

ALASKA RESOURCES & ENVIRONMENTAL SERVICES, LLC



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Northern Regional Office
Contaminated Sites Program
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**Alaska Home Solutions Property
Release Investigation
November 2007**

Executive Summary

ARES was authorized to perform a release investigation at the request of David Cornwall, owner of Alaska Home Solutions associated with a UST release (100.38.216). The subject property is located at 297 Fifth Avenue, North Pole, Alaska.

Well Survey

A well survey was conducted within a ¼ mile radius of the subject property in order to identify potential receptors. Results of the well survey indicate that there were six (6) confirmed drinking water wells within the search radius and a potential of three (3) additional wells based on information obtained by North Pole City Utilities department. All wells were determined to lie cross-gradient from the source area. In addition, all wells were found to be $\geq 30'$ in depth. It is unlikely that drinking water wells found within the search area would be affected by the petroleum release occurring at the subject property.

Groundwater

Groundwater monitoring wells were installed and samples collected at the source area and down-gradient in order to assess potential impacts to groundwater and to determine if contaminants were migrating off-site.

Analytical results indicate that DRO is above ADEC groundwater cleanup target levels in all monitoring wells. Benzene was found to be above cleanup levels in MW-1 and MW-3. Toluene was found to be above groundwater cleanup levels in MW-1. Groundwater contamination was found to migrate off-site to the west – north. It is anticipated that the contaminant plume leading edge is to the northwest which is the groundwater flow direction. The lateral and horizontal extent of the contaminant plume is undetermined at this time.

A product recovery well was installed at the source area and approximately 75-gallons of free product have been recovered to date. Though collection of free product has diminished, free product is still visible on the water table in the recovery well.

Indoor air

Indoor air samples were collected as part of the investigation to assess potential for indoor air vapor intrusion. Indoor air samples were collected in the building crawl space and interior of the building to obtain representative samples.

Analytical results indicate that vapor intrusion is occurring at the site. Mitigation measures appear to have been successful in reducing indoor air contaminants within the occupied building space to levels below the recommended EPA target levels.

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Based on the above findings ARES recommends the following actions:

- The extent of the contaminant plume is undetermined at this time. Additional off-site groundwater grab samples would need to be collected in order to define the limits of the plume;
- It is recommended that additional on-site groundwater sampling be conducted to determine if the plume is increasing, decreasing, or has reached a state of equilibrium. It is recommended that semi-annual samples be collected during periods of low (spring) and high (fall) water table conditions until the trend can be established;
- Based on levels of benzene and DRO found in groundwater, it is recommended that groundwater cleanup options (both active remediation system and natural attenuation) be evaluated to assess clean up actions required to meet ADEC groundwater cleanup levels;
- Free product recovery should continue until all available free product has been recovered;
- Owner should continue to operate the ventilation system year-round in order to minimize effects of indoor air vapor intrusion;
- It is recommended that indoor air samples be collected following similar format when pressure differential gradient is greatest between the building and subsurface (January/February) to assess adequacy of ventilation system and to determine if further mitigation measures are necessary to reduce indoor air contaminant levels; and
- Contaminated soils still remain on-site. Any disturbance/excavation of soils on the subject property should be field screened and/or sampled to determine if contaminants exceed ADEC target cleanup levels for soil.

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
ARES	Alaska Resources and Environmental Services, LLC
bgs	Below Ground Surface
BTEX	Benzene, Tolulene, Ethylbenzene, Xylenes
COC	Chain of Custody
na	Not Analyzed
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percent Difference
TB	Trip Blank

UNITS OF MEASUREMENT

°C	Degrees Celsius
°F	Degrees Fahrenheit
mg/kg	Milligrams per Kilogram
ppm	Parts per Million
sf	Square Feet
µg/L	Micrograms/Liter

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1.0 INTRODUCTION

This report was prepared on behalf of Alaska Home Solutions who has contracted with Alaska Resources & Environmental Services (ARES) to perform a release investigation associated with the UST release (100.38.216). The work was conducted as detailed in the approved Work Plan submitted in August 2007. This report contains a summary of on-site work and includes field observations and analytical data from sampling activities.

1.1 Purpose

The purpose of this project was to investigate the subsurface conditions at the subject property and more specifically, to determine the extent of groundwater contamination and potential for indoor vapor intrusion associated with a known UST release. Groundwater and indoor air samples were collected as part of the investigation. In addition, a well survey was conducted to identify potential receptors in the vicinity of the release.

Fieldwork described in this report was conducted in accordance with 18 AAC 75 Oil and Other Hazardous Substances Pollution Control, as amended through December 30, 2006 and 18 AAC 78 Underground Storage Tanks as amended through October 27, 2006. ADEC's UST Procedures Manual as amended through January 30, 2003 was used as a guide for standard sampling procedures. Site characterization requirements are provided by ADEC in 18 AAC 75, Articles 3 and 9 Discharge Reporting, Cleanup, and Disposal of Oil and Other Hazardous Substances and General Provisions as amended through December 30, 2006. Soil and water cleanup levels are also provided according to 18 AAC 75. Mr. Lyle Gresehover, Principle Investigator for ARES, conducted the field investigation. Mr. Gresehover is listed as a Qualified Person by the Alaska Department of Environmental Conservation (ADEC) under 18 AAC 78.

1.2 Project Organization/Personnel

Mr. Lyle Gresehover is the point of contact for this project and may be contacted at Alaska Resources & Environmental Services, LLC, P.O. Box 83050 Fairbanks, Alaska 99708. The telephone number for Mr. Gresehover is (907) 374-3226.

Test America, of 2000 W International Airport Road Ste A10, Anchorage, Alaska 99502-1119 performed the laboratory analysis of water samples. Test America is an approved ADEC laboratory for providing analytical services of soil and water for hazardous substances and petroleum related contaminants.

Columbia Analytical of 2665 Park Center Suite D, Simi Valley, CA 93065 performed the laboratory analysis of indoor air samples.

The owner of the property of Mr. David Cornwall of 607 Old Steese Highway, Suite #146 Fairbanks, AK 99701. The telephone number for Mr. Cornwall is (907) 488-8994.

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The release investigation was completed in November 2007, by Mr. Lyle Gresehover Principle Investigator/Geologist for ARES. Mr. Gresehover is listed as a Qualified Person by the Alaska Department of Environmental Conservation (ADEC) under 18 AAC 78. Statement of Qualifications for Mr. Lyle Gresehover is included in Appendix C.

1.3 Scope of Work

In summary Test America, performed the following activities:

- Conducted laboratory analysis of groundwater samples. All samples were analyzed for BTEX using method EPA 8021 B and DRO using method AK 102. Quality control and quality assurance samples were also analyzed.

In summary Columbia Analytical, performed the following activities:

- Conducted laboratory analysis of indoor air samples. All samples were analyzed for BTEX and naphalene using EPA Method TO15. Quality control and quality assurance samples were also analyzed.

In summary ARES performed the following activities:

- ADEC Work Plan submittal;
- Installed product recovery well;
- Installed and developed groundwater monitoring wells;
- Obtained water quality parameter measurements and well elevation data;
- Collection of groundwater samples for laboratory analysis including field duplicates;
- Conducted a well receptor survey;
- Collection of indoor air samples for laboratory analysis;
- Prepared Release Investigation report.

These activities are intended to satisfy requirements listed in 18 AAC 75 for site characterization.

2.0 SITE DESCRIPTION

2.1 Location

The subject property is situated on an approximate 0.30-acre site located west of the Old Richardson Highway and north of Fifth Avenue at 297 Fifth Avenue, North Pole, Alaska (Figure 1). The site is located in the U.S. Geological Survey (USGS) Fairbanks D-1 SW quadrangle. The legal description for the property is as follows: Tax Lot 3A Block 14

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B.V. Davis Homestead out of Lot 3 Block 14 B.V. Davis Homestead, Township 2 South, Range 2 East, Fairbanks Meridian. There are a number of residences and small businesses located in the vicinity of the subject property. The subject property is zoned for commercial use.

2.2 History

ARES was authorized to perform a Site Characterization (groundwater and indoor air assessment) on behalf of Alaska Home Solutions, owner of the subject property. The ADEC file # for the site is 100.38.216.

Records indicate that in November 2006, a UST heating oil tank suspected of leaking was inadvertently filled. It was estimated that approximately 215 gallons of # 2 diesel fuel may have leaked from the tank before being pumped dry one week after filling. During excavation of the tank, approximately 5 gallons of fuel was recovered from the surface of the groundwater. According to NORTECH, who assisted with the tank removal, small holes were visible in the tank upon removal. One soil sample collected from the excavation pit indicated 9 mg/kg benzene, 65,000 mg/kg DRO, and 1,210 mg/kg GRO was present in the soil. There was no indication that contaminated soils were removed during tank removal.

