

2018 Groundwater Monitoring Well Report
Formerly Kobuk Feed & Fuel
2751 Picket Place
Fairbanks, Alaska

ADEC File ID: 100.26.137

Prepared for:

Gary Lundgren

Prepared by:

**Alaska Resources and
Environmental Services, LLC.**



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Prepared
by:



Dustin Stahl
Environmental Specialist

**2018 Groundwater Monitoring Well Report
Former Kobuk Feed and Fuel Property / 2751 Picket Place**

INTRODUCTION

This report was prepared on behalf of Castle Properties, Inc and Gary Lundgren, who has contracted with Alaska Resources & Environmental Services (ARES) to perform the groundwater investigation associated with the petroleum release (Alaska Department of Environmental Conservation (ADEC) file #100.26.137). The work was conducted as detailed in the approved Work Plan submitted in September 2008. Deviations from the workplan to include the use of a bladder pump, and the collection of groundwater from MW-3 and MW-2 for volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAH) by method EPA 8270DSIM analysis were instituted based on ADEC recommendations.

The objective of the sampling event was to obtain groundwater sample data near the site of a former petroleum release in order to determine if the documented groundwater contamination on the property is naturally attenuating and if it is migrating off-site. Groundwater samples were collected from monitoring wells MW-1, MW-2, and MW-3 on August 16, 2017 in general accordance with ADEC Oil and Other Hazardous Substances Pollution Control Regulations (18 AAC 75 – amended July 1, 2017), ADEC Field Sampling Guidance August 2017, and the approved ADEC Work Plan dated September 2008.

Project Organization / Personnel

Castle Properties, Inc. is the current owner of the property. Ms. Cheryl Bagstad, on behalf of Mr. Gary Lundgren, is the contact for Castle Properties, Inc. The mailing address for Castle Properties, Inc is 18333 Bothell Way NE, #115 Bothell, WA 98011. The telephone number for Ms. Cheryl Bagstad is (425)-949-8921.

Test America Seattle performed laboratory analysis for VOC's and GRO in groundwater. Test America Seattle is approved by ADEC to provide testing of groundwater for hazardous substances and petroleum related contaminants. The mailing address for Test America Seattle is 5755 8th Street East, WA 98424. The telephone number for Test America Seattle is (253) 922-2310.

Test America Spokane performed laboratory analysis for DRO and PAH in groundwater. Test America Spokane is approved by ADEC to provide testing of groundwater for hazardous substances and petroleum related contaminants. The mailing address for Test America Spokane is 11922 East 1st Ave Spokane, WA 99206. The telephone number for Test America Spokane is (509) 924-9200.

The groundwater monitoring work described in this report was conducted by Alaska Resources & Environmental Services on July 20, 2018, by Mr. Jay Thomas, Environmental Technician for ARES. Mr. Thomas meets the qualifications of 'Qualified Environmental Professional' by the ADEC under 18 AAC 75. Mr. Dustin Stahl 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. Stahl is (907) 374-3226.

SITE BACKGROUND

Site Description

The property located at 2751 Picket Place is an industrial lot of approximately 109,335 square feet in size. The lot contains a gravel parking lot with no structures. The legal description for the site is: Tax Lot 1740 Section 17 Township 1 South Range 1 West. The elevation of the site is 439' above mean sea level.

History

The subject property was formerly a commercial agricultural feed and fuel supply facility referenced as Kobuk Feed and Fuel. It was owned and operated by Ken Ulz, who declared bankruptcy in 1993. A Phase I Site Assessment was reportedly conducted in 1993 by a prospective purchaser and a UST system was identified with fuel reportedly still in the tanks. There had been numerous surface spills and/or releases of fuel product reported at the site with an estimated 620 cubic yards of soil possibly impacted. There was no investigation of subsurface soils associated with potential leaks from the tanks and subsurface piping.

The property was transferred to the Alaska Department of Natural Resources (ADNR) as a result of a failure to fulfill the requirements of an Agriculture Revolving Loan Fund agreement. ADNR then offered the property for sale in 1996 "as is, where is" by sealed competitive bid. The successful bidder was Global Finance and Investment Co. Current tax records indicate it is now owned by Castle Residence Inns, Inc.

During excavation and removal of the four UST's in May 2007, petroleum-contaminated soils were encountered of which approximately 2,190 cubic yards of contaminated soils were removed and stockpiled on-site for remediation by land farming in accordance with the ADEC approved Work Plan. As confirmed by laboratory results, soil levels for GRO, DRO, and BTEX constituents were generally below ADEC target cleanup levels between the surface and 8' bgs on the sidewalls and end walls for both excavation pits following excavation and removal of contaminated soils. The lateral extent of contamination to the west however could not be determined. Laboratory results indicate petroleum-contaminated soils still remain along the west wall of the excavation. Excavation was forced to cease along the west wall once the property boundary limits were reached on the subject property.

The horizontal extent of contamination for the subject property was undetermined. Soils were excavated to a maximum depth of approximately 10' bgs. The seasonal high groundwater table for the surrounding area is generally 8' bgs. Sample results indicate that petroleum contaminated soils above ADEC target cleanup levels still exist within the vadose zone >8' below ground surface.

Information regarding field activities and initial Release Investigation is included in the ARES report titled *Phase II Environmental Site Assessment/ Release Investigation, Kobuk Feed and Fuel (Former) Property, July 2007*. Information regarding installation

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of permanent groundwater monitoring is included in the ARES report titled *Groundwater Monitoring Well Report, Kobuk Feed and Fuel Property, November 2008*.

Additional groundwater monitoring events were conducted by Alaska Resources and Environmental Services annually since 2008. A summary of recent and historical groundwater sampling data is included in Table 1 of this report. Trend analysis is included in Appendix B.

Topography

The United States Geological Survey (USGS) Fairbanks Quadrangle (D-2) SW provides topographic map coverage of the site (Figure 1). Fairbanks 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 2.5 miles north of the Tanana River and 1.5 miles south of the Chena River. Based upon the topographic map of the Fairbanks Quadrangle, the site elevation is approximately 439 feet above the mean sea level.

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 stage of nearby water bodies such as Chena Slough and Chena River typically rises and falls in response to stage changes of the Tanana 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 northwest. However, the direction of flow can vary depending upon the stage of the Tanana River. The seasonal high groundwater table for the surrounding area is generally 8' bgs.

Site Hydrology

The groundwater table at the time of sampling was approximately 9.7-10.7' below ground surface. (Depth to water (DTW) measurements on the Groundwater Monitoring Data Sheets include 3' of stickup casing height.) The presumed groundwater flow direction is to the northwest which is consistent with other data obtained in the area.

GROUNDWATER SAMPLING

Scope of Work

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

- Collected groundwater elevations and water quality parameter measurements to include temperature, pH, conductivity, oxidation reduction potential, and dissolved oxygen;
- Collection of groundwater samples and a duplicate sample. All samples were analyzed for gasoline range organics (GRO) by method AK 101, and diesel range organics (DRO) by method AK 102. Groundwater collected from MW1 was analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) by method EPA 8260C. Groundwater collected from MW-2 and MW-3 was analyzed for volatile

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organic compounds (VOCs) by method EPA 8260C/8260CSIM, and polycyclic aromatic hydrocarbons (PAH) by method EPA 8270DSIM; and

- Data review and report preparation.

Groundwater Sampling Procedures

A peristaltic pump with new disposable polyethylene tubing, and new nitrile gloves were used during the 2018 sampling event to purge the well while it stabilized and to collect groundwater for DRO and PAH analysis.

