle Gresehover
Project Manager

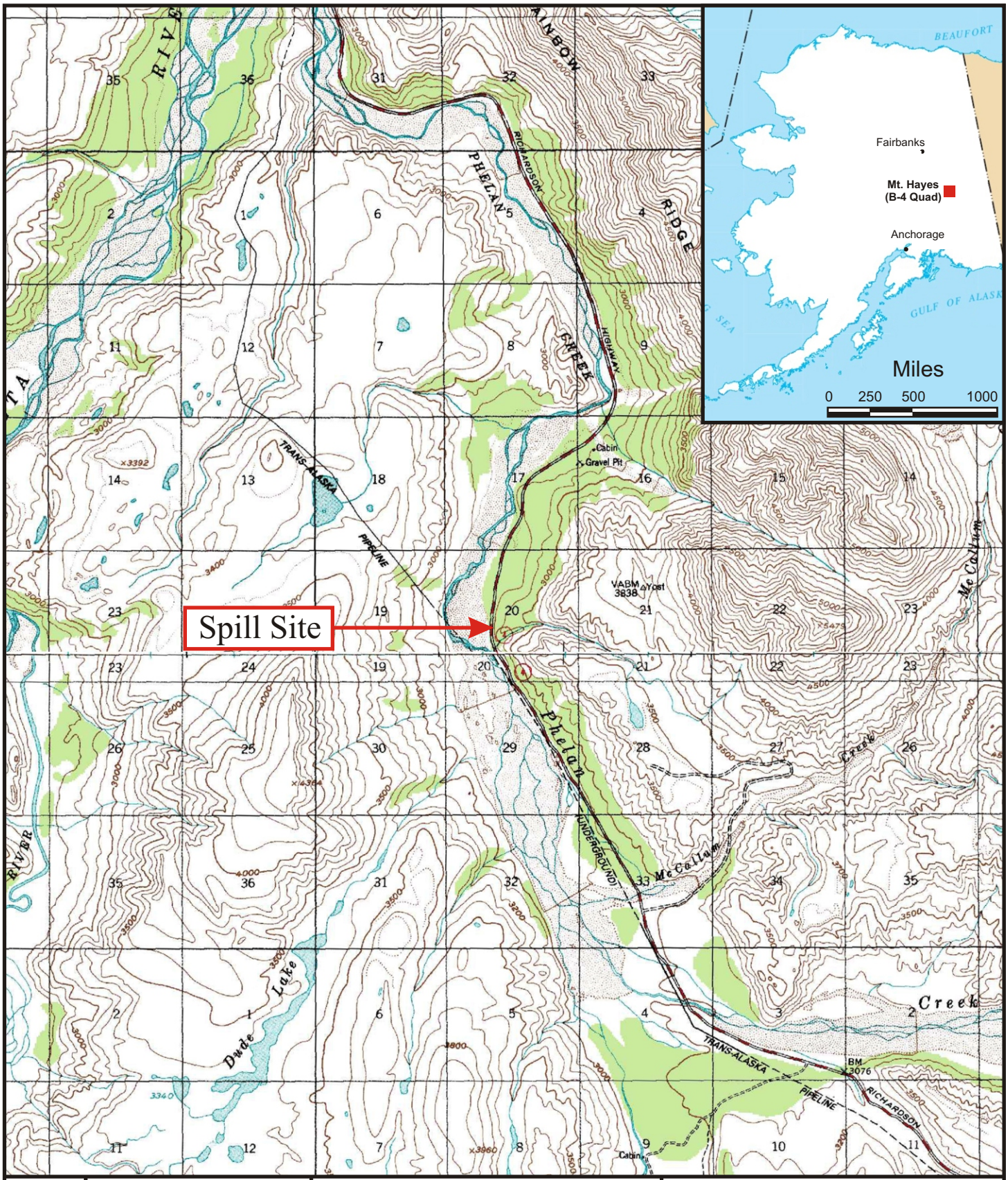
Sincerely,

Lyle Gresehover
Alaska Resources and Environmental Services, LLC

Enclosure: Appendix A – Figure 1 (Area map), Figure 2 (Well location map).
Appendix B – Alaska Analytical laboratory results and ADEC QA/QC analytical lab checklist.