It was also noted that the contaminants most likely extend underneath the building which is located approximately 6' from the source area. Diesel fuel odors were detected in portions of the interior of the building and crawl space during an inspection by ADEC staff and the owner.

The building was last used for commercial purposes of operating a day care center (Circle of Love Day Care).

2.3 Topography, Geology and Hydrogeology

Topography

The United States Geological Survey (USGS) Fairbanks Quadrangle (D-1 SW) provides topographic map coverage of the site. North Pole is located in the northern part of the Tanana Basin, which is a relatively flat floodplain of the Tanana River. The subject property is situated approximately 1.0 miles northeast of the Tanana River. Based upon the topographic map of the Fairbanks Quadrangle, the site elevation is approximately 435 feet above the mean sea level.

Regional Soils/Geology

Soils in the area are derived from the alluvial-plain deposits and generally consist of alternating layers and lenses of unconsolidated sandy gravels and gravely sands, overlain by silt. The well-drained Salchaket soils border the principle rivers in the area and are

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the most extensive soils of the alluvial plains. The site sits on both Salchaket very fine sandy loam and Tanana silt loam soil. The Salchaket soils contain stratified sandy and silty soils over a substratum of water-laid gravel. Tanana soils consist of imperfectly drained soils dominated by silt but may contain lenses of sand at various depths. Discontinuous permafrost underlies the floodplain area and can extend to depths of 200 feet or more. The hills to the north of the site area are part of a metamorphic system that forms the Yukon – Tanana Upland. The basin uplands consist of fractured schist. Areas of discontinuous permafrost underlie north-facing slopes. Eolian silts of the Fairbanks Loess and reworked silt deposits cover the flanks of bedrock uplands in the proximity of the Tanana River. These deposits vary in thickness and grade into alluvial-fan deposits and the Chena Alluvium.

Site Soils

Soils encountered during excavation and installation of product recovery well consisted primarily of light brown silt and silty gravels. No organic layers were observed during excavation activities.

Regional Hydrology

The Tanana River is the dominant influence on ground-water flow in the subject area. Two discharge peaks characterize the Tanana River: spring snowmelt runoff and late summer precipitation. 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 northwest.

Nearby surface water bodies include Beaver Creek (apx. 1,250 feet to the east) and the Tanana River (1.0 miles to the southwest).

Site Hydrology

The groundwater table at the time of sampling was approximately 7' bgs. Well elevation measurements were collected and a closed loop survey conducted to determine groundwater flow direction at the site. It was determined that groundwater flow direction is to the northwest with a fairly flat gradient.

3.0 SOIL SAMPLING

No spoil samples were collected as part of the investigation.

4.0 WELL RECEPTOR SURVEY

4.1 Scope of Work

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A well survey was conducted within a ¼ mile radius of the subject property in order to identify potential receptors (Figure 2).

The following tasks were conducted as part of the well survey:

- Spoke to Mr. Paul Trissel of North Pole City Water Utilities in order to determine potential drinking well locations within a ¼ mile radius of the subject property. The phone number to reach Mr. Paul Trissel is 388-1907;
- Sent a well survey/ notice of possible contamination letter to all developed properties within a ¼ mile radius of the subject property. Property owners' addresses were gathered from the Fairbanks North Star Borough tax records; and
- ARES compiled and interpreted results from the well survey.

4.2 Results of Well Survey

Alaska Resources and Environmental Services found 267 properties within the radius search area. Of these properties, 110 properties had structures on them. ARES sent letters of a well survey/ notice of possible contamination to all 110 property owners. Of these, 50 were non-responsive, 9 were returned (incorrect address), and 51 well survey forms were returned. A sample well survey form is shown in Figure 3.

Based on the information provided by the well survey in addition to North Pole City Utilities, 6 drinking water well locations were discovered within the property search radius. These well locations are summarized in Table 4.2 below.

**Table 4.2
Well Receptor Survey Summary**

Figure 3 Map Identifier	Address	Well Depth	Position relative to subject property
A	Intersection of 5 th Avenue and Snowman Lane. This is the source water well for North Pole City Water	180' bgs	Cross Gradient
B	517 6th Avenue	40'	Cross Gradient
C	504 6th Avenue	40'	Cross Gradient
D	2638 Ford Street	40'	Cross Gradient
E	502 7th Avenue	30' - 40'	Cross Gradient
F	503 7th Avenue	40'	Cross Gradient

Based on conversations with Mr. Paul Trissel manager of North Pole City Water Utilities, three properties were identified as likely having drinking water wells, however they were non-responsive to the well survey. All suspected drinking water wells were found to lie

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cross-gradient from the subject property and were greater than 30' in depth. All known and suspected well locations are shown in Figure 2. According to Mr. Paul Tressel, all properties east of Ford Street within the ¼ mile search radius should be on North Pole City water utilities.

5.0 PRODUCT RECOVERY WELL INSTALLATION

A product recovery well was installed to aid in collection of free product from the water table. The product recovery well consisted of a 12" slotted culvert and was installed to approximately 9' bgs using a backhoe. A heavy sheen was visible on the water table following installation.

Free product removal was accomplished using sorbant boom to manually remove contaminants from the water table. According to the property owner, approximately 75 gallons of free product have been recovered to date. The recovered material is currently being stored on-site in closed 55-gallon drums.

6.0 GROUNDWATER SAMPLING

6.1 Installation of Monitoring Wells

In order to determine extent of contamination and assess potential impacts to groundwater at the site, ARES installed three permanent monitoring wells, MW-1, MW-2, and MW-3 at the subject property. The monitoring well MW-1 was installed near the source of contamination, MW-2 is located down-gradient on the west border of the property, MW-3 was placed down-gradient on the northwest corner of the property. Monitoring well locations are shown in Figure 4.

Groundwater monitoring wells MW-1, MW-2, and MW-3 were a direct-push well installed by ARES. Placement of the well screen was roughly centered at the soil/groundwater interface. The monitoring well was set above grade. Monitoring well design characteristics for monitoring wells are as follows:

Material = galvanized pipe
Well screen = 5 ft
Slot size = 0.010 in.
Inside diameter = 1.75 in.
Outside diameter = 2.0 in.

6.2 Groundwater Sampling Method

The monitoring wells were developed, purged and sampled in accordance with the UST Procedures Manual and standard procedures. Disposable polyethylene water bailers and

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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 bailer was carefully lowered in to the well to avoid loss of volatiles and water collected from the bailer 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.

Groundwater samples were collected from MW-1, MW-2, and MW-3 on August 14, 2007 in general accordance with ADEC Oil and Other Hazardous Substances Pollution Control Regulations (18 AAC 75 – amended December 30, 2006). A blind duplicate sample was collected from monitoring well MW-2 for quality assurance/quality control purposes. Purge water was placed in labeled 55-gallon drums and stored on-site.

A closed loop water elevation survey was conducted to determine groundwater flow direction. The groundwater was determined to flow in a northwest direction which is consistent with other regional data.

6.3 Analytical Results for Groundwater Samples

A strong petroleum odor and free product were observed from water purged during sampling activities from monitoring well MW-1. Slight petroleum odor and a light non-aqueous phase liquid (LNAPL) assumed to be fuel oil was observed in the purge material from monitoring wells MW-2 and MW-3. Groundwater was approximately 7' below ground surface at the time of sampling.

All monitoring wells were sampled and analyzed for DRO by method AK102 and BTEX by method EPA 8021B. A summary of current sample results are shown in Table 6.3. Complete laboratory results are included in Appendix A.

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**Table 6.3
Groundwater Analytical Results Summary
(Results shown as mg/L)**

Summary of Constituents Detected in Groundwater						
Location	Date Sampled	DRO	Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-1	8/14/2007	9190	.859	2.300	.655	4.560
MW-2	8/14/2007	2.34	ND	ND	ND	ND
MW-3	8/14/2007	19.0	.00852	ND	ND	ND
DUP-C (Field Duplicate Sample to MW-2)	8/14/2007	4.52	ND	ND	ND	ND
ADEC Cleanup Level		1.5	0.005	1.0	0.7	10.0

mg/L – Milligrams/Liter (Equivalent to ppm)
 ND - Compound was not detected (less than the practical quantitation limit)
 Results above ADEC Regulatory Limit in **Bold**.
 N/A – Not Applicable
 Dup – Duplicate field blank sample

Analytical results indicate that DRO is above ADEC groundwater cleanup target levels in all monitoring wells. Benzene was found to be above cleanup levels in MW-1 and MW-3. Toluene was found to be above groundwater cleanup levels in MW-1.