A bladder pump with new disposable polyethylene tubing, new disposable polyethylene bladders, and new nitrile gloves were used during the 2018 sampling event to collect groundwater for BTEX, GRO and VOC analysis. Before sampling and periodically during the purging process, the groundwater elevation was measured to 0.010 feet using a Heron Model D-T Interface Meter.

Groundwater was purged and sampled using low-flow techniques. For low-flow sampling, the goal is minimum drawdown (<0.3 feet) during purging. A flow rate of 0.15-0.4 L/minute was measured and maintained throughout the purging process. Water quality parameters, were obtained using a flow-through-cell and a YSI Model 556 multi-parameter water meter. Additionally, water quality parameters were measured and recorded on dedicated water parameter sheets while purging each monitoring well.

Water parameters were monitored and recorded every three minutes until purging was completed. Purging continued until water parameter measurements indicated that the well had stabilized.

The following water quality parameters are considered stable when three successive readings, collected 3-5 minutes apart, are within:

- $\pm 3\%$ for temperature (minimum of $\pm 0.2^{\circ}\text{C}$);
- ± 0.1 for pH;
- $\pm 3\%$ for conductivity;
- ± 10 mv for redox potential; and
- $\pm 10\%$ for dissolved oxygen (DO).

Once the groundwater parameters stabilized, samples were collected in order of decreasing volatility. Groundwater was collected directly from the pump tubing and was placed directly into lab supplied sample bottles. Volatile samples were collected with care 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 an ADEC approved laboratory (Test America) following chain of custody (COC) procedures.

Purge water was placed into individually labeled 5-gallon buckets with lids and stored offsite in ARES warm storage until analytical results were received. Once the analytical results were received, all purge water that was below ADEC cleanup level was discharged onto the ground surface. Purge water exceeding ADEC cleanup levels was transported to OIT for treatment by thermal remediation. Disposal documentation is included in Appendix F.

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Groundwater samples were collected from MW-1, MW-2, and MW-3 on July 20, 2018. A blind duplicate sample was collected from monitoring well MW-3 for quality assurance/quality control purposes.

Field Observations

Purge water from MW-1 was clear to slightly brown in appearance. It did not have a noticeable odor.

The purge water from MW-2 was clear in appearance. No odor was observed from the purge water.

Purge water from MW-3 was slightly brown in appearance. A slight petroleum odor was observed from the purge water at monitoring well MW-3. The well did not recover at the initial flow rate used for other wells and the flow rate was adjusted to 0.15 L/minute in order to not draw down the well. The screen of the galvanized steel well has likely rusted over time reducing the recovery rate of the well. Similar problems were noted with MW-3 during the 2017 sampling event. The screen of MW-3 was surged and purged in 2017 and the flow rate improved.

Groundwater measurements taken during the August 2017 sampling event indicated that the water table was approximately 9.7-10.7' below ground surface at the time of sampling. (DTW measurements on the Groundwater Monitoring Data Sheets include 3' of stickup casing height.)

Analytical Results

All three monitoring wells were sampled and analyzed for GRO by method AK101 and DRO by method AK102. MW-1 was sampled for BTEX by method EPA 8260C. MW-2 and MW-3 were sampled for VOC's by method EPA 8260C/8260CSIM and PAH by method EPA 8270DSIM. A summary of current and historical sample results for GRO, DRO, benzene, toluene, ethylbenzene, and total xylenes (BTEX) is listed in Table 1. A summary table of all analytical results (including VOC and PAH results) is included in Appendix D. Complete laboratory results are included in Appendix C.

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Table 1 - Historical Summary of BTEX, GRO, and DRO Groundwater Results

Sample Location	Sample ID	Date Sampled	EPA Method 8021B or 8260B				Alaska Method AK 101	Alaska Method AK 102
			Benzene in µg/L*	Toluene in µg/L*	Ethylbenzene in µg/L*	Total xylenes in µg/L*	GRO in µg/L*	DRO in µg/L*
MW-1	MW1-K-1008	10/22/2008	ND	ND	ND	ND	ND	ND
	MW1-K-0809	08/20/2009	ND	ND	ND	ND	N/A	480
	MW1-911	09/14/2011	1.24	ND	ND	ND	ND	ND
	MW1-1012	10/17/2012	1.77	ND	ND	ND	ND	ND
	MW1-K-0713	07/22/2013	0.772	ND	ND	ND	ND	ND
	MW1-K-0814	08/13/2014	ND	ND	ND	ND	68 B	38 B
	MW1-K-0915	09/22/2015	3.92	ND	5.20 J	2.23 J	40.0 J	439 J
	MW1-1016	10/25/2016	1.69	ND	ND	ND	ND	283
	MW1-0817	08/16/2017	ND	ND	ND	ND	ND	270
MW1-718	07/20/2018	ND [3.0]	ND [2.0]	ND [3.0]	ND [5.0]	100 J QH	ND [250]	
MW-2	MW2-K-1008	10/22/2008	96.4	19.4	262	268	5410	1310
	DUP-K-1008 Blind field duplicate sample to MW2-K-1008	10/22/2008	93.2	18.2	250	254	5020	1670
	MW2-K-0809	08/20/2009	98.6	ND	32.6	55.8	N/A	460
	MW2-911	09/14/2011	32.2	31.0	36.0	51.3	1930	444
	DUP1-911 Blind field duplicate sample to MW2-911	09/14/2011	34.1	34.0	41.8	65.4	2160	549
	MW2-1012	10/17/2012	31.4	20.8	44.3	53	2830	631
	MW2-K-0713	07/22/2013	51.2	47.0	33.5	131	1500	859
	MW2-K-0814	08/13/2014	21	4.9	7.5	22	2200 B	1200 B
	MW2-K-0915	09/22/2015	21.1	5.47	22.8	60.6	808	785
	MW2-1016	10/25/2016	24.7	4.51	30.0	59.6	656	2750
	MW2-0817	08/16/2017	23 H	3.6	14	44.3	840 J	940
	DUP-0817 Blind field duplicate sample to MW2-0817	08/16/2017	22 H	2.9	11	33.1	1100	930
	MW2-718	07/20/2018	20	15	20	72	790 H	460 QN
ADEC Cleanup Level ¹			4.6	1100	15	190	2200	1500

¹ Title 18 of the Alaska Administrative Code, Chapter 75. Section 345.

ND = Not detected at or above the method reporting limit.

B=Analyte was detected in the associated blank and sample

J=Result is less than the Reporting Limit (RL) but greater than the MDL. The concentration is an estimated value

H=Sample was prepped or analyzed beyond the specified holding limit

QH= Result is an estimate biased high due to a QC failure

QN= Result is an estimate with uncertain bias due to a QC failure

N/A = Not Analyzed.

Results above ADEC Regulatory Limit in **Bold**.