Appendix A

Figures

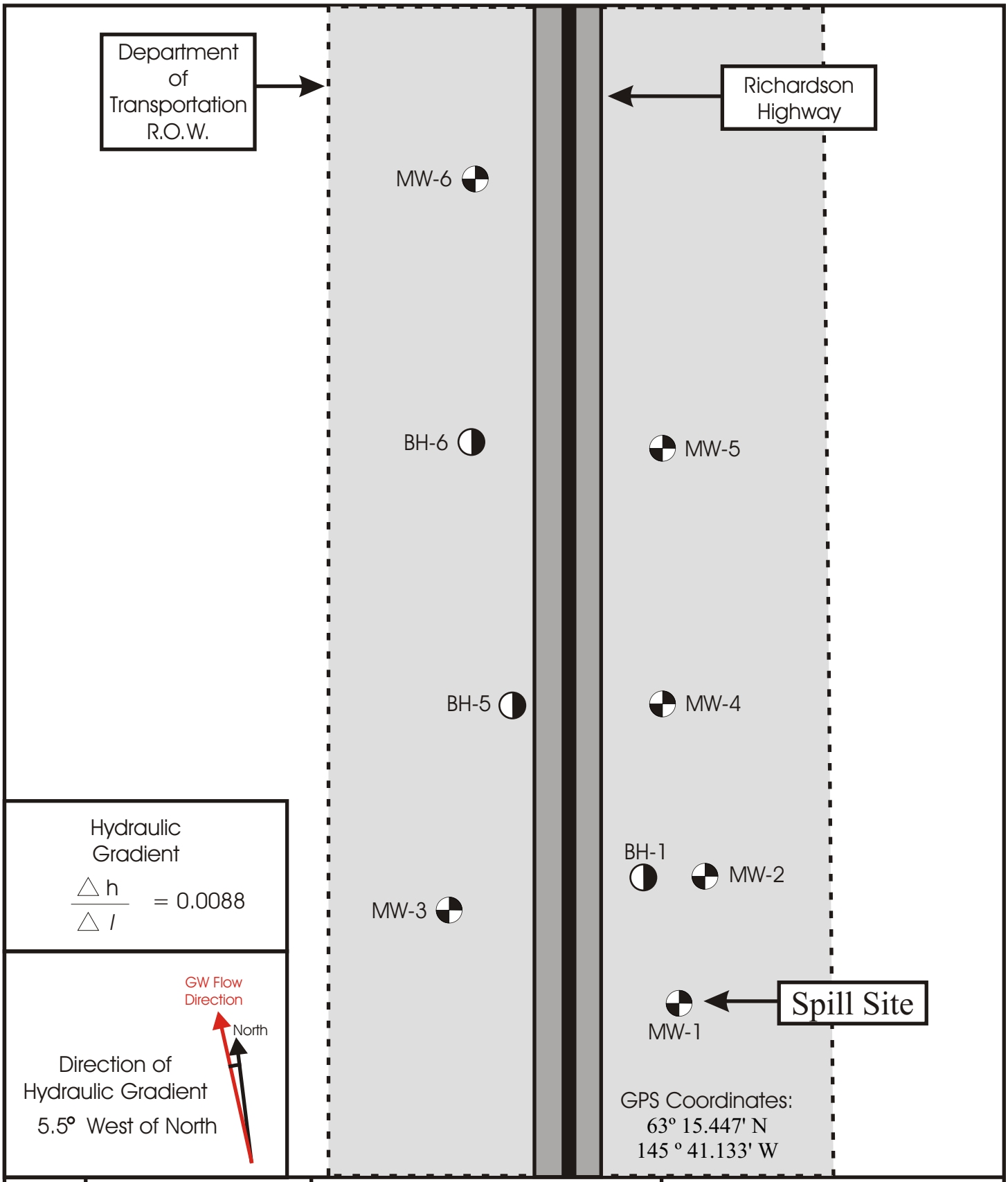


1954 Topo Map
Mt. Hayes, Alaska
Quad B-4

September 2012
Groundwater Monitoring Report
Mile 205 Richardson Hwy.
Summit Lake, Alaska

FIGURE 1

ARES
Alaska Resources and Environmental Services, LLC
284 Topside
Fairbanks AK 99701



MW / Borehole Location Map

September 2012 Groundwater Monitoring Report
Mile 205 Richardson Hwy.
Summit Lake, Alaska

FIGURE 2

ARES
Alaska Resources and Environmental Services, LLC
284 Topside
Fairbanks AK 99701