7.0 QUALITY ASSURANCE AND QUALITY CONTROL

Field quality control (QC) procedures for this project included the collection and analysis of a field duplicate and trip blank, which accompanied the samples in the field. One field duplicate (DUP-C) was collected for quality control purposes. Sample DUP-C was a blind duplicate to MW-2. 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.

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 fell

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within our acceptable range or were not calculable. 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

The following blind field duplicates and associated RFD calculations are as follows:

MW-2 and DUP-C (Field Duplicate)

DRO (AK102) $(4.52-2.34)/[(4.52+2.34)/2] \times 100 = 63.6 \%$

BTEX compounds not calculable due to non-detect values for one or both samples.

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 outside the acceptable limits (30%).

8.0 INDOOR AIR SAMPLING

Indoor air samples were collected as part of the investigation to assess potential for indoor air vapor intrusion. In August 2007, the owner installed a fan in the crawlspace which was vented to the outside air. The system operated for approximately two weeks and the system shut down for three days prior to sampling (September 12 sampling event). The samples consisted of a 24-hour time integrated samples and were collected using a 6-liter summa canisters and a flow controller. Samples were analyzed for BTEX compounds and naphthalene using EPA Method TO15. A summary of analytical results for September 12 sampling event are shown in Table 8.1. Complete analytical results are shown in Appendix B.

**Table 8.1
Air Quality Analytical Results Summary
September 12 2007, Sampling Event**

Compound	Sample ID	Benzene ug/m ³	Toluene ug/m ³	Ethylbenzene ug/m ³	m,p-Xylenes ug/m ³	o-Xylene ug/m ³	Naphthalene ug/m ³
Crawlspace	AH1-92007	3.7	31	17	86	45	15
Bathroom	AH2-92007	1.2	12	5.2	21	11	3.4
Classroom	AH3-92007	1.4	13	6.7	28	14	5.2
<i>Duplicate</i>	AH3-92007	1.4	13	6.7	28	14	5.0
Limits*		0.31	40	2.2	7000	7000	3.0

Results above recommended indoor air target limits* in **Bold**.

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* Recommended indoor air target limits are in accordance with EPA Table 2C (risk of 10⁻⁶) of the U.S. Environmental Protection Agency Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), November 2002.

Following review of indoor air sample results, it was recommended that the property owner implement the following actions in order to reduce indoor air contaminant levels:

- Install a larger output fan to provide a positive pressure and increase air exchange;
- Run a heating vent into the crawl space to prevent freeze up;
- Seal any openings between crawl space and interior floor (i.e. crawl space hatch cover). Note: vents in classroom and bathroom are heating ducts and are not open to the crawl space; and
- Cover and seal the crawlspace floor (dirt) with visqueen to reduce vapor intrusion.

The recommendations were implemented and re-sampled again on October 23, 2007. The same sample collection procedure was used as the September sampling event with the exception that the system was in operation during the October sampling event. A summary of analytical results for October 23, sampling event are show in Table 8.2 Complete analytical results are shown in Appendix B.

**Table 8.2
Air Quality Analytical Results Summary
October 23 2007, Sampling Event**

Compound	Sample ID	Benzene ug/m ³	Toluene ug/m ³	Ethylbenzene ug/m ³	m,p-Xylenes ug/m ³	o-Xylene ug/m ³	Naphalene ug/m ³
Crawlspace	AH1-1007	1.4	7.8	3.0	15	8.8	3.3
Bathroom	AH2-1007	ND	5.7	1.5	6.7	3.7	1.9
Classroom	AH3-1007	ND	5.3	ND	5.6	2.9	1.4
Limits*		0.31	40	2.2	7000	7000	3.0

Results above recommended indoor air target limits* in **Bold**.

* Recommended indoor air target limits are in accordance with EPA Table 2C (risk of 10⁻⁶) of the U.S. Environmental Protection Agency Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), November 2002.

Sample results indicate that there was a reduction in contaminants in indoor air for all samples collected compared to September sampling event. The target levels for benzene,ethylbenzene, and naphalene in indoor air were above EPA recommended limits, however, this was only for the sample collected in the crawlspace. Samples collected in the occupied area were below EPA recommended limits.

9.0 CONCLUSIONS AND RECOMMENDATIONS

Well Survey

A well survey was conducted within a ¼ mile radius of the subject property in order to identify potential receptors. Results of the well survey indicate that there were six (6) confirmed drinking water wells within the search radius and a potential of three (3) additional wells based on information obtained by North Pole City Utilities department. All wells were determined to lie cross-gradient from the source area. In addition, all wells were found to be $\geq 30'$ in depth. It is unlikely that drinking water wells found within the search area would be affected by the petroleum release occurring at the subject property.

Groundwater

Groundwater monitoring wells were installed and samples collected at the source area and down-gradient in order to assess potential impacts to groundwater and to determine if contaminants were migrating off-site.

Analytical results indicate that DRO is above ADEC groundwater cleanup target levels in all monitoring wells. Benzene was found to be above cleanup levels in MW-1 and MW-3. Toluene was found to be above groundwater cleanup levels in MW-1. Groundwater contamination was found to migrate off-site to the west – north. It is anticipated that the contaminant plume leading edge is to the northwest which is the groundwater flow direction. The lateral and horizontal extent of the contaminant plume is undetermined at this time.

A product recovery well was installed at the source area and approximately 75-gallons of free product have been recovered to date. Though collection of free product has diminished, free product is still visible on the water table in the recovery well.

Indoor air

Indoor air samples were collected as part of the investigation to assess potential for indoor air vapor intrusion. Indoor air samples were collected in the building crawl space and interior of the building to obtain representative samples.

Analytical results indicate that vapor intrusion is occurring at the site. Mitigation measures appear to have been successful in reducing indoor air contaminants within the occupied building space to levels below the recommended EPA target levels.

Based on the above findings ARES recommends the following actions:

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- The extent of the contaminant plume is undetermined at this time. Additional off-site groundwater grab samples would need to be collected in order to define the limits of the plume;
- It is recommended that additional on-site groundwater sampling be conducted to determine if the plume is increasing, decreasing, or has reached a state of equilibrium. It is recommended that semi-annual samples be collected during periods of low (spring) and high (fall) water table conditions until the trend can be established;
- Based on levels of benzene and DRO found in groundwater, it is recommended that groundwater cleanup options (both active remediation system and natural attenuation) be evaluated to assess clean up actions required to meet ADEC groundwater cleanup levels;
- Free product recovery should continue until all available free product has been recovered;
- Owner should continue to operate the ventilation system year-round in order to minimize effects of indoor air vapor intrusion;
- It is recommended that indoor air samples be collected following similar format when pressure differential gradient is greatest between the building and subsurface (January/February) to assess adequacy of ventilation system and to determine if further mitigation measures are necessary to reduce indoor air contaminant levels; and
- Contaminated soils still remain on-site. Any disturbance/excavation of soils on the subject property should be field screened and/or sampled to determine if contaminants exceed ADEC target cleanup levels for soil.