(Table 1 is continued on the next page)

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Table 1 (Continued) - Historical Summary of BTEX, GRO, and DRO Groundwater Results

Sample Location	Sample ID	Date Sampled	EPA Method 8021B or 8260B				Alaska Method AK 101	Alaska Method AK 102
			Benzene in µg/L*	Toluene in µg/L*	Ethylbenzene in µg/L*	Total xylenes in µg/L*	GRO in µg/L*	DRO in µg/L*
MW-3	MW3-K-1008	10/22/2008	37.9	9.00	605	1530	7910	11600
	MW3-K-0809	08/20/2009	59.4	ND	471	1060	N/A	3040
	DUP-K-0809 Blind field duplicate sample to MW3-K-0809	08/20/2009	59.4	ND	515	1170	N/A	3260
	MW3-911	09/14/2011	11.4	9.72	266	1350	5760	3910
	MW3-1012	10/17/2012	7.27	4.97	364	1430	13400	28500
	DUP1-1012 Blind field duplicate sample to MW3-1012	10/17/2012	6.53	4.65	245	1190	11000	24400
	MW3-K-0713	07/22/2013	4.27	13.0	192	668	2640	7340
	DUP-K-0713 Blind field duplicate sample to MW3-K-0814	07/22/2013	4.13	10.7	179	756	2540	5840
	MW3-K-0814	08/13/2014	0.83	1.5	86	320	2800	6100 B
	DUP-K-0814 Blind field duplicate sample to MW3-K-0814	08/13/2014	0.84	1.3	79	300	4000	6100 B
	MW3-K-0915	09/22/2015	1.76	1.18	57.5	344	1470	3440
	DUP-K-0915 Blind field duplicate sample to MW3-K-0915	09/22/2015	2.15	1.20	57.8	343	1650	3890
	MW3-1016	10/25/2016	0.500	0.600 J	33.9	246	1230	5020
	DUP-1016	10/25/2016	0.470	0.580 J	34.2	242	1250	5990
	MW3-0817	08/16/2017	0.29 J H	0.44 J	27	130	1100	4400
MW3-718	07/20/2018	0.16 J	ND [2.0]	9.5	86	800 H QH	5100 QN	
D-718	07/20/2018	0.19 J	ND [2.0]	9.6	88	830 H QH	1400 QN	
ADEC Cleanup Level ¹			4.6	1100	15	190	2200	1500

¹ Title 18 of the Alaska Administrative Code, Chapter 75, Section 345.

ND = Not detected at or above the method reporting limit.

B=Analyte was detected in the associated blank and sample

J=Result is less than the Reporting Limit (RL) but greater than the MDL. The concentration is an estimated value

H=Sample was prepped or analyzed beyond the specified holding limit

QH= Result is an estimate biased high due to a QC failure

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N/A = Not Analyzed.

Results above ADEC Regulatory Limit in **Bold**.

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Blind Duplicate Samples

Field quality control (QC) procedures for this project included the collection and analysis of a field duplicate sample. One field duplicate (D-718) was collected from MW-3 for quality control purposes. Sample D-718 was a blind field duplicate to MW3-718. 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 to provide an un-biased measure of precision. Due to the nature of the RPD calculation, sample data for both samples must be reported for the RPD calculation to provide meaningful data. RPD calculations are computed for all compounds that had laboratory reported detections above the MDL for both samples. RPD calculations for all analytes with calculable RPD's are shown in Table 2 below.

Table 2: Relative Percent Difference Calculations

Sample ID / Duplicate ID	Compound	Sample Concentration (µg/L water)	Duplicate Concentration (µg/L water)	RPD (%)
MW2-0817/ DUP-0817	GRO	800	830	3.7
	DRO	5100	1400	113.8
	Benzene	0.16	0.19	17.1
	Ethylbenzene	9.5	9.6	1.0
	Total Xylenes	86	88	2.3
	1-Methylnaphthalene	24	32	28.6
	2-Methylnaphthalene	20	32	46.2
	Acenaphthene	23	24	4.3
	Benzo[a]anthracene	0.14	0.34	83.3
	Indeno[1,2,3-cd]pyrene	1.3	1.6	20.7
	Phenanthrene	0.38	1.5	119.1
	1,2,4-Trimethylbenzene	81	82	1.2
	1,2,5-Trimethylbenzene	35	36	2.8
	4-Isopropyltoluene	4.6	4.6	0.0
	Isopropylbenzene	9.6	9.4	2.1
	m-Xylene & p-Xylene	59	60	1.7
	o-Xylene	27	28	3.6
	n-Butylbenzene	6.2	6	3.3
	n-Propylbenzene	12	12	0.0
	Sec-butylbenzene	3.4	3.2	6.1
t-Butylbenzene	0.64	0.65	1.6	
Naphthalene (8260C)	33	33	0.0	

Given two sample concentrations (X and Y) the formula to determine RPD is the absolute value of the following:

$$[((X - Y) / ((X + Y) / 2)) * 100 = \text{RPD}$$

Results above ADEC recommended range in **Bold**.

The ADEC limit for field duplicate RPD is 30% in water. All calculated field duplicate RPDs fell below the ADEC limit of 30% in water with the exception of DRO (113.8%), 2-Methylnaphthalene (46.2%), Benzo[a]anthracene (83.3%), and Phenanthrene (119.1%). Data quality is affected. Results for analytes with RPD exceedances should be viewed

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qualitatively rather than quantitatively. Affected results are qualified with the QN data flag in the analytical summary tables. The data is still usable. Data quality and usability of all other analytes is not affected by the RPD errors.

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 limit of quantitation (LOQ). A result above the LOQ can indicate that cross-contamination occurred between samples during sample transport or analysis, or indicate laboratory contamination.

The trip blank sample was analyzed for GRO by AK 101 and BTEXs by EPA 8260C. Analysis for VOC's by EPA 8260C/8260CSIM was not performed on the Trip blank because it was mistakenly not requested on the COC.

No analytes were detected above the LOQ 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 2009) and United States Environmental Protection Agency (EPA) National Functional Guidelines for Organic Review (EPA 2018) were followed in this site investigation. The data was 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 Seattle laboratory of Tacoma, WA. The analytical laboratory report, chain-of-custody record, and the ADEC Laboratory Data Review Checklist are included in Appendix C.

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 limits of quantitation (LOQ)

Test America Job ID # 580-79064-1

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All reviewed quality control parameters were met for this analytical sampling event with the following exceptions:

- Method(s) AK 101-Samples MW2-718, MW3-718, and D-718 were re-analyzed outside of hold time due to QC failures in the initial analysis.
- Method(s) 8260C/8260CSIM: 1,2,3-Trichloropropane, 1,1,2-Trichloroethane, 1,2-Dibromoethane, and Vinyl chloride have detection limits that exceed ADEC clean up levels (CUL's) in one or more samples. Analytes with elevated detection limits could be present at concentrations that exceed ADEC cleanup levels. Data is still usable. Sample results with detection limits that exceed ADEC CUL's are highlighted in blue in the analytical summary table.
- Method(s) 8260C SIM- The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 580-280485 recovered outside control limits for the following analytes: Vinyl chloride and Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.
- Method(s) 8260C SIM- The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 580-280485 recovered outside control limits for the following analytes: Bromomethane. The RPD exceeded the upper control limit and the associated analytes were not detected in the samples.
- Method(s) AK101- Surrogate recovery for the following samples were outside control limits: MW1-718 (580-79064-1), MW3-718 (580-79064-3) and D-718 (580-79064-4). Evidence of matrix interference is present. Data quality is affected. All the surrogates recovered above the upper acceptance limit. Detected analytes are considered biased high and are qualified with the QH data flag. Data is usable.
- Method(s) 8270D SIM- Surrogate recovery for the following samples were outside control limits: MW3-718 (580-79064-3) and D-718 (580-79064-4). Evidence of matrix interference due to non-target analytes is present. Sample D-718 data quality is affected. The surrogate recovered low due to a required 10X dilution. Detected sample results and non-detects have an uncertain bias and are qualified with the QN data flag. Sample MW3-718 data quality is affected. The surrogate recovered above the upper acceptance limit. Detected sample results are considered biased high and are qualified with the QH data flag. If the result was previously qualified with the QN data flag due to other QC errors the QN qualifier remains. Non-detect results do not require qualification. Data is still usable.
- Method(s) 8260C/8260CSIM- The trip blank was not analyzed for VOC's by 8260C/8260CSIM, because the analysis was not requested on the COC in error. The Trip Blank was still analyzed for BTEX by 8260C and GRO by AK 101. Data quality is affected. There is no way to determine if cross contamination could have occurred for any VOC analytes that were detected in the samples. Data is still usable.
- The calculated Sample/Blind Field Duplicate RPD's for DRO (113.8%), 2-Methylnaphthalene (46.2%), Benzo[a]anthracene (83.3%), and Phenanthrene exceeded the recommended RPD limit of 30% in water. Data quality is affected. Results from analytes with RPD failures should be viewed qualitatively rather than quantitatively. Results are qualified with a QN flag in the analytical summary table.