Appendix B

Analytical Results & Lab Data Review Checklist

Alaska Analytical Laboratory
1956 Richardson Highway
North Pole, Alaska 99705
TEL: (907) 488-1271 FAX: (907) 488-0772
Website: www.alaska-analytical.com

October 08, 2012

Lyle Greshover
Alaska Resources and Environmental Services
P.O. Box 83050
Fairbanks, Alaska 99708
TEL: (907) 374-3226
FAX: (907) 374-3219

RE: 205 Richardson Hwy. Order No.: 1209021

Dear Lyle Greshover:

Alaska Analytical Laboratory received 8 sample(s) on 9/24/2012 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results designated with a "J" qualifier are estimated and represent a detection above the Method Detection Limit (MDL) and less than the Reporting Limit (PQL). These analytes are not reviewed nor narrated as to whether they are laboratory artifacts.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Kelley Lovejoy

Kelley Lovejoy
Chief Chemist
1956 Richardson Highway
North Pole, Alaska 99705

Alaska Analytical Laboratory
1956 Richardson Highway
North Pole, Alaska 99705
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Website: www.alaska-analytical.com

Case Narrative

WO#: **1209021**
Date: **10/8/2012**

CLIENT: Alaska Resources and Environmental Servi
Project: 205 Richardson Hwy.

This report in its entirety consists of the documents listed below. All documents contain the Alaska Analytical Laboratory Work Order Number assigned to this report.

1. Paginated Report including: Case Narrative, Analytical Results and Applicable Quality Control Summary Reports.

2. A Cover Letter that immediately precedes the Paginated Report.

Concentrations reported with a J flag in the Qual field are values below the reporting limit (RL) but greater than the established method detection limit (MDL). There is greater uncertainty associated with these results and data should be considered as estimated.

Concentrations reported with an E flag in the Qual field are values that exceed the upper quantification range. There is greater uncertainty associated with these results and data should be considered as estimated.

Any comments or problems with the analytical events associated with this report are noted below.

Alaska Analytical Laboratory
1956 Richardson Highway
North Pole, Alaska 99705
TEL: (907) 488-1271 FAX: (907) 488-0772
Website: www.alaska-analytical.com

Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 10:47:00 AM

Project: 205 Richardson Hwy.

Lab ID: 1209021-001 **Matrix:** WATER

Client Sample ID MW1-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	3.19	0.270		mg/L	2	10/6/2012 10:05:28 PM
Surr: o-Terphenyl	62.9	50-150		%REC	2	10/6/2012 10:05:28 PM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 12:10:47 AM
Ethylbenzene	10.9	5.00		µg/L	1	10/3/2012 12:10:47 AM
m,p-Xylene	38.3	5.00		µg/L	1	10/3/2012 12:10:47 AM
o-Xylene	92.8	5.00		µg/L	1	10/3/2012 12:10:47 AM
Toluene	13.2	5.00		µg/L	1	10/3/2012 12:10:47 AM
Surr: 4-Bromofluorobenzene	90.5	50-150		%REC	1	10/3/2012 12:10:47 AM
Surr: a,a,a-trifluorotoluene	107	50-150		%REC	1	10/3/2012 12:10:47 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 12:01:00 PM

Project: 205 Richardson Hwy.

Lab ID: 1209021-002 **Matrix:** WATER

Client Sample ID MW2-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	0.725	0.135		mg/L	1	10/6/2012 10:35:47 PM
Surr: o-Terphenyl	112	50-150		%REC	1	10/6/2012 10:35:47 PM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 1:02:37 AM
Ethylbenzene	ND	5.00		µg/L	1	10/3/2012 1:02:37 AM
m,p-Xylene	ND	5.00		µg/L	1	10/3/2012 1:02:37 AM
o-Xylene	ND	5.00		µg/L	1	10/3/2012 1:02:37 AM
Toluene	ND	5.00		µg/L	1	10/3/2012 1:02:37 AM
Surr: 4-Bromofluorobenzene	92.9	50-150		%REC	1	10/3/2012 1:02:37 AM
Surr: a,a,a-trifluorotoluene	106	50-150		%REC	1	10/3/2012 1:02:37 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 1:19:00 PM

Project: 205 Richardson Hwy.