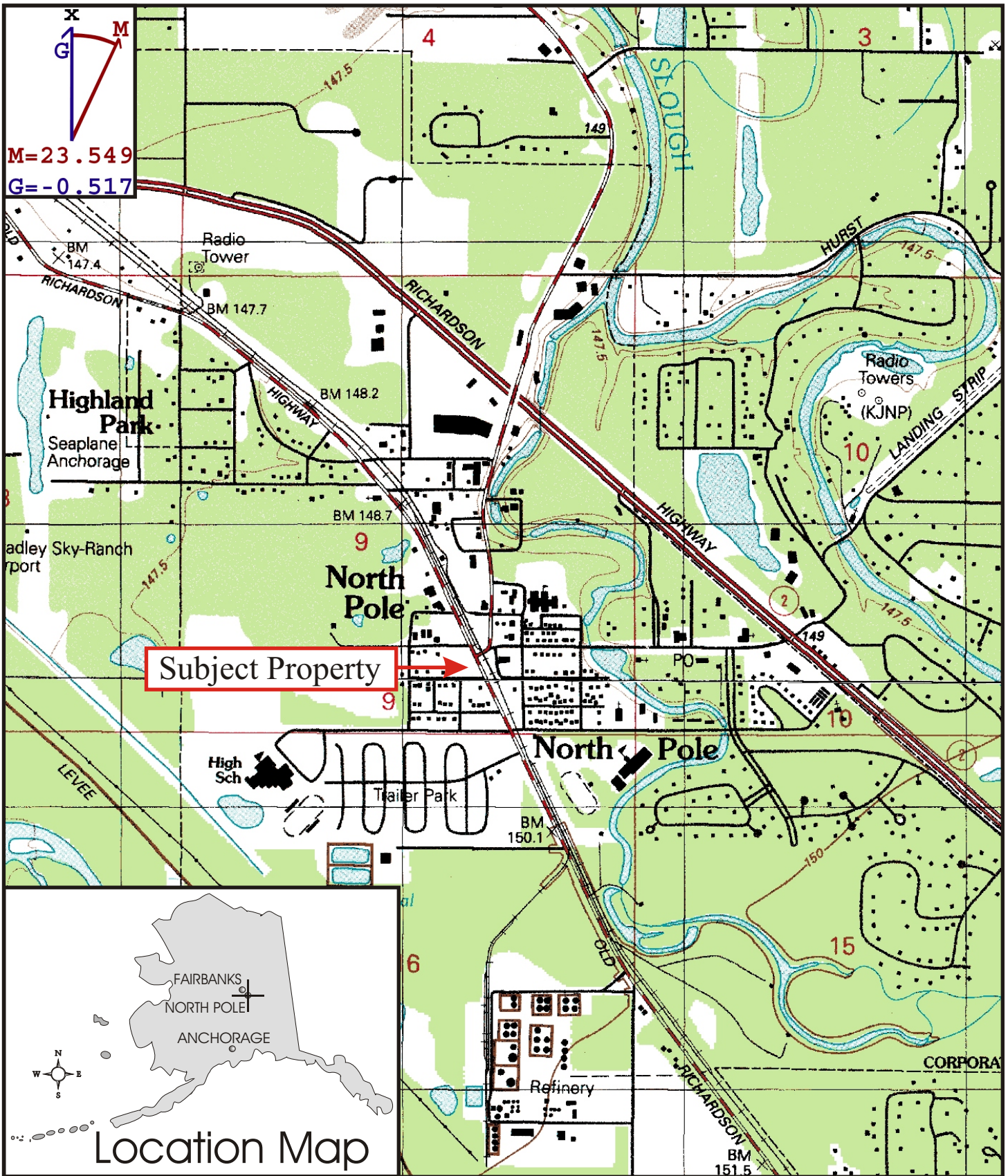
10.0 LIMITATIONS OF INVESTIGATION

This report presents the analytical results from a limited number of groundwater and indoor air samples, and should not be construed as a comprehensive study of subsurface conditions at the site. The samples were intended to evaluate the presence or absence of contaminants at the locations selected. Detectable levels of petroleum hydrocarbons or other substances may be present at different locations. It was also not the intent of our sampling and testing to detect the presence of soil affected by contaminants other than those for which laboratory analysis were performed. 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 Alaska Home Solutions 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 condition

Appendix A



Location Map

1992 Topo Map
Fairbanks, Alaska
Quad D-1

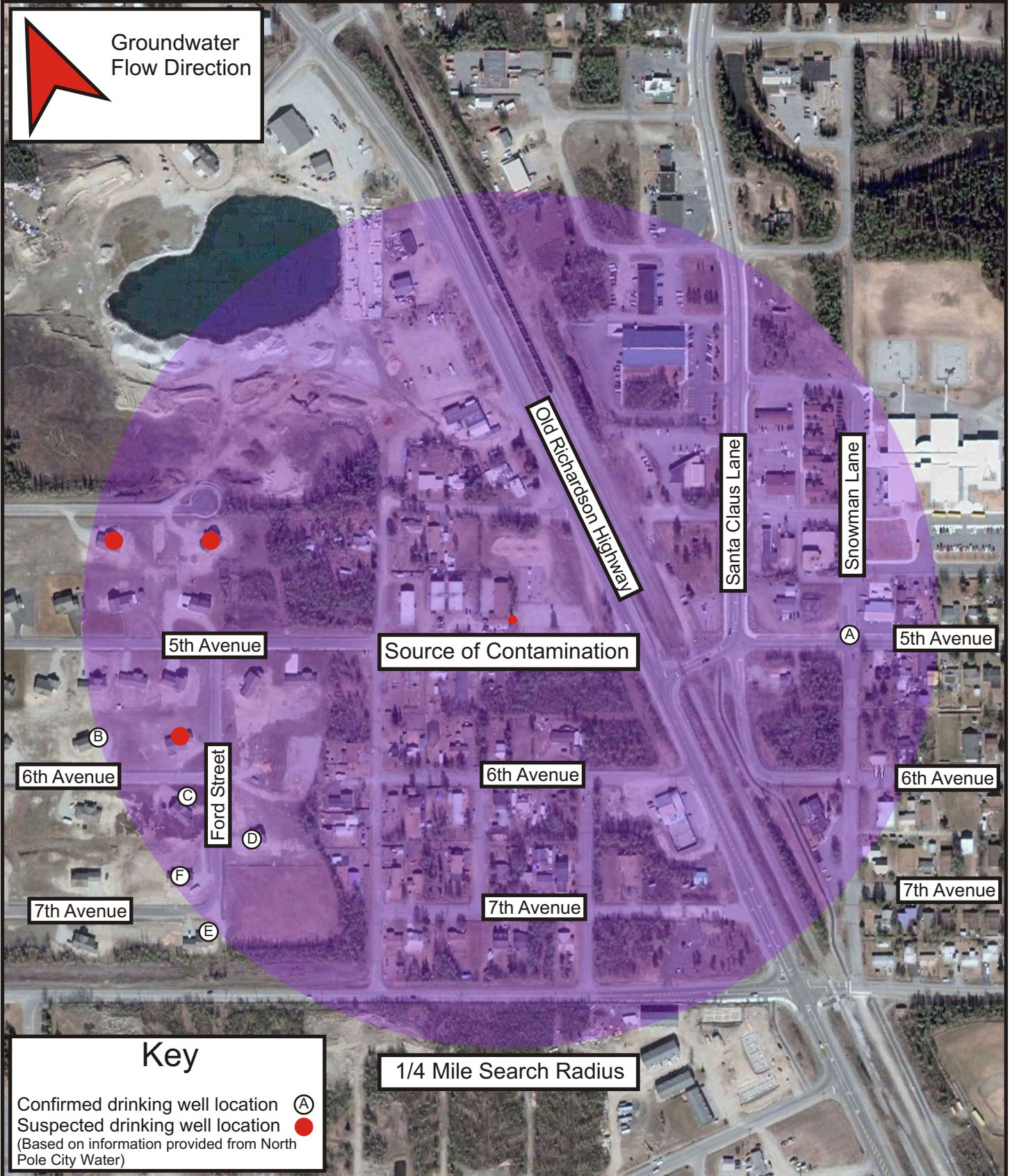
Scale in Miles:

**Groundwater/ Air
Monitoring Report
297 Fifth Avenue
North Pole, AK 99705**

October 2007

FIGURE 1

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



Groundwater
Flow Direction

Source of Contamination

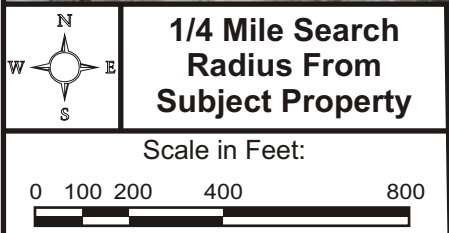
1/4 Mile Search Radius

Key

Confirmed drinking well location (A)

Suspected drinking well location (Red Dot)

(Based on information provided from North Pole City Water)



**Groundwater/ Air
Monitoring Report
297 Fifth Avenue
North Pole, AK 99705**

November 2007

FIGURE 2

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

ALASKA RESOURCES AND ENVIRONMENTAL SERVICES, LLC

PHONE: 907-374-3226 • FAX: 907-374-3219 • EMAIL: AK.RES.ENV.SVC@GCI.NET

PUBLIC HEALTH ASSESSMENT

September 19, 2007

<Property Owner>
<Property Address>

**SUBJECT: POTENTIAL GROUNDWATER CONTAMINATION IN THE VICINITY
OF <SUBDIVISION> SUBDIVISION**

Dear <Property Owner>:

The Alaska Department of Environmental Conservation (ADEC) has asked Alaska Resources and Environmental Services LLC, (ARES) to establish a list of potential receptors within a portion of the <SUBDIVISION> Subdivision that may have been affected due to a diesel fuel release to the groundwater. Fairbanks North Star Borough Records indicate that you are the owner of the property at <Property Address>. Please provide the information requested below in the space provided (if unknown, please indicate). Please complete Section A of the survey even if you do not have a well or a groundwater pumping sump so we can demonstrate to ADEC you have been contacted. If you own multiple lots within <SUBDIVISION> Subdivision, please designate lot(s) accordingly on the survey form.

The results of this assessment will be used to determine whether the water in your well or sump should be tested for the presence of diesel range organic compounds. If testing is recommended, ARES would perform the test free of charge, performed at your convenience, and you'll receive a copy of the laboratory report. Please contact Lyle Gresehover of Alaska Resources and Environmental Services, LLC (907-374-3226) if you have any questions or concerns regarding this assessment.