Data quality is affected by the QC failures as outlined in the above bullet points. Data is still usable. Data quality and usability are not affected for other methods and analytes.

Conclusions and Recommendations

Analytical results from MW-1 groundwater samples continue to demonstrate levels below ADEC cleanup levels for all analytes.

Analytical results from groundwater collected from MW2 were below ADEC cleanup levels for all tested analytes with the following exceptions:

- Benzene- 20 µg/L
- Ethylbenzene- 20 µg/L
- Naphthalene (8270D)- 2.7 µg/L
- Naphthalene (8260CSIM)- 5.2 µg/L

The detected concentrations of GRO, DRO, Benzene, Naphthalene, and Indeno[1,2,3]pyrene in MW-2 have all decreased since the previous sampling event. All of these analytes show a general decreasing trend with the exception of DRO and Indeno[1,2,3]pyrene.

Indeno[1,2,3]pyrene had a significant spike in concentration during the 2017 sampling event causing it to exceed CULs. The detected concentration of Indeno[1,2,3]pyrene was significantly lower in the 2016 and 2018 sampling events and was below ADEC CUL's.

Although concentrations of DRO have decreased in MW-2 since the previous sampling event, DRO concentrations in the well have gradually trended higher since 2009. This is likely the results of downgradient contamination migrating to the well.

The detected concentrations of Ethylbenzene in MW-2 have increased since the previous sampling event.

Analytical results from groundwater collected from MW3 were below ADEC cleanup levels for all tested analytes with the following exceptions:

- DRO- 5100 µg/L
- 1-Methylnaphthalene- 24 µg/L
- Benzo[a]anthracene- 0.34 µg/L
- Indeno[1,2,3-cd]pyrene- 1.6 µg/L
- Naphthalene- 33 µg/L
- 1,2,4-Trimethylbenzene- 82 µg/L

The concentrations of GRO, Naphthalene, Ethylbenzene, and Total Xylenes have decreased in MW-3 since the 2017 sampling event. Concentrations of Ethylbenzene no longer exceed ADEC CUL's.

The concentrations of DRO and 1-Methylnaphthalene have increased slightly since the 2017 sampling event.

All of the analytes that exceed ADEC CUL's in MW-3 have shown a general decreasing trend over time. It is likely that the plume is moving down gradient. The increase of DRO in downgradient MW-2 is a strong indicator of this migration. Due to the close proximity

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of MW-2 and MW-3 to the north and west property lines it is likely that the plume has moved offsite.

MW2 is located adjacent to the former site of two (2) 10,000-gallon gasoline UST's. MW3 is located adjacent to the former site of one (1) 10,000-gallon gasoline UST and one (1) 5,000-gallon diesel UST.

Field technicians have observed slow recovery in MW-3 on consecutive years. It is likely that the galvanized metal screen is rusting and slowing recovery. All the monitoring wells at the site are galvanized metal with a cut screen. This type of well is much more inexpensive to install as it can be jackhammered in place without the use of a drill rig, but this well type is not ideal for long term monitoring due to screen deterioration over time. It is likely that MW-3 (and possibly MW2 and MW1) is approaching the end of its serviceable use. If additional wells are installed in the future, the value of replacing MW-3 should be evaluated.

ARES recommends the following:

- Schedule an additional annual groundwater sampling event during period of high seasonal groundwater conditions (August 2019). Groundwater collected from all wells should be analyzed for GRO by method AK101 and DRO by method AK 102. Groundwater collected from MW1 should analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) by method EPA 8260C. Groundwater collected from MW-2 and MW-3 should be analyzed for volatile organic compounds (VOCs) by method EPA 8260C, and polycyclic aromatic hydrocarbons (PAH) by method EPA 8270DSIM;
- Contaminants are likely migrating off-site. Additional down-gradient samples (soil/water) would need to be collected to determine the extent of the contaminant plume. ARES recommends additional soil borings and well points/groundwater monitoring wells be placed down-gradient to assess potential impacts. If additional wells are installed, ARES recommends replacement of MW-3. Monitoring wells installed on adjacent properties would require permission from the property owners and be installed in accordance with an ADEC approved workplan; and
- A well receptor survey should be conducted to identify potential receptors within a 1/4 mile down-gradient and cross gradient of the Subject Property. Figure 2 Appendix A identifies all the properties within 0.25 miles of the source area.

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 analyses were performed. No conclusions can be drawn about the presence or absence of other contaminants. This is not a geotechnical study.

2018 Groundwater Monitoring Well Report
Former Kobuk Feed and Fuel Property / 2751 Picket Place

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 Castle Properties, Inc, Gary Lundgren, 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

Dustin Stahl is an ADEC 'Qualified Environmental Professional' and has extensive field experience as an environmental Project Manager and has worked on all aspects of environmental assessments, release investigations, and clean-up efforts.