Lab ID: 1209021-003 **Matrix:** WATER

Client Sample ID MW3-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	0.0154	0.135	J	mg/L	1	10/6/2012 11:07:08 PM
Surr: o-Terphenyl	104	50-150		%REC	1	10/6/2012 11:07:08 PM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 1:54:30 AM
Ethylbenzene	ND	5.00		µg/L	1	10/3/2012 1:54:30 AM
m,p-Xylene	ND	5.00		µg/L	1	10/3/2012 1:54:30 AM
o-Xylene	ND	5.00		µg/L	1	10/3/2012 1:54:30 AM
Toluene	ND	5.00		µg/L	1	10/3/2012 1:54:30 AM
Surr: 4-Bromofluorobenzene	96.2	50-150		%REC	1	10/3/2012 1:54:30 AM
Surr: a,a,a-trifluorotoluene	108	50-150		%REC	1	10/3/2012 1:54:30 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Website: www.alaska-analytical.com

Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 2:34:00 PM

Project: 205 Richardson Hwy.

Lab ID: 1209021-004 **Matrix:** WATER

Client Sample ID MW4-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	2.39	0.135		mg/L	1	10/6/2012 11:37:30 PM
Surr: o-Terphenyl	114	50-150		%REC	1	10/6/2012 11:37:30 PM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 2:20:24 AM
Ethylbenzene	ND	5.00		µg/L	1	10/3/2012 2:20:24 AM
m,p-Xylene	ND	5.00		µg/L	1	10/3/2012 2:20:24 AM
o-Xylene	ND	5.00		µg/L	1	10/3/2012 2:20:24 AM
Toluene	ND	5.00		µg/L	1	10/3/2012 2:20:24 AM
Surr: 4-Bromofluorobenzene	97.8	50-150		%REC	1	10/3/2012 2:20:24 AM
Surr: a,a,a-trifluorotoluene	109	50-150		%REC	1	10/3/2012 2:20:24 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 3:55:00 PM

Project: 205 Richardson Hwy.

Lab ID: 1209021-005 **Matrix:** WATER

Client Sample ID MW5-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	ND	0.135		mg/L	1	10/7/2012 12:07:57 AM
Surr: o-Terphenyl	91.8	50-150		%REC	1	10/7/2012 12:07:57 AM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 2:46:23 AM
Ethylbenzene	ND	5.00		µg/L	1	10/3/2012 2:46:23 AM
m,p-Xylene	ND	5.00		µg/L	1	10/3/2012 2:46:23 AM
o-Xylene	ND	5.00		µg/L	1	10/3/2012 2:46:23 AM
Toluene	ND	5.00		µg/L	1	10/3/2012 2:46:23 AM
Surr: 4-Bromofluorobenzene	96.0	50-150		%REC	1	10/3/2012 2:46:23 AM
Surr: a,a,a-trifluorotoluene	107	50-150		%REC	1	10/3/2012 2:46:23 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 5:12:00 PM

Project: 205 Richardson Hwy.

Lab ID: 1209021-006 **Matrix:** WATER

Client Sample ID MW6-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	ND	0.135		mg/L	1	10/7/2012 12:39:00 AM
Surr: o-Terphenyl	94.8	50-150		%REC	1	10/7/2012 12:39:00 AM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 3:12:17 AM
Ethylbenzene	ND	5.00		µg/L	1	10/3/2012 3:12:17 AM
m,p-Xylene	ND	5.00		µg/L	1	10/3/2012 3:12:17 AM
o-Xylene	ND	5.00		µg/L	1	10/3/2012 3:12:17 AM
Toluene	ND	5.00		µg/L	1	10/3/2012 3:12:17 AM
Surr: 4-Bromofluorobenzene	96.6	50-150		%REC	1	10/3/2012 3:12:17 AM
Surr: a,a,a-trifluorotoluene	108	50-150		%REC	1	10/3/2012 3:12:17 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:** 9/23/2012 6:38:00 PM

Project: 205 Richardson Hwy.