SECTION A

Name of property owner of subject site: _____

Owner address: _____

Owner telephone number (if a well or sump is present): _____

Name of tenant at subject site (if not owner occupied): _____

Tenant telephone number (if a well or sump is present): _____

Is the subject site used for commercial or residential purposes? _____

Does the subject site contain multiple tenants? _____

Is there a well at the subject site? _____

Is there a sump at the subject site that pumps groundwater? _____

SECTION B (complete if a well exists at the subject site)

Number of wells: _____ Well Diameter(s): _____

Well Depth(s): _____ Pump Depth(s): _____

Material used for the well casing: _____

Date(s) the well(s) were installed: _____

How frequently are the well(s) used? _____

Approximate gallons of water pumped during each well cycle: _____

What is the well water used for? _____

SECTION C (complete if you have a sump which pumps groundwater)

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

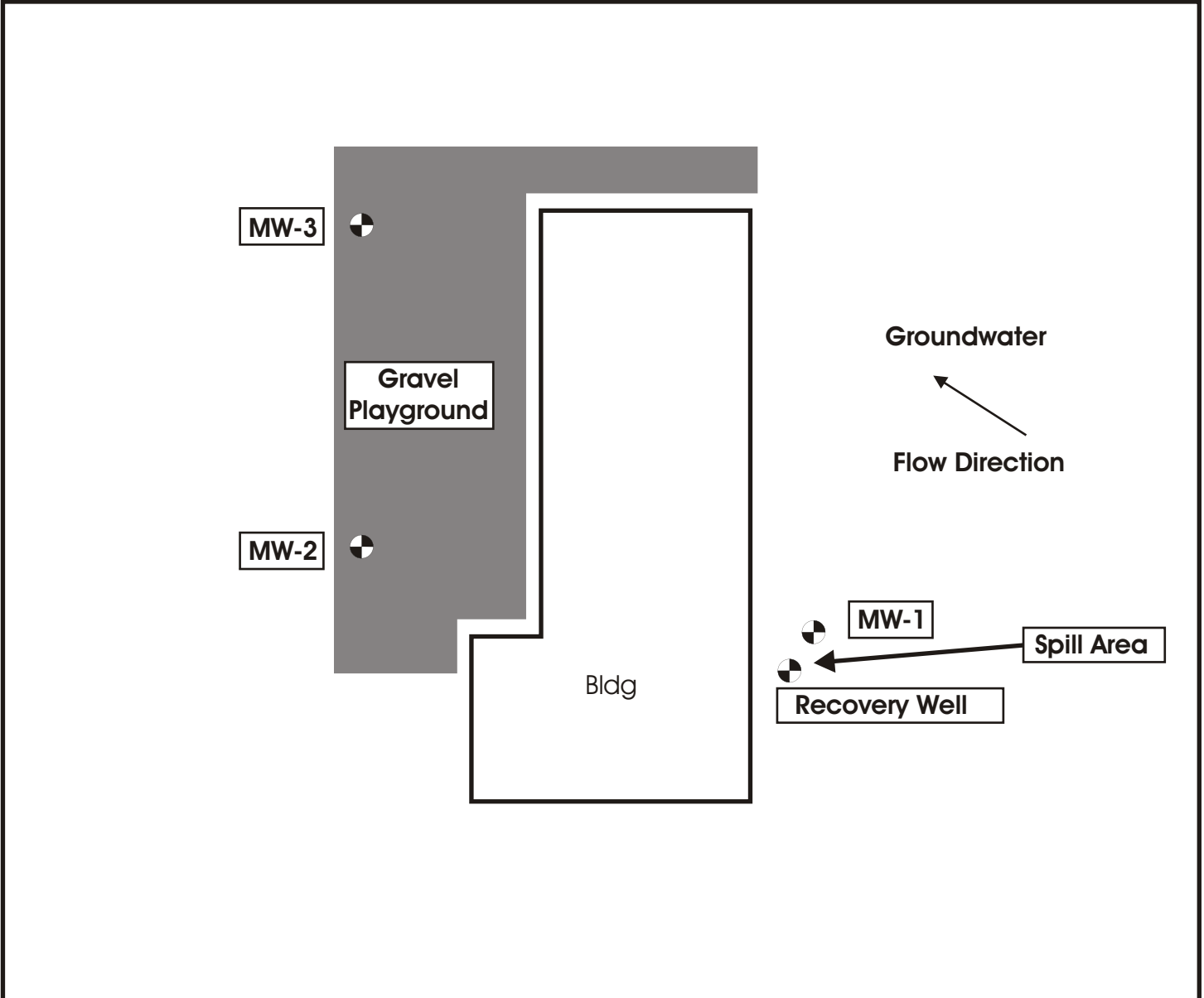
Please return this questionnaire in the enclosed self-addressed stamped envelope as soon as possible. A second questionnaire will be mailed to your attention if we do not receive a response within two weeks due to the importance of this issue. Again, please participate for your protection. Please include any comments you may have on the bottom of this page.

Sincerely,



Lyle Gresehover
Alaska Resources and Environmental Services, LLC

Additional Comments (if any): _____



Fifth Avenue



Site Map

Scale in Feet:



**Groundwater/ Air
Monitoring Report
297 Fifth Avenue
North Pole, AK 99705**

October 2007

FIGURE 4

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

Appendix B

August 30, 2007

Lyle Gresehover
Alaska Resources & Environmental Services
P.O. Box 83050
Fairbanks, AK 99708

RE: Alaska Home Solutions Inc.

Enclosed are the results of analyses for samples received by the laboratory on 08/21/07 09:12.
The following list is a summary of the Work Orders contained in this report, generated on 08/30/07
15:37.

If you have any questions concerning this report, please feel free to contact me.

<u>Work Order</u>	<u>Project</u>	<u>ProjectNumber</u>
AQH0092	Alaska Home Solutions Inc.	[none]

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Alaska Resources & Environmental Services P.O. Box 83050 Fairbanks, AK 99708	Project Name:	Alaska Home Solutions Inc.	Report Created:
	Project Number:	[none]	08/30/07 15:37
	Project Manager:	Lyle Gresehover	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	AQH0092-01	Water	08/14/07 13:12	08/21/07 09:12
MW-2	AQH0092-02	Water	08/14/07 15:06	08/21/07 09:12
MW-3	AQH0092-03	Water	08/14/07 17:10	08/21/07 09:12
DUP-C	AQH0092-04	Water	08/14/07 19:14	08/21/07 09:12
Trip Blank	AQH0092-05	Water	08/14/07 08:00	08/21/07 09:12

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Alaska Resources & Environmental Services	Project Name: Alaska Home Solutions Inc.	
P.O. Box 83050	Project Number: [none]	Report Created:
Fairbanks, AK 99708	Project Manager: Lyle Gresehover	08/30/07 15:37

Diesel Range Organics (C10-C25) per AK102
TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQH0092-01 (MW-1)		Water			Sampled: 08/14/07 13:12					
Diesel Range Organics	AK 102	9190	----	197	mg/l	100x	7080133	08/24/07 11:49	08/29/07 21:57	RL7
<i>Surrogate(s): 1-Chlorooctadecane</i>			351%		50 - 150 %	"			"	Z3
AQH0092-02 (MW-2)		Water			Sampled: 08/14/07 15:06					
Diesel Range Organics	AK 102	2.34	----	0.391	mg/l	1x	7080133	08/24/07 11:49	08/27/07 22:26	
<i>Surrogate(s): 1-Chlorooctadecane</i>			85.0%		50 - 150 %	"			"	
AQH0092-03 (MW-3)		Water			Sampled: 08/14/07 17:10					
Diesel Range Organics	AK 102	19.0	----	0.391	mg/l	1x	7080133	08/24/07 11:49	08/27/07 23:00	
<i>Surrogate(s): 1-Chlorooctadecane</i>			90.0%		50 - 150 %	"			"	
AQH0092-04 (DUP-C)		Water			Sampled: 08/14/07 19:14					
Diesel Range Organics	AK 102	4.52	----	0.391	mg/l	1x	7080148	08/27/07 13:18	08/29/07 19:42	
<i>Surrogate(s): 1-Chlorooctadecane</i>			80.9%		50 - 150 %	"			"	

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Alaska Resources & Environmental Services	Project Name: Alaska Home Solutions Inc.	Report Created:
P.O. Box 83050	Project Number: [none]	08/30/07 15:37
Fairbanks, AK 99708	Project Manager: Lyle Gresehover	