Dustin Stahl / Environmental Specialist

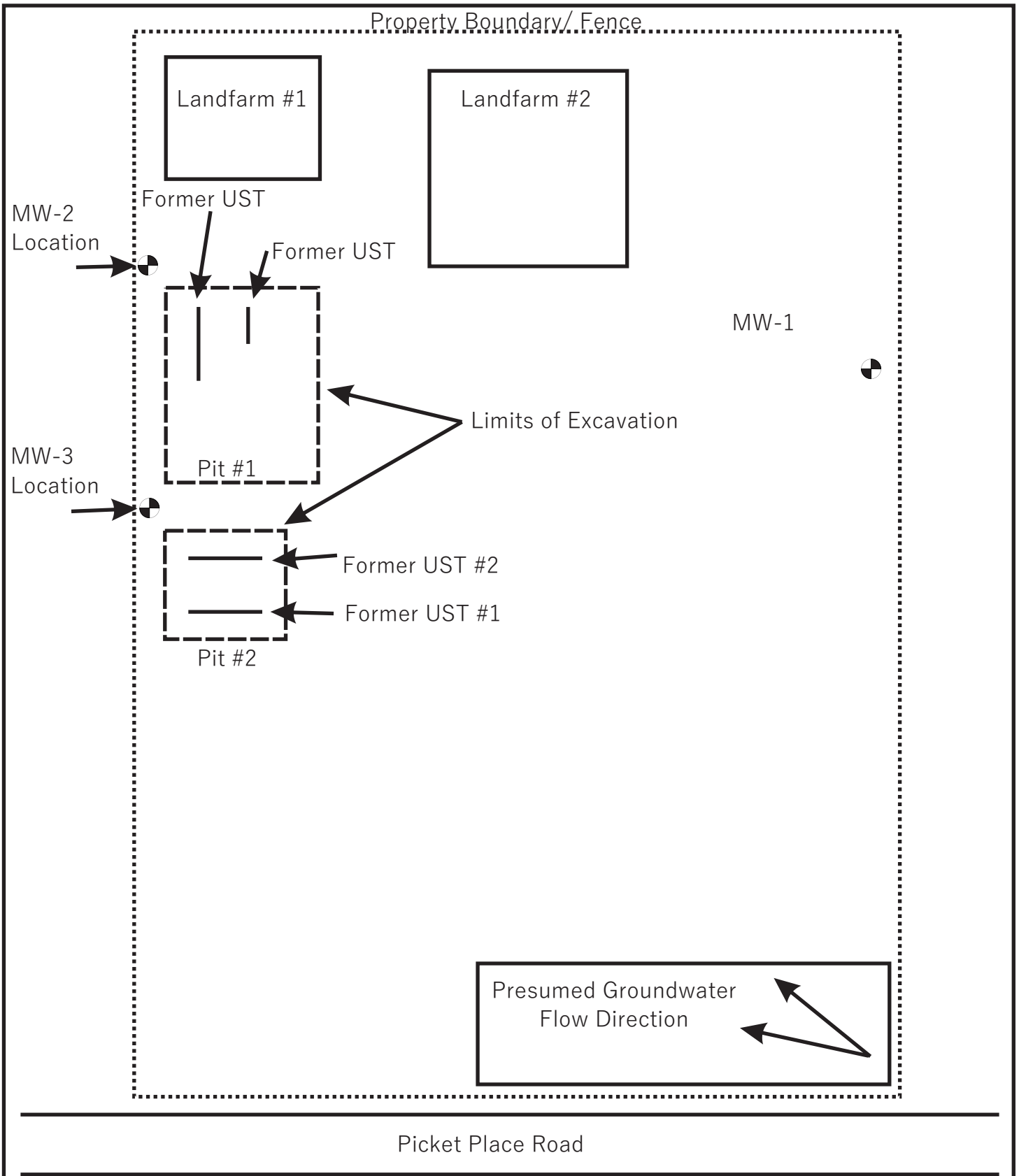


Alaska Resources and Environmental Services, LLC

Attachments: Appendix A – Figures
Appendix B – Graphical Trend Analysis of Analytical Results Over Time
Appendix C – Analytical Results and ADEC Laboratory Checklist
Appendix D – Analytical Summary Table
Appendix E – Field Notes and Well Data Sheets
Appendix F – Disposal Documents

Appendix A:

Figures



Site Map

Scale in Feet:

0 25 50 100

**2018 Groundwater
Monitoring Well
Report**
2751 Picket Place
 February 2019

FIGURE 1

ARES
 Alaska Resources and
 Environmental Services, LLC
 3520 International Street
 Fairbanks AK 99701



KEY

Properties within the yellow circle are within 0.25 miles of the source area. Down gradient and cross gradient properties require a drinking water well search to be performed.



Alaska Resources and Environmental Services, LLC
 3520 International St. Fairbanks, AK 99701
 PH. (907) 374-3226

DRINKING WATER
 WELL SEARCH RADIUS
 MAP



DATE: 2/15/19	PROJECT: FORMER KOBUK FEED AND FUEL 2751 PICKET PLACE, FAIRBANKS, ALASKA
DRAWN: DJS	
SCALE IN FEET: 0 250 500 750 1000	

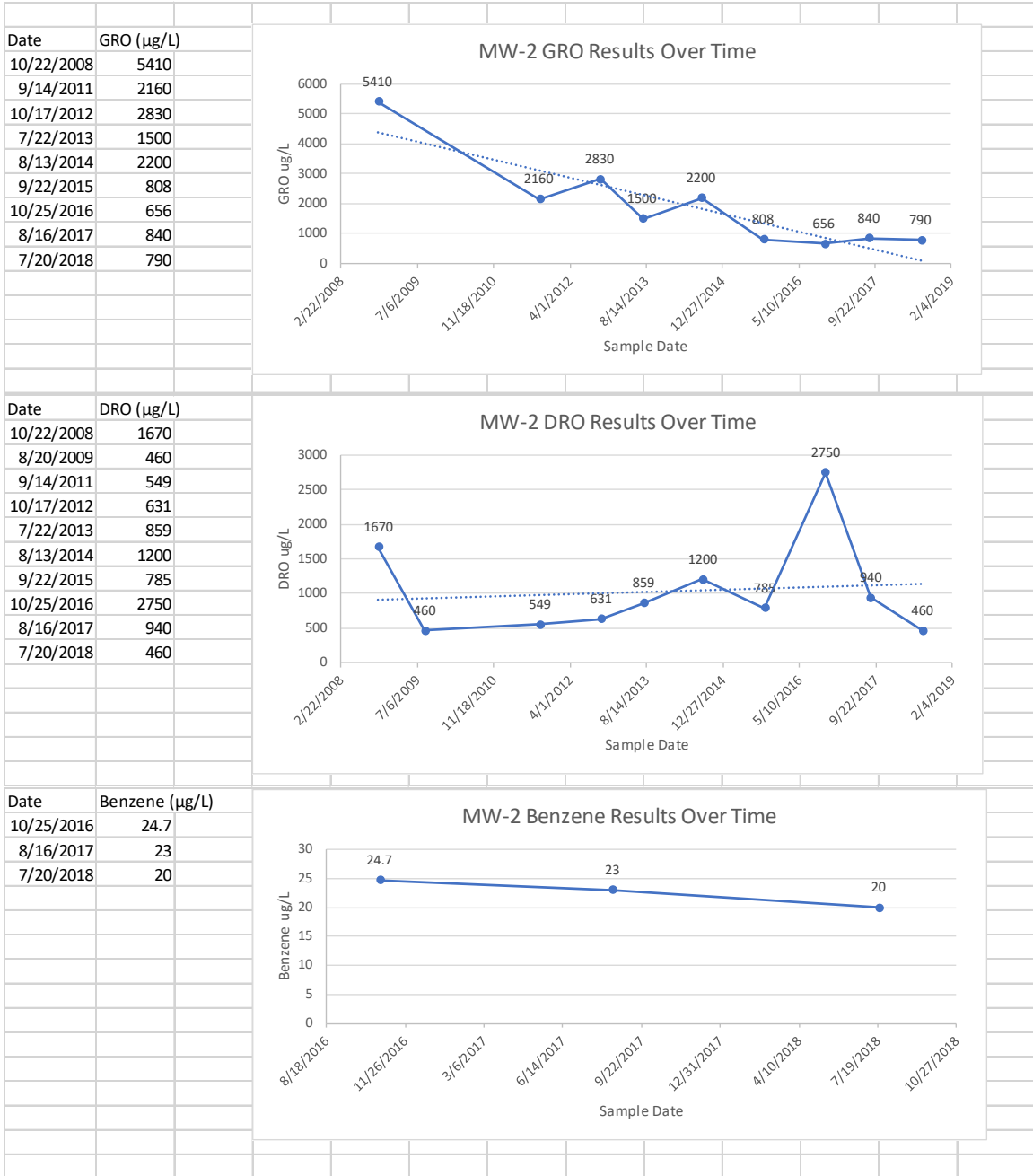
FIGURE
2

Appendix B:
Graphical Trend Analysis of Analytical Results Over
Time

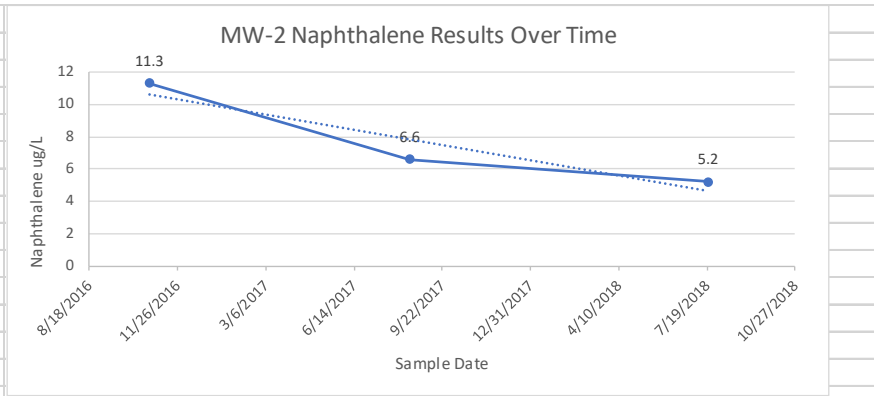
MW-1

Not enough detected results to establish meaningful graphical representation of results for any tested analytes.