Lab ID: 1209021-007 **Matrix:** WATER

Client Sample ID Dup-W-0912

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
AK102SVW				**AK102**	**SW3510**	Analyst: **KL**
Diesel Range Organics C10-C25	0.454	0.135		mg/L	1	10/7/2012 1:09:40 AM
Surr: o-Terphenyl	89.6	50-150		%REC	1	10/7/2012 1:09:40 AM
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/3/2012 3:38:14 AM
Ethylbenzene	ND	5.00		µg/L	1	10/3/2012 3:38:14 AM
m,p-Xylene	ND	5.00		µg/L	1	10/3/2012 3:38:14 AM
o-Xylene	ND	5.00		µg/L	1	10/3/2012 3:38:14 AM
Toluene	ND	5.00		µg/L	1	10/3/2012 3:38:14 AM
Surr: 4-Bromofluorobenzene	96.4	50-150		%REC	1	10/3/2012 3:38:14 AM
Surr: a,a,a-trifluorotoluene	108	50-150		%REC	1	10/3/2012 3:38:14 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

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Analytical Report

(consolidated)

WO#: **1209021**

Date Reported: **10/8/2012**

CLIENT: Alaska Resources and Environmental Services **Collection Date:**

Project: 205 Richardson Hwy.

Lab ID: 1209021-008 **Matrix:** WATER

Client Sample ID Trip Blank

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS				**AK101**		Analyst: **KL**
Benzene	ND	5.00		µg/L	1	10/2/2012 10:52:31 PM
Ethylbenzene	ND	5.00		µg/L	1	10/2/2012 10:52:31 PM
m,p-Xylene	ND	5.00		µg/L	1	10/2/2012 10:52:31 PM
o-Xylene	ND	5.00		µg/L	1	10/2/2012 10:52:31 PM
Toluene	ND	5.00		µg/L	1	10/2/2012 10:52:31 PM
Surr: 4-Bromofluorobenzene	96.2	50-150		%REC	1	10/2/2012 10:52:31 PM
Surr: a,a,a-trifluorotoluene	109	50-150		%REC	1	10/2/2012 10:52:31 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit
PL	Permit Limit	RL	Reporting Detection Limit
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QC SUMMARY REPORT

WO#: **1209021**

08-Oct-12

Client: Alaska Resources and Environmental Services
Project: 205 Richardson Hwy. **TestCode:** **AK101W**

Sample ID: **MB-R636**	SampType: **MBLK**	TestCode: **AK101W**	Units: **µg/L**	Prep Date:	RunNo: **636**
Client ID: **PBW**	Batch ID: **R636**	TestNo: **AK101**		Analysis Date: **10/2/2012**	SeqNo: **6209**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	5.00									
Ethylbenzene	ND	5.00									
m,p-Xylene	ND	5.00									
o-Xylene	ND	5.00									
Toluene	ND	5.00									
Surr: 4-Bromofluorobenzene	48.4		50.00		96.8	60	120				
Surr: a,a,a-trifluorotoluene	53.6		50.00		107	60	120				

Sample ID: **LCS-R636**	SampType: **LCS**	TestCode: **AK101W**	Units: **µg/L**	Prep Date:	RunNo: **636**
Client ID: **LCSW**	Batch ID: **R636**	TestNo: **AK101**		Analysis Date: **10/2/2012**	SeqNo: **6218**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	59.0	5.00	50.00	0	118	60	120				
Ethylbenzene	52.0	5.00	50.00	0	104	60	120				
m,p-Xylene	99.3	5.00	100.0	0	99.3	60	120				
o-Xylene	50.3	5.00	50.00	0	101	60	120				
Toluene	52.9	5.00	50.00	0	106	60	120				
Surr: 4-Bromofluorobenzene	46.8		50.00		93.5	60	120				
Surr: a,a,a-trifluorotoluene	54.0		50.00		108	60	120				

Sample ID: **LCSD-R636**	SampType: **LCSD**	TestCode: **AK101W**	Units: **µg/L**	Prep Date:	RunNo: **636**
Client ID: **LCSS02**	Batch ID: **R636**	TestNo: **AK101**		Analysis Date: **10/2/2012**	SeqNo: **6219**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	58.9	5.00	50.00	0	118	60	120	58.96	0.102	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Value above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1209021**