BTEX by EPA Method 8021B
 TestAmerica - Anchorage, AK

Analyte	Method	Result	MDL*	MRL	Units	Dil	Batch	Prepared	Analyzed	Notes
AQH0092-01 (MW-1)		Water				Sampled: 08/14/07 13:12				RL7
Benzene	EPA 8021B	859	----	500	ug/l	1000x	7080130	08/24/07 09:57	08/26/07 13:16	
Toluene	"	2300	----	500	"	"	"	"	"	
Ethylbenzene	"	655	----	500	"	"	"	"	"	
Xylenes (total)	"	4560	----	1500	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (PID)			121%		50 - 150 %	1x				"
AQH0092-02 (MW-2)		Water				Sampled: 08/14/07 15:06				
Benzene	EPA 8021B	ND	----	0.500	ug/l	1x	7080130	08/24/07 09:57	08/26/07 13:50	
Toluene	"	ND	----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	----	1.50	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (PID)			114%		50 - 150 %	"				"
AQH0092-03 (MW-3)		Water				Sampled: 08/14/07 17:10				
Benzene	EPA 8021B	8.52	----	0.500	ug/l	1x	7080130	08/24/07 09:57	08/26/07 14:23	
Toluene	"	ND	----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	----	1.50	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (PID)			111%		50 - 150 %	"				"
AQH0092-04 (DUP-C)		Water				Sampled: 08/14/07 19:14				
Benzene	EPA 8021B	ND	----	0.500	ug/l	1x	7080130	08/24/07 09:57	08/26/07 14:57	
Toluene	"	ND	----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	----	1.50	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (PID)			111%		50 - 150 %	"				"
AQH0092-05 (Trip Blank)		Water				Sampled: 08/14/07 08:00				
Benzene	EPA 8021B	ND	----	0.500	ug/l	1x	7080130	08/24/07 09:57	08/26/07 03:52	
Toluene	"	ND	----	0.500	"	"	"	"	"	
Ethylbenzene	"	ND	----	0.500	"	"	"	"	"	
Xylenes (total)	"	ND	----	1.50	"	"	"	"	"	
Surrogate(s): a,a,a-TFT (PID)			104%		50 - 150 %	"				"

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

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Alaska Resources & Environmental Services	Project Name: Alaska Home Solutions Inc.	
P.O. Box 83050	Project Number: [none]	Report Created:
Fairbanks, AK 99708	Project Manager: Lyle Gresehover	08/30/07 15:37

Diesel Range Organics (C10-C25) per AK102 - Laboratory Quality Control Results
 TestAmerica - Anchorage, AK

QC Batch: 7080133	Water Preparation Method: EPA 3510
--------------------------	---

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes		
Blank (7080133-BLK1)													Extracted: 08/24/07 11:49			
Diesel Range Organics	AK 102	ND	---	0.500	mg/l	1x	--	--	--	--	--	--	08/27/07 21:19			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 102%</i>		<i>Limits: 50-150%</i>	<i>"</i>								<i>08/27/07 21:19</i>			
LCS (7080133-BS1)													Extracted: 08/24/07 11:49			
Diesel Range Organics	AK 102	10.9	---	0.500	mg/l	1x	--	10.1	108%	(75-125)	--	--	08/27/07 21:53			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 101%</i>		<i>Limits: 60-120%</i>	<i>"</i>								<i>08/27/07 21:53</i>			
LCS Dup (7080133-BSD1)													Extracted: 08/24/07 11:49			
Diesel Range Organics	AK 102	10.9	---	0.500	mg/l	1x	--	10.1	108%	(75-125)	0.325% (20)		08/27/07 22:26			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 101%</i>		<i>Limits: 60-120%</i>	<i>"</i>								<i>08/27/07 22:26</i>			
Duplicate (7080133-DUP1)													QC Source: AQH0070-01		Extracted: 08/24/07 11:49	
Diesel Range Organics	AK 102	ND	---	0.413	mg/l	1x	ND	--	--	--	0.158% (20)		08/27/07 21:19			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 83.5%</i>		<i>Limits: 50-150%</i>	<i>"</i>								<i>08/27/07 21:19</i>			

QC Batch: 7080148	Water Preparation Method: EPA 3510
--------------------------	---

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes		
Blank (7080148-BLK1)													Extracted: 08/27/07 13:18			
Diesel Range Organics	AK 102	ND	---	0.500	mg/l	1x	--	--	--	--	--	--	08/28/07 11:43			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 98.1%</i>		<i>Limits: 50-150%</i>	<i>"</i>								<i>08/28/07 11:43</i>			
LCS (7080148-BS1)													Extracted: 08/27/07 13:18			
Diesel Range Organics	AK 102	10.4	---	0.500	mg/l	1x	--	10.1	103%	(75-125)	--	--	08/28/07 12:16			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 101%</i>		<i>Limits: 60-120%</i>	<i>"</i>								<i>08/28/07 12:16</i>			
LCS Dup (7080148-BSD1)													Extracted: 08/27/07 13:18			
Diesel Range Organics	AK 102	9.73	---	0.500	mg/l	1x	--	10.1	96.3%	(75-125)	6.25% (20)		08/28/07 16:48			
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 91.3%</i>		<i>Limits: 60-120%</i>	<i>"</i>								<i>08/28/07 16:48</i>			
Duplicate (7080148-DUP1)													QC Source: AQH0079-06		Extracted: 08/27/07 13:18	
Diesel Range Organics	AK 102	11.4	---	0.403	mg/l	1x	7.93	--	--	--	36.3% (20)		08/28/07 11:43	R2		
<i>Surrogate(s): 1-Chlorooctadecane</i>		<i>Recovery: 88.1%</i>		<i>Limits: 50-150%</i>	<i>"</i>								<i>08/28/07 11:43</i>			

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Alaska Resources & Environmental Services	Project Name: Alaska Home Solutions Inc.	Report Created:
P.O. Box 83050	Project Number: [none]	08/30/07 15:37
Fairbanks, AK 99708	Project Manager: Lyle Gresehover	

BTEX by EPA Method 8021B - Laboratory Quality Control Results
 TestAmerica - Anchorage, AK

QC Batch: 7080130 Water Preparation Method: EPA 5030B

Analyte	Method	Result	MDL*	MRL	Units	Dil	Source Result	Spike Amt	% REC	(Limits)	% RPD	(Limits)	Analyzed	Notes
---------	--------	--------	------	-----	-------	-----	---------------	-----------	-------	----------	-------	----------	----------	-------

Blank (7080130-BLK1)

Extracted: 08/24/07 09:57

Benzene	EPA 8021B	ND	---	0.500	ug/l	1x	--	--	--	--	--	--	08/26/07 02:45	
Toluene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Ethylbenzene	"	ND	---	0.500	"	"	--	--	--	--	--	--	"	
Xylenes (total)	"	ND	---	1.50	"	"	--	--	--	--	--	--	"	

Surrogate(s): a,a,a-TFT (PID) Recovery: 99.1% Limits: 50-150% " 08/26/07 02:45

LCS (7080130-BS1)

Extracted: 08/24/07 09:57

Benzene	EPA 8021B	18.7	---	0.500	ug/l	1x	--	20.6	90.9%	(80-120)	--	--	08/26/07 01:38	
Toluene	"	19.9	---	0.500	"	"	--	19.7	101%	"	--	--	"	
Ethylbenzene	"	21.7	---	0.500	"	"	--	19.8	110%	(80-126)	--	--	"	
Xylenes (total)	"	61.8	---	1.50	"	"	--	59.6	104%	(80-127)	--	--	"	

Surrogate(s): a,a,a-TFT (PID) Recovery: 100% Limits: 60-120% " 08/26/07 01:38

LCS Dup (7080130-BSD1)

Extracted: 08/24/07 09:57

Benzene	EPA 8021B	19.9	---	0.500	ug/l	1x	--	20.6	96.8%	(80-120)	6.25% (13.8)	--	08/26/07 08:50	
Toluene	"	20.5	---	0.500	"	"	--	19.7	104%	"	3.19% (10.4)	--	"	
Ethylbenzene	"	22.1	---	0.500	"	"	--	19.8	111%	(80-126)	1.65% (11.8)	--	"	
Xylenes (total)	"	62.9	---	1.50	"	"	--	59.6	106%	(80-127)	1.78% (11.2)	--	"	

Surrogate(s): a,a,a-TFT (PID) Recovery: 107% Limits: 60-120% " 08/26/07 08:50

Matrix Spike (7080130-MS1)

QC Source: AQH0108-02

Extracted: 08/24/07 09:57

Benzene	EPA 8021B	20.7	---	0.500	ug/l	1x	0.213	20.6	99.7%	(69-124)	--	--	08/27/07 14:05	
Toluene	"	21.0	---	0.500	"	"	0.109	19.7	106%	(80-126)	--	--	"	
Ethylbenzene	"	22.3	---	0.500	"	"	0.0970	19.8	112%	(77.3-143)	--	--	"	
Xylenes (total)	"	62.3	---	1.50	"	"	0.609	59.6	103%	(67.5-140)	--	--	"	