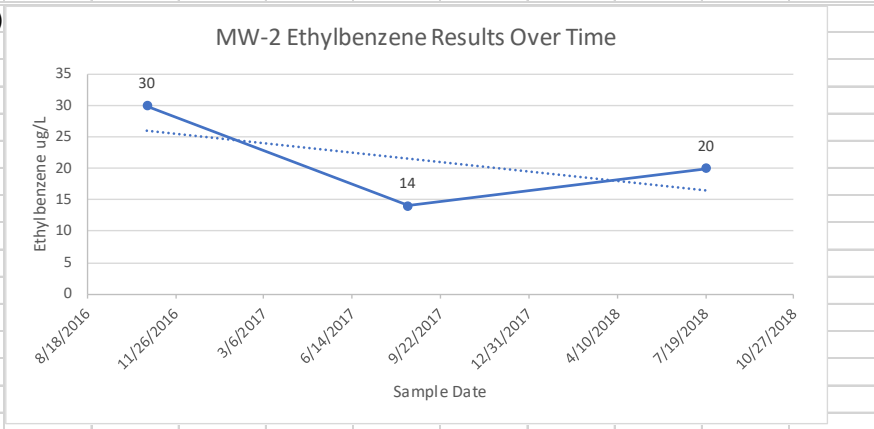
MW-2



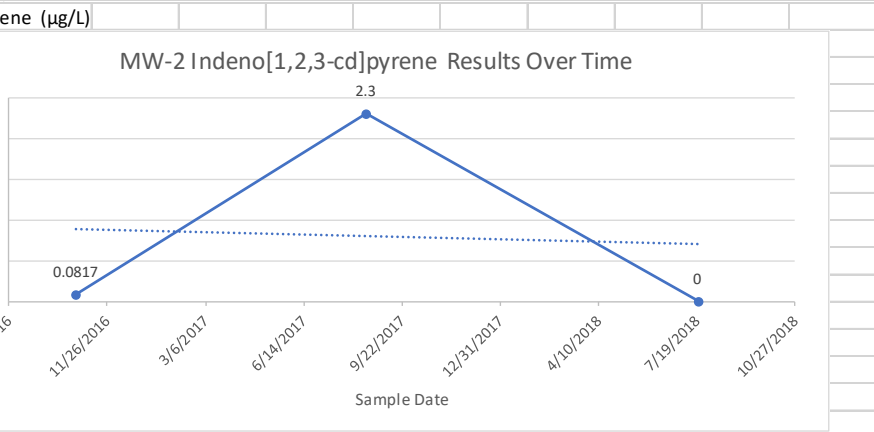
Date	Naphthalene (µg/L)
10/25/2016	11.3
8/16/2017	6.6
7/20/2018	5.2



Date	Ethylbenzene (µg/L)
10/25/2016	30
8/16/2017	14
7/20/2018	20

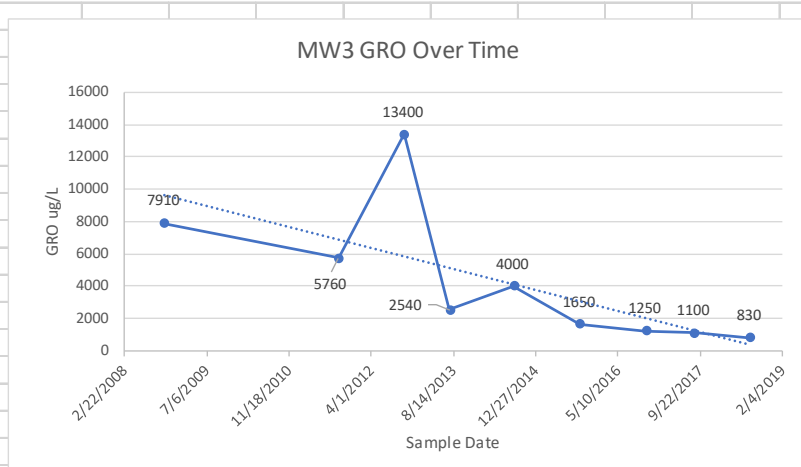


Date	Indeno[1,2,3-cd]pyrene (µg/L)
10/25/2016	0.0817
8/16/2017	2.3
7/20/2018	0

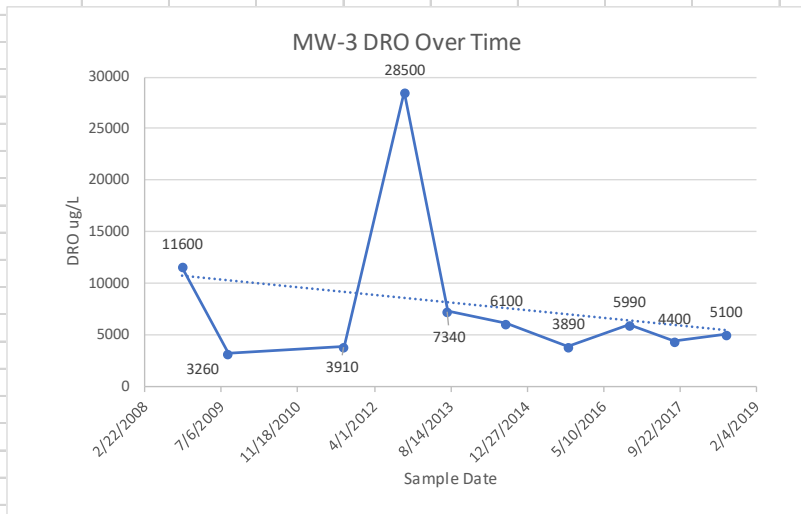


MW-3

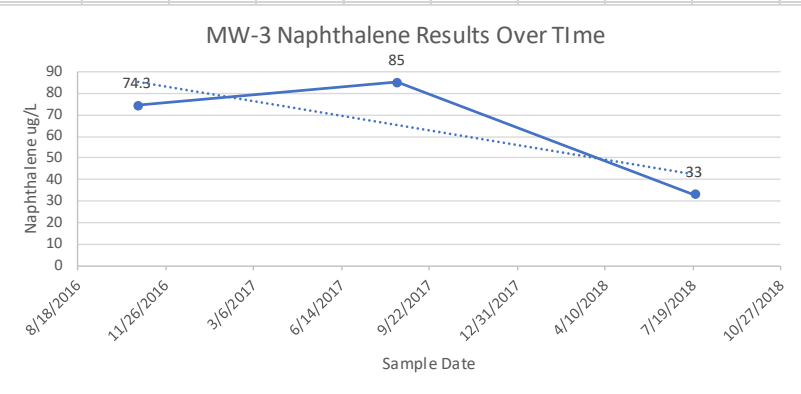
Date	GRO (µg/L)
10/22/2008	7910
9/14/2011	5760
10/17/2012	13400
7/22/2013	2540
8/13/2014	4000
9/22/2015	1650
10/25/2016	1250
8/16/2017	1100
7/20/2018	830