08-Oct-12

Client: Alaska Resources and Environmental Services

Project: 205 Richardson Hwy. **TestCode:** **AK101W**

Sample ID: **LCSD-R636**	SampType: **LCSD**	TestCode: **AK101W**	Units: **µg/L**	Prep Date:	RunNo: **636**
Client ID: **LCSS02**	Batch ID: **R636**	TestNo: **AK101**		Analysis Date: **10/2/2012**	SeqNo: **6219**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Ethylbenzene	51.8	5.00	50.00	0	104	60	120	52.04	0.443	20	
m,p-Xylene	99.2	5.00	100.0	0	99.2	60	120	99.31	0.0705	20	
o-Xylene	50.1	5.00	50.00	0	100	60	120	50.33	0.478	20	
Toluene	52.9	5.00	50.00	0	106	60	120	52.91	0.0189	20	
Surr: 4-Bromofluorobenzene	46.7		50.00		93.5	60	120		0	0	
Surr: a,a,a-trifluorotoluene	55.2		50.00		110	60	120		0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Value above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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QC SUMMARY REPORT

WO#: **1209021**

08-Oct-12

Client: Alaska Resources and Environmental Services
Project: 205 Richardson Hwy. **TestCode:** **AK102SVW**

Sample ID: **LCS-318**	SampType: **LCS**	TestCode: **AK102SVW**	Units: **mg/L**	Prep Date: **10/2/2012**	RunNo: **642**
Client ID: **LCSW**	Batch ID: **318**	TestNo: **AK102**	**SW3510**	Analysis Date: **10/6/2012**	SeqNo: **6184**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics C10-C25	2.30	0.135	2.500	0	92.0	75	125				
Surr: Octacosane	0.0539		0.05000		108	60	120				
Surr: o-Terphenyl	0.0514		0.05000		103	60	120				

Sample ID: **LCSD-318**	SampType: **LCSD**	TestCode: **AK102SVW**	Units: **mg/L**	Prep Date: **10/2/2012**	RunNo: **642**
Client ID: **LCSS02**	Batch ID: **318**	TestNo: **AK102**	**SW3510**	Analysis Date: **10/6/2012**	SeqNo: **6185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics C10-C25	2.38	0.135	2.500	0	95.0	75	125	2.300	3.25	20	
Surr: Octacosane	0.0570		0.05000		114	60	120		0	0	
Surr: o-Terphenyl	0.0526		0.05000		105	60	120		0	0	

Sample ID: **MB-318**	SampType: **MBLK**	TestCode: **AK102SVW**	Units: **mg/L**	Prep Date: **10/2/2012**	RunNo: **642**
Client ID: **PBW**	Batch ID: **318**	TestNo: **AK102**	**SW3510**	Analysis Date: **10/6/2012**	SeqNo: **6186**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics C10-C25	0.0170	0.135									J
Surr: Octacosane	0.0590		0.05000		118	60	120				
Surr: o-Terphenyl	0.0496		0.05000		99.1	60	120				

Qualifiers:

*	Value exceeds Maximum Contaminant Level	E	Value above quantitation range	H	Holding times for preparation or analysis exceede
M	Manual Integration used to determine area response	ND	Not Detected at the Method Detection Limit	P	Second column confirmation exceeds
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit	S	Spike Recovery outside accepted recovery limits

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Sample Receipt Checklist

Client Name: **ARES01** Work Order Number **1209021**

RcptNo: **1** Date and Time Received: **9/24/2012 11:45:40 AM** Received by: **Kelley Lovejoy**

Completed by: Kelley Lovejoy Reviewed by: Kelley Lovejoy

Completed Date: 9/25/2012 10:36:38 AM Reviewed Date: 9/25/2012 10:36:41 AM

Carrier name: Client

Chain of custody present?	Yes	☑	No	☐		
Chain of custody signed when relinquished and received?	Yes	☑	No	☐		
Chain of custody agrees with sample labels?	Yes	☑	No	☐	Not Present	☐
Are matrices correctly identified on Chain of custody?	Yes	☑	No	☐		
Is it clear what analyses were requested?	Yes	☑	No	☐		
Custody seals intact on sample bottles?	Yes	☐	No	☐	Not Present	☑
Samples in proper container/bottle?	Yes	☑	No	☐		
Were correct preservatives used and noted?	Yes	☑	No	☐		
Sample containers intact?	Yes	☑	No	☐		
Sufficient sample volume for indicated test?	Yes	☑	No	☐		
Were container lables complete (ID, Pres, Date)?	Yes	☑	No	☐		
All samples received within holding time?	Yes	☑	No	☐		
Was an attempt made to cool the samples?	Yes	☑	No	☐		
All samples received at a temp. of > 0° C to 6.0° C?	Yes	☑	No	☐		
Response when temperature is outside of range:						
Preservative added to bottles:						
Sample Temp. taken and recorded upon receipt?	Yes	☑	No	☐	0.9 To	0.9 º
Water - Were bubbles absent in VOC vials?	Yes	☑	No	☐	No Vials	☐
Water - Was there Chlorine Present?	Yes	☐	No	☐	NA	☑
Water - pH acceptable upon receipt?	Yes	☑	No	☐	No Water	☐
Are Samples considered acceptable?	Yes	☑	No	☐		
Custody Seals present?	Yes	☑	No	☐		
Traffic Report or Packing Lists present?	Yes	☐	No	☑		
Airbill or Sticker?	Air Bill	☑	Sticker	☐	Not Present	☐
Airbill No:						
Sample Tags Present?	Yes	☐	No	☑		
Sample Tags Listed on COC?	Yes	☐	No	☑		
Tag Numbers:						
Sample Condition?	Intact	☑	Broken	☐	Leaking	☐