Surrogate(s): a,a,a-TFT (PID) Recovery: 114% Limits: 50-150% " 08/27/07 14:05

Matrix Spike Dup (7080130-MSD1)

QC Source: AQH0108-02

Extracted: 08/24/07 09:57

Benzene	EPA 8021B	21.1	---	0.500	ug/l	1x	0.213	20.6	101%	(69-124)	1.49% (10)	--	08/27/07 14:38	
Toluene	"	21.1	---	0.500	"	"	0.109	19.7	106%	(80-126)	0.342% "	--	"	
Ethylbenzene	"	22.5	---	0.500	"	"	0.0970	19.8	113%	(77.3-143)	1.10% "	--	"	
Xylenes (total)	"	62.5	---	1.50	"	"	0.609	59.6	104%	(67.5-140)	0.407% "	--	"	

Surrogate(s): a,a,a-TFT (PID) Recovery: 119% Limits: 50-150% " 08/27/07 14:38

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

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Alaska Resources & Environmental Services

P.O. Box 83050
Fairbanks, AK 99708

Project Name: **Alaska Home Solutions Inc.**

Project Number: [none]

Project Manager: Lyle Gresehover

Report Created:

08/30/07 15:37

Notes and Definitions

Report Specific Notes:

- R2 - The RPD exceeded the acceptance limit.
- RL7 - Sample required dilution due to high concentrations of target analyte.
- Z3 - The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Laboratory Reporting Conventions:

- DET - Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only.
- ND - Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate).
- NR/NA - Not Reported / Not Available
- dry - Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight.
- wet - Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis.
- RPD - RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries).
- MRL - METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table.
- MDL* - METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results.
- Dil - Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data.
- Reporting Limits - Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable.
- Electronic Signature - Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy*. Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

TestAmerica - Anchorage, AK



Troy J. Engstrom, Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



CHAIN OF CUSTODY REPORT

Work Order #: **AQH0092**

CLIENT: Alaska Resources and Environmental Services				INVOICE TO: ARES P.O. Box 83050 Fairbanks, Alaska 99708				TURNAROUND REQUEST in Business Days * Organic & Inorganic Analyses <input type="checkbox"/> 10 <input type="checkbox"/> 7 <input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> <1 Petroleum Hydrocarbon Analyses <input checked="" type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> <1 OTHER Specify: * Turnaround Requests less than standard may incur Rush Charges.				
REPORT TO: Email: Lyle@ak-res.com ADDRESS: Mailing: P.O. Box 83050 Fairbanks, Alaska 99708				P.O. NUMBER:								
PHONE: (907) 488-4899 FAX: (907) 488-4823				PRESERVATIVE								
PROJECT NAME: Alaska Home Solutions Inc.				HCL HCL								
PROJECT NUMBER:				REQUESTED ANALYSES								
SAMPLED BY: Lyle Gresehover				BTEX EPA 8021B AK 102								
CLIENT SAMPLE IDENTIFICATION		SAMPLING DATE/TIME						MATRIX (W, S, O)		# OF CONT.	LOCATION / COMMENTS	TA WO ID
1 MW-1		8/14/2007 1312		X X				W	5			01
2 MW-2		8/14/2007 1506		X X				W	5			02
3 MW-3		8/14/2007 1710		X X				W	5			03
4 DUP-C		8/14/2007 1914		X X				W	5			04
5 Trip Blank								W	3			05
6												
7												
8												
9												
10												
RELEASED BY: <i>Lyle Gresehover</i>				DATE: 8/20/07				RECEIVED BY: <i>Johanna Dreher</i>				
PRINT NAME: Lyle Gresehover				FIRM: ARES				DATE: 08/21/07				
TIME: 1:20				FIRM: ARES				TIME: 0912				
ADDITIONAL REMARKS: Phase II level reporting requested.				TEMP: 2.1				PAGE 1 OF 1				

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and for any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice unless otherwise contracted. Sample(s) will be disposed of after 30 days unless otherwise contracted.

Test America Cooler Receipt Form

(Army Corps Compliant)

WORK ORDER # AQH0092 CLIENT: ARE S

PROJECT: Leadline Home

Date /Time Cooler Arrived 08 / 21 / 07 09:12 Cooler signed for by: Johanna Dieler

SECTION 104

(Print name)

Preliminary Examination Phase:

Date cooler opened: same as date received or 1 / 1 /
Cooler opened by (print) Johanna Dieler (sign) Johanna Dieler

1. Delivered by ALASKA AIRLINES Fed-Ex UPS NAC XLYNDEN CLIENT Other: _____

Shipment Tracking # if applicable PR04157077 (include copy of shipping papers in file)

2. Number of Custody Seals 1 Signed by Jason Greenberg Date 8/20/07
Were custody seals unbroken and intact on arrival? Yes No

3. Were custody papers sealed in a plastic bag? Yes No

4. Were custody papers filled out properly (ink, signed, etc.)? Yes No

5. Did you sign the custody papers in the appropriate place? Yes No

6. Was ice used? Yes No Type of ice: blue ice gel ice real ice dry ice Condition of ice: Sol.
Temperature by Digi-Thermo Probe 2.1 °C Thermometer # 126 # 4

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

8. Did samples arrive in plastic bags? Yes No

9. Did all bottles arrive unbroken, and with labels in good condition? Yes No

10. Are all bottle labels complete (ID, date, time, etc.) Yes No

11. Do bottle labels and Chain of Custody agree? Yes No

12. Are the containers and preservatives correct for the tests indicated? Yes No

13. Is there adequate volume for the tests requested? Yes No

14. Were VOA vials free of bubbles? N/A Yes No
If "NO" which containers contained "head space" or bubbles? _____

Log-in Phase:

Date of sample log-in 08 / 21 / 07
Samples logged in by (print) Rae Bronka (sign) Rae Bronka

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

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH1-92007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859
 CAS Sample ID: P2702859-001

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister
 Test Notes:
 Container ID: AC01251

Date Collected: 9/12/07
 Date Received: 9/17/07
 Date(s) Analyzed: 9/20/07
 Volume(s) Analyzed: 0.30 Liter(s)

Pi 1 = -2.2 Pf 1 = 3.6

Can D.F. = 1.46

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	3.7	2.4	1.2	0.76	
108-88-3	Toluene	31	2.4	8.3	0.65	
100-41-4	Ethylbenzene	17	2.4	4.0	0.56	
179601-23-1	<i>m,p</i> -Xylenes	86	4.9	20	1.1	
95-47-6	<i>o</i> -Xylene	45	2.4	10	0.56	
91-20-3	Naphthalene	15	2.4	2.8	0.46	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH2-92007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859
 CAS Sample ID: P2702859-002

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC00605

Date Collected: 9/12/07
Date Received: 9/17/07
Date(s) Analyzed: 9/20/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = -2.1 Pf 1 = 3.7

Can D.F. = 1.46

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	1.2	0.73	0.38	0.23	
108-88-3	Toluene	12	0.73	3.2	0.19	
100-41-4	Ethylbenzene	5.2	0.73	1.2	0.17	
179601-23-1	<i>m,p</i> -Xylenes	21	1.5	4.9	0.34	
95-47-6	<i>o</i> -Xylene	11	0.73	2.4	0.17	
91-20-3	Naphthalene	3.4	0.73	0.65	0.14	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH3-92007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859
 CAS Sample ID: P2702859-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC01000

Date Collected: 9/12/07
Date Received: 9/17/07
Date(s) Analyzed: 9/20/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = 0.5 Pf 1 = 3.5

Can D.F. = 1.20

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	1.4	0.60	0.45	0.19	
108-88-3	Toluene	13	0.60	3.5	0.16	
100-41-4	Ethylbenzene	6.7	0.60	1.5	0.14	
179601-23-1	<i>m,p</i> -Xylenes	28	1.2	6.5	0.28	
95-47-6	<i>o</i> -Xylene	14	0.60	3.3	0.14	
91-20-3	Naphthalene	5.2	0.60	0.99	0.11	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH3-92007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859
 CAS Sample ID: P2702859-003DUP

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:
Container ID: AC01000

Date Collected: 9/12/07
Date Received: 9/17/07
Date(s) Analyzed: 9/20/07
Volume(s) Analyzed: 1.00 Liter(s)