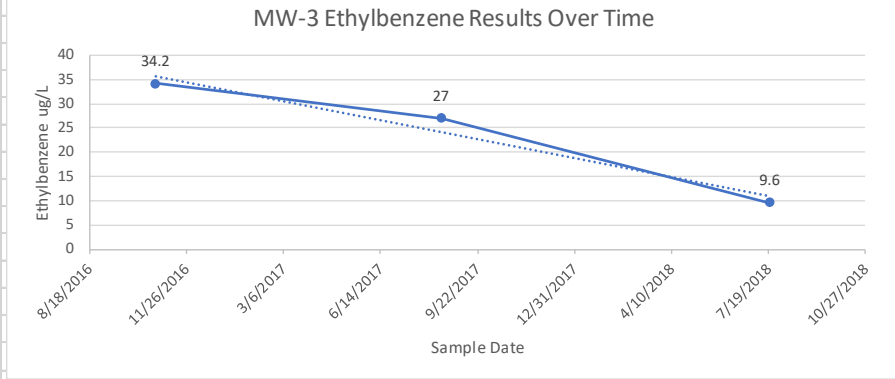
Date	DRO (µg/L)
10/22/2008	11600
8/20/2009	3260
9/14/2011	3910
10/17/2012	28500
7/22/2013	7340
8/13/2014	6100
9/22/2015	3890
10/25/2016	5990
8/16/2017	4400
7/20/2018	5100



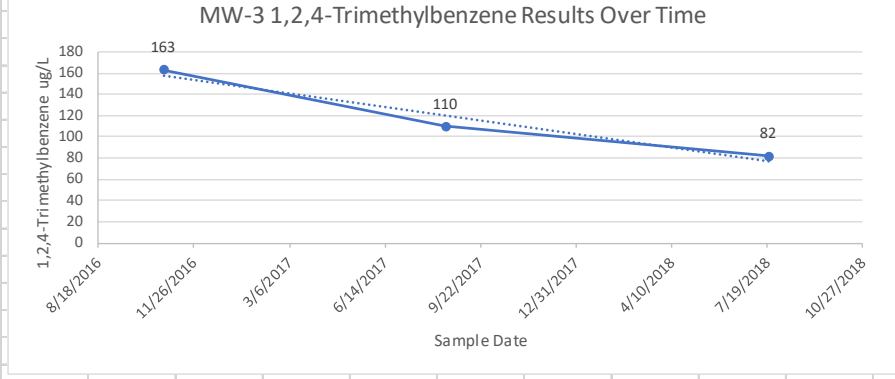
Date	Naphthalene (µg/L)
10/25/2016	74.3
8/16/2017	85
7/20/2018	33



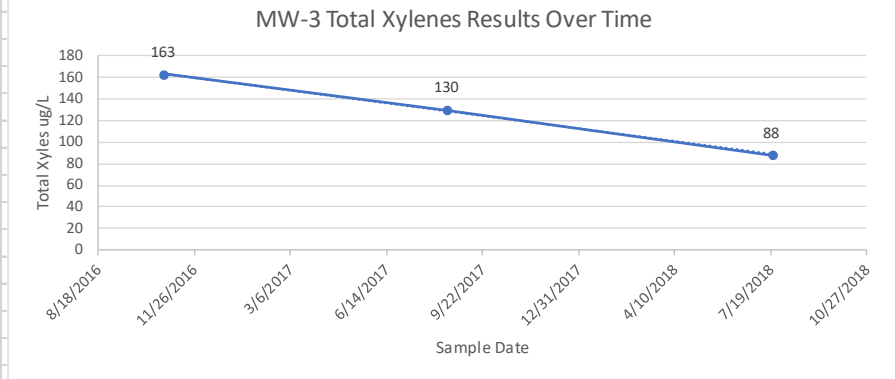
Date	Ethylbenzene ($\mu\text{g/L}$)
10/25/2016	34.2
8/16/2017	27
7/20/2018	9.6



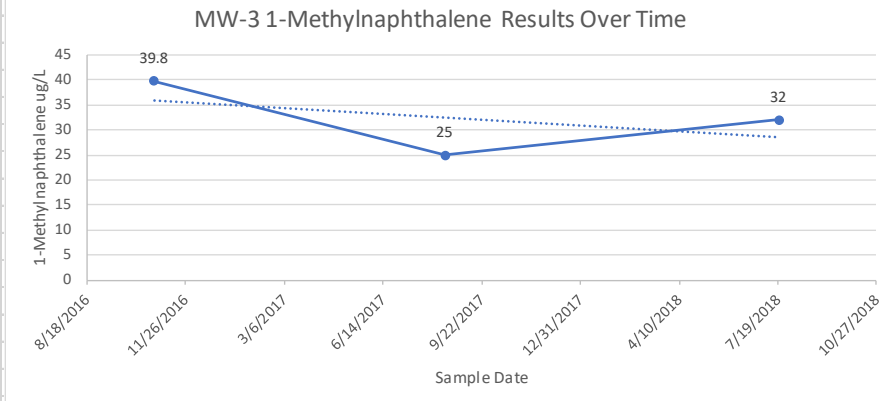
Date	1,2,4-Trimethylbenzene ($\mu\text{g/L}$)
10/25/2016	163
8/16/2017	110
7/20/2018	82

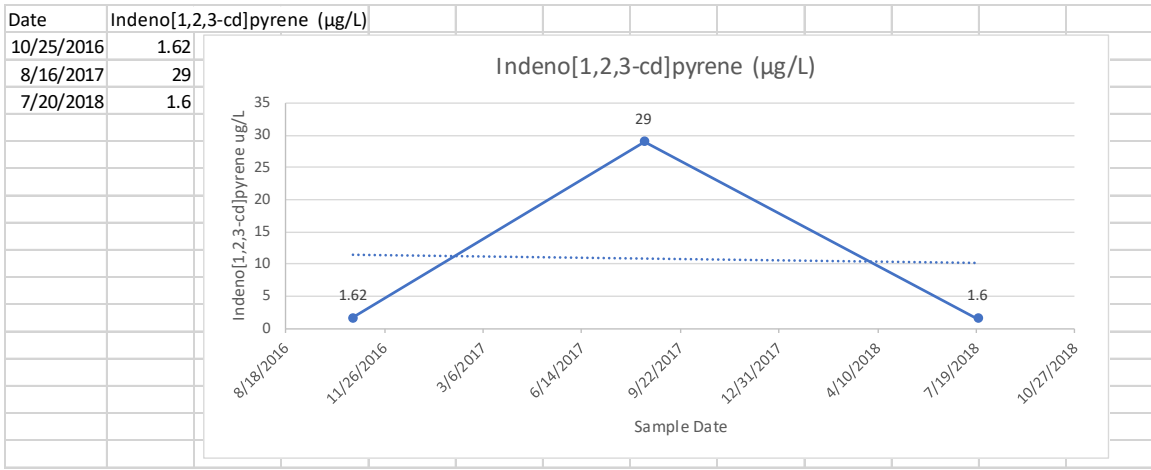


Date	Total Xylenes ($\mu\text{g/L}$)
10/25/2016	163
8/16/2017	130
7/20/2018	88



Date	($\mu\text{g/L}$)
10/25/2016	39.8
8/16/2017	25
7/20/2018	32





Appendix C:
Analytical Results
&
ADEC Lab Quality Checklist

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79064-1

Client Project/Site: Kobuk Feed & Fuel

For:

Alaska Resources & Environment
PO BOX 83050
Fairbanks, Alaska 99708

Attn: Lyle Gresehover

M. Elaine Walker

Authorized for release by:
8/13/2018 4:57:45 PM

Elaine Walker, Project Manager II
(253)248-4972
elaine.walker@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

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

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11



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Case Narrative

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Job ID: 580-79064-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative 580-79064-1

Receipt

Five samples were received on 7/24/2018 12:50 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA

Method(s) 8260C SIM: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 580-280485 recovered outside control limits for the following analytes: Vinyl chloride and Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method(s) 8260C SIM: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 580-280485 recovered outside control limits for the following analytes: Bromomethane.