Case Number: SDG: SAS:

Cooler Information

Cooler No	Temp ºC	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes		9/26/2012	Lyle Greshover

Adjusted? _____ Checked by _____

Any No and/or NA (not applicable) response must be detailed in the comments section below.

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Sample Receipt Checklist

Client Name: **ARES01**

Work Order Number **1209021**

Client Contacted? ☐ Yes ☑ No ☐ NA Person Contacted:

Contact Mode: ☐ Phone: ☐ Fax: ☐ Email: ☐ In Person:

Client Instructions:

Date Contacted: Contacted By:

Regarding:

CorrectiveAction:

Comments:

Was an attempt made to cool the sample? The lab did not attempt to cool the samples. Samples were received with gel ice in the cooler. Temp. Blank and Cooler were within the ADEC acceptable range.

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Sample Receipt Checklist

Client Name: **ARES01** Work Order Number **1209021**

Sample Details

SampID	ContainerID	Type	Org pH	Adj pH	Req Min pH	Req Max pH
1209021-001A	Container-01 of 02	Bottle				
1209021-001A	Container-02 of 02	Bottle				
1209021-001B	Container-01 of 03	Bottle				
1209021-001B	Container-02 of 03	Bottle				
1209021-001B	Container-03 of 03	Bottle				
1209021-002A	Container-01 of 02	Bottle				
1209021-002A	Container-02 of 02	Bottle				
1209021-002B	Container-01 of 03	Bottle				
1209021-002B	Container-02 of 03	Bottle				
1209021-002B	Container-03 of 03	Bottle				
1209021-003A	Container-01 of 02	Bottle				
1209021-003A	Container-02 of 02	Bottle				
1209021-003B	Container-01 of 03	Bottle				
1209021-003B	Container-02 of 03	Bottle				
1209021-003B	Container-03 of 03	Bottle				
1209021-004A	Container-01 of 02	Bottle				
1209021-004A	Container-02 of 02	Bottle				
1209021-004B	Container-01 of 03	Bottle				
1209021-004B	Container-02 of 03	Bottle				
1209021-004B	Container-03 of 03	Bottle				
1209021-005A	Container-01 of 02	Bottle				
1209021-005A	Container-02 of 02	Bottle				
1209021-005B	Container-01 of 03	Bottle				
1209021-005B	Container-02 of 03	Bottle				
1209021-005B	Container-03 of 03	Bottle				
1209021-006A	Container-01 of 02	Bottle				
1209021-006A	Container-02 of 02	Bottle				
1209021-006B	Container-01 of 03	Bottle				
1209021-006B	Container-02 of 03	Bottle				

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Sample Receipt Checklist

Client Name: **ARES01** Work Order Number **1209021**

1209021-006B	Container-03 of 03	Bottle
1209021-007A	Container-01 of 02	Bottle
1209021-007A	Container-02 of 02	Bottle
1209021-007B	Container-01 of 03	Bottle
1209021-007B	Container-02 of 03	Bottle
1209021-007B	Container-03 of 03	Bottle
1209021-008A	Container-01 of 03	Bottle
1209021-008A	Container-02 of 03	Bottle
1209021-008A	Container-03 of 03	Bottle

Laboratory Data Review Checklist

Completed by: Mark Carpenter

Title: Environmental Scientist Date: 11/21/2012

CS Report Name: BSL 205 Richardson Annual GW Report Report Date: November 2012

Consultant Firm: Alaska Resources and Environmental Services

Laboratory Name: Alaska Analytical Laboratory Report Number: 1209021

ADEC File Number: 140.38.052 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:

      Samples were not transferred or sub-contracted.