Pi 1 = 0.5 Pf 1 = 3.5

Can D.F. = 1.20

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	1.4	0.60	0.45	0.19	
108-88-3	Toluene	13	0.60	3.4	0.16	
100-41-4	Ethylbenzene	6.7	0.60	1.5	0.14	
179601-23-1	<i>m,p</i> -Xylenes	28	1.2	6.4	0.28	
95-47-6	<i>o</i> -Xylene	14	0.60	3.2	0.14	
91-20-3	Naphthalene	5.0	0.60	0.95	0.11	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: Method Blank
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859
 CAS Sample ID: P070920-MB

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister
 Test Notes:

Date Collected: NA
 Date Received: NA
 Date(s) Analyzed: 9/20/07
 Volume(s) Analyzed: 1.00 Liter(s)

D.F. = 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	<i>m,p</i> -Xylenes	ND	1.0	ND	0.23	
95-47-6	<i>o</i> -Xylene	ND	0.50	ND	0.12	
91-20-3	Naphthalene	ND	0.50	ND	0.095	

ND = Compound was analyzed for, but not detected above the **laboratory reporting limit**.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859

Surrogate Spike Recovery Results

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister(s)
 Test Notes:

Date Collected: 9/12/07
 Date Received: 9/17/07
 Date Analyzed: 9/20/07

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d4		Toluene-d8		Bromofluorobenzene		Data Qualifier
		% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	
Method Blank	P070920-MB	94	70-130	108	70-130	112	70-130	
Lab Control Sample	P070920-LCS	98	70-130	110	70-130	113	70-130	
AH1-92007	P2702859-001	94	70-130	105	70-130	111	70-130	
AH2-92007	P2702859-002	92	70-130	106	70-130	111	70-130	
AH3-92007	P2702859-003	97	70-130	106	70-130	111	70-130	
AH3-92007	P2702859-003DUP	93	70-130	105	70-130	110	70-130	

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: Lab Control Sample
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2702859
CAS Sample ID: P070920-LCS

Laboratory Control Sample (LCS) Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Chaney Humphrey
Sampling Media: Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 9/20/07
Volume(s) Analyzed: NA Liter

CAS #	Compound	Amount Spiked ng	Amount Recovered ng	% Recovery	CAS Acceptance Limits	Data Qualifier
71-43-2	Benzene	26.3	21.3	81	73-111	
108-88-3	Toluene	26.0	24.2	93	76-116	
100-41-4	Ethylbenzene	25.8	24.7	96	79-116	
179601-23-1	m,p-Xylenes	61.5	59.7	97	80-117	
95-47-6	o-Xylene	29.0	28.0	97	80-116	
91-20-3	Naphthalene	26.0	24.5	94	76-143	

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH1-1007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2703322
 CAS Sample ID: P2703322-001

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister
 Test Notes:
 Container ID: AC00248

Date Collected: 10/23/07
 Date Received: 10/30/07
 Date Analyzed: 11/1/07
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): 0.3 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.21

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
71-43-2	Benzene	1.4	1.2	0.44	0.38	
108-88-3	Toluene	7.8	1.2	2.1	0.32	
100-41-4	Ethylbenzene	3.0	1.2	0.69	0.28	
179601-23-1	m,p-Xylenes	15	1.2	3.3	0.28	
95-47-6	o-Xylene	8.8	1.2	2.0	0.28	
91-20-3	Naphthalene	3.3	1.2	0.62	0.23	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH2-1007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2703322
 CAS Sample ID: P2703322-002

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister
 Test Notes:
 Container ID: AC00930

Date Collected: 10/23/07
 Date Received: 10/30/07
 Date Analyzed: 11/1/07
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.4 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.48

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
71-43-2	Benzene	ND	1.5	ND	0.46	
108-88-3	Toluene	5.7	1.5	1.5	0.39	
100-41-4	Ethylbenzene	1.5	1.5	0.34	0.34	
179601-23-1	m,p-Xylenes	6.7	1.5	1.5	0.34	
95-47-6	o-Xylene	3.7	1.5	0.84	0.34	
91-20-3	Naphthalene	1.9	1.5	0.37	0.28	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Sample ID: AH3-1007
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2703322
 CAS Sample ID: P2703322-003

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister
 Test Notes:
 Container ID: AC01068

Date Collected: 10/23/07
 Date Received: 10/30/07
 Date Analyzed: 11/1/07
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.4 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.37

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
71-43-2	Benzene	ND	1.4	ND	0.43	
108-88-3	Toluene	5.3	1.4	1.4	0.36	
100-41-4	Ethylbenzene	ND	1.4	ND	0.32	
179601-23-1	m,p-Xylenes	5.6	1.4	1.3	0.32	
95-47-6	o-Xylene	2.9	1.4	0.67	0.32	
91-20-3	Naphthalene	1.4	1.4	0.27	0.26	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Verified By: _____ Date: _____

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC

Client Sample ID: Method Blank

Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2703322

CAS Sample ID: P071101-MB

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Chaney Humphrey

Sampling Media: Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 11/1/07

Volume(s) Analyzed: 1.00 Liter(s)

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
71-43-2	Benzene	ND	1.0	ND	0.31	
108-88-3	Toluene	ND	1.0	ND	0.27	
100-41-4	Ethylbenzene	ND	1.0	ND	0.23	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	1.0	ND	0.23	
91-20-3	Naphthalene	ND	1.0	ND	0.19	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

COLUMBIA ANALYTICAL SERVICES, INC.

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC
Client Project ID: Alaska Home Solutions Inc.

CAS Project ID: P2703322

Test Code: EPA TO-15
 Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
 Analyst: Chaney Humphrey
 Sampling Media: Summa Canister(s)
 Test Notes:

Date(s) Collected: 10/23/07
 Date(s) Received: 10/30/07
 Date(s) Analyzed: 11/1/07

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d4		Toluene-d8		Bromofluorobenzene		Data Qualifier
		% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	
Method Blank	P071101-MB	90	70-130	104	70-130	98	70-130	
Lab Control Sample	P071101-LCS	94	70-130	103	70-130	100	70-130	
AH1-1007	P2703322-001	93	70-130	99	70-130	96	70-130	
AH2-1007	P2703322-002	91	70-130	101	70-130	98	70-130	
AH3-1007	P2703322-003	92	70-130	102	70-130	99	70-130	

COLUMBIA ANALYTICAL SERVICES, INC.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Alaska Resources & Environmental Services LLC

Client Sample ID: Lab Control Sample

CAS Project ID: P2703322

Client Project ID: Alaska Home Solutions Inc.

CAS Sample ID: P071101-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Chaney Humphrey

Date Analyzed: 11/01/07

Sampling Media: Summa Canister

Volume(s) Analyzed: NA Liter(s)

Test Notes:

CAS #	Compound	Spike Amount	Result	% Recovery	CAS Acceptance Limits	Data Qualifier
		ng	ng			
71-43-2	Benzene	27.0	26.4	98	73-111	
108-88-3	Toluene	26.5	26.3	99	76-116	
100-41-4	Ethylbenzene	26.3	25.9	98	79-116	
179601-23-1	m,p-Xylenes	62.5	61.3	98	80-117	
95-47-6	o-Xylene	29.8	28.7	96	80-116	
91-20-3	Naphthalene	26.3	28.8	110	76-143	

Appendix C

STATEMENT OF QUALIFICATIONS

Lyle Gresehover

Education	Bachelor of Science – Geology University of Alaska Fairbanks
Certifications	OSHA 40-Hour HAZWOPER training OSHA 8-Hour HAZWOPER refresher course EPA/AHERA 40-Hour Asbestos Abatement Contractors & Supervisors OSHA On-Site Manager/Supervisor training Confined Space Training Alaska Department of Environmental Conservation Certified Sanitary Survey Inspector/Public water systems USACE Wetlands Delineation certification Alaska Department of Environmental Conservation Qualified Person AK Class A Commercial Drivers License with Hazardous Materials endorsement
Employment	1982 – Present Wray Petroleum Company – Exploration Geologist University of Alaska Fairbanks – Project manager/Superintendent Alaska Department of Environmental Conservation – Environmental Specialist III ENSR Environmental and Engineering – Environmental Geologist Lifewater Engineering – Environmental Geologist/Project Manager Boreal Environmental Services and Technology – Project Manager Alaska Resources and Environmental Services – Owner/Consultant
Technical Specialties	Project Management Environmental Compliance

Air, water, and solid waste permitting
Multimedia sampling (Air, Groundwater, Surface Water, Soil)
NEPA Environmental Impact Studies and Documentation
Environmental Baseline Surveys
Wetlands delineations and permitting
Pollution prevention
Phase I and II Environmental Site Assessments
Sampling and Analysis Plans
Field Screening/Contaminated Sites
Site Characterizations and Release Investigations
Groundwater and natural attenuation studies
Groundwater monitoring well development
Risk Assessment
Soil Logging/Sieve Analysis
Hazardous waste identification and compliance