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

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

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

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

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

.

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

No discrepancies were noted.

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

N/A; no errors in Laboratory Sample Receipt Documentation were noted.

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 were no discrepancies, errors or QC failures identified in the case narrative.

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

   No corrective actions were necessary.

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

   No effect on data quality/usability was identified in the case narrative.

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

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

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

Water was the matrix for all samples.

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

e. Data quality or usability affected?
Comments:

N/A; all PQLs are less than the ADEC cleanup level.

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:

N/A

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

N/A; all results were less than the PQL.

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

N/A; see above.

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:

No metals or inorganic samples were collected or analyzed for this sampling event.

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

Yes No NA (Please explain.) Comments:

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

Yes No NA (Please explain.) Comments:

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

Comments:

N/A: All %R and RPD's were within acceptable limits.

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

Yes No NA (Please explain.) Comments:

N/A; see above.

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

Comments:

N/A; see above.

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:

All surrogate recoveries were within control limits.

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

Comments:

N/A; see above.

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:

All samples were transported in a single cooler. No unique identifying marks were available on the cooler. Custody seal was intact upon receipt.

iii. All results less than PQL?

Yes No NA (Please explain.) Comments:

iv. If above PQL, what samples are affected?

Comments:

N/A; no samples are affected.

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

Comments:

N/A

e. Field Duplicate

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

Yes No NA (Please explain.) Comments:

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)

RPD (%) = 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.)

Comments:

N/A

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

Yes No NA (Please explain.) Comments:

No equipment blank was required for this sampling event.

i. All results less than PQL?

Yes No NA (Please explain.) Comments:

ii. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

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

a. Defined and appropriate?

Yes No NA (Please explain.) Comments:

AAL COC: 12-0084

AAL Job No. 84

ARES
P.O. Box 83050
Fairbanks, Alaska 99708
Phone: 907.374.3226
Fax: 907.374.2319

ALASKA RESOURCES AND ENVIRONMENTAL SERVICES

Chain of Custody Report

Client: Alaska Resources and Environmental Services

Report To: Lyle Gresehover
Address: ARES, P.O. Box 83050
Email: lyle@ak-res.com
Phone: (907) 374-3226 Fax: (907)374-3219

Invoice To: ARES, P.O. Box 83050, Fairbanks, Alaska 99708

Laboratory Name: Alaska Analytical
Address: 1956 Richardson Hwy, North Pole, AK 99705, (907) 488-1271

P.O. Number:

Project Name: 205 Richardson Hwy.
Project Number:
Sampled By: Lyle Gresehover

Turnaround Request In Business Days

Organic & Inorganic Analyses: 10 | 7 | 5 | 4 | 3 | 2 | 1 | <1

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

Specify Other:

Report Tier Levels: Tier II reporting requested (results + QC)

	Sample Identification	Sampling Date	Time	Preservative: HCL	HCL	Requested Analyses: EPA 8021B BTEX	AK 102 DRO	Matrix (W,S,O)	# of Cont.	Location / Comments	Lab ID
1	MW1-0912	9/23/12	1047			X	X	W	5		
2	MW2-0912	9/23/12	1201			X	X	W	5		
3	MW3-0912	9/23/12	1319			X	X	W	5		
4	MW4-0912	9/23/12	1434			X	X	W	5		
5	MW5-0912	9/23/12	1555			X	X	W	5		
6	MW6-0912	9/23/12	1712			X	X	W	5		
7	Dup-W-0912	9/23/12	1838			X	X	W	5		
8	Trip Blank					X		W	5		
9								0	3		
10											

Released By: [signature]
Print Name: Lyle Gresehover Firm: ARES Date: 9/24/2012 Time: 0615

Received By: Kelley Lovejoy
Print Name: Kelley Lovejoy Firm: AAL Date: 9/24/12 Time: 11:30am

Released By:
Print Name: Firm: Date: Time:

Received By:
Print Name: Firm: Date: Time:

Additional Remarks:

~~Water sample MW1-0711 and MW2-0711~~ is expected to have high levels of DRO/BTEX and may require dilution in order to analyze.

Temp: 0.9°C

Cooler Temp 1.0°C

COC REV 02/2008

ARES01
12-0084
9/24/12