Method(s) 8260C SIM: Sample reanalyzed due to quality control failure in the initial analysis. MW2-718 (580-79064-2).

Method(s) AK101: The following samples were analyzed outside of analytical holding time due to quality control failures in the initial analysis: MW2-718 (580-79064-2), MW3-718 (580-79064-3) and D-718 (580-79064-4).

Method(s) AK101: Surrogate recovery for the following samples were outside control limits: MW1-718 (580-79064-1), MW3-718 (580-79064-3) and D-718 (580-79064-4). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA

Method(s) 8270D SIM: Surrogate recovery for the following samples were outside control limits: MW3-718 (580-79064-3) and D-718 (580-79064-4). Evidence of matrix interference due to non-target analytes is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
*	LCS or LCSD is outside acceptance limits.
*	RPD of the LCS and LCSD exceeds the control limits

GC/MS Semi VOA

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

GC VOA

Qualifier	Qualifier Description
X	Surrogate is outside control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

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

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW1-718

Date Collected: 07/20/18 12:50

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0	0.53	ug/L			07/26/18 22:50	1
Toluene	ND		2.0	0.39	ug/L			07/26/18 22:50	1
Ethylbenzene	ND		3.0	0.50	ug/L			07/26/18 22:50	1
m-Xylene & p-Xylene	ND		3.0	0.75	ug/L			07/26/18 22:50	1
o-Xylene	ND		2.0	0.15	ug/L			07/26/18 22:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		80 - 122		07/26/18 22:50	1
Trifluorotoluene (Surr)	107		80 - 120		07/26/18 22:50	1
4-Bromofluorobenzene (Surr)	104		80 - 125		07/26/18 22:50	1
Dibromofluoromethane (Surr)	103		77 - 120		07/26/18 22:50	1
1,2-Dichloroethane-d4 (Surr)	98		80 - 126		07/26/18 22:50	1

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	0.10	J	0.25	0.10	mg/L			07/29/18 14:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	134	X	68 - 119		07/29/18 14:31	1

Method: AK102 - DRO

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.25	0.091	mg/L		07/26/18 13:56	07/26/18 15:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	95		50 - 150	07/26/18 13:56	07/26/18 15:10	1
n-Triacontane-d62	96		50 - 150	07/26/18 13:56	07/26/18 15:10	1

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW2-718

Lab Sample ID: 580-79064-2

Date Collected: 07/20/18 14:10

Matrix: Water

Date Received: 07/24/18 12:50

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.0090	ug/L			07/31/18 13:19	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.14	ug/L			07/31/18 13:19	1
1,1,2-Trichloroethane	ND		0.50	0.017	ug/L			07/31/18 13:19	1
1,1-Dichloroethene	0.24	J	0.50	0.037	ug/L			07/31/18 13:19	1
1,2-Dibromoethane	ND		0.50	0.014	ug/L			07/31/18 13:19	1
1,2-Dichloroethane	0.18	J	0.50	0.037	ug/L			07/31/18 13:19	1
1,4-Dichlorobenzene	ND		0.50	0.058	ug/L			07/31/18 13:19	1
Benzene	20		0.50	0.032	ug/L			07/31/18 13:19	1
Bromodichloromethane	ND		0.50	0.040	ug/L			07/31/18 13:19	1
Bromoform	ND		0.50	0.073	ug/L			07/31/18 13:19	1
Bromomethane	ND	*	0.50	0.017	ug/L			07/31/18 13:19	1
Chloroform	ND		0.50	0.033	ug/L			07/31/18 13:19	1
cis-1,3-Dichloropropene	ND		0.50	0.038	ug/L			07/31/18 13:19	1
Dibromochloromethane	ND		0.50	0.052	ug/L			07/31/18 13:19	1
Dibromomethane	ND		0.50	0.017	ug/L			07/31/18 13:19	1
Hexachlorobutadiene	ND		0.50	0.16	ug/L			07/31/18 13:19	1
Naphthalene	5.2		0.50	0.18	ug/L			07/31/18 13:19	1
Tetrachloroethene	0.19	J	0.50	0.032	ug/L			07/31/18 13:19	1
trans-1,3-Dichloropropene	ND		0.50	0.044	ug/L			07/31/18 13:19	1
Trichloroethene	0.055	J	0.50	0.032	ug/L			07/31/18 13:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		48 - 150		07/31/18 13:19	1
4-Bromofluorobenzene (Surr)	100		75 - 120		07/31/18 13:19	1
Dibromofluoromethane (Surr)	104		80 - 120		07/31/18 13:19	1
Toluene-d8 (Surr)	98		75 - 120		07/31/18 13:19	1
Trifluorotoluene (Surr)	103		80 - 120		07/31/18 13:19	1

Method: 8260C SIM - Volatile Organic Compounds (GC/MS) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.50	0.019	ug/L			08/03/18 14:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		48 - 150		08/03/18 14:40	1
4-Bromofluorobenzene (Surr)	100		75 - 120		08/03/18 14:40	1
Dibromofluoromethane (Surr)	102		80 - 120		08/03/18 14:40	1
Toluene-d8 (Surr)	99		75 - 120		08/03/18 14:40	1
Trifluorotoluene (Surr)	102		80 - 120		08/03/18 14:40	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		3.0	0.14	ug/L			07/30/18 20:02	1
1,1-Dichloroethane	ND		2.0	0.22	ug/L			07/30/18 20:02	1
1,1-Dichloropropene	ND		3.0	0.29	ug/L			07/30/18 20:02	1
1,2,3-Trichlorobenzene	ND		5.0	0.46	ug/L			07/30/18 20:02	1
1,2,3-Trichloropropane	ND		2.0	0.41	ug/L			07/30/18 20:02	1
1,2,4-Trichlorobenzene	ND		2.0	0.33	ug/L			07/30/18 20:02	1
1,2,4-Trimethylbenzene	9.5		3.0	0.61	ug/L			07/30/18 20:02	1
1,2-Dibromo-3-Chloropropane	ND		10	1.8	ug/L			07/30/18 20:02	1
1,2-Dichlorobenzene	ND		2.0	0.46	ug/L			07/30/18 20:02	1

TestAmerica Seattle

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW2-718

Lab Sample ID: 580-79064-2

Date Collected: 07/20/18 14:10

Matrix: Water

Date Received: 07/24/18 12:50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.18	ug/L			07/30/18 20:02	1
1,3,5-Trimethylbenzene	4.1		3.0	0.55	ug/L			07/30/18 20:02	1
1,3-Dichlorobenzene	ND		2.0	0.18	ug/L			07/30/18 20:02	1
1,3-Dichloropropane	ND		2.0	0.35	ug/L			07/30/18 20:02	1
2,2-Dichloropropane	ND		3.0	0.32	ug/L			07/30/18 20:02	1
2-Chlorotoluene	ND		3.0	0.51	ug/L			07/30/18 20:02	1
4-Chlorotoluene	ND		2.0	0.51	ug/L			07/30/18 20:02	1
4-Isopropyltoluene	ND		3.0	0.28	ug/L			07/30/18 20:02	1
Bromobenzene	ND		2.0	0.18	ug/L			07/30/18 20:02	1
Bromochloromethane	ND		2.0	0.29	ug/L			07/30/18 20:02	1
Carbon tetrachloride	ND		3.0	0.30	ug/L			07/30/18 20:02	1
Chlorobenzene	ND		2.0	0.44	ug/L			07/30/18 20:02	1
Chloroethane	ND		5.0	1.1	ug/L			07/30/18 20:02	1
Chloromethane	ND		20	5.4	ug/L			07/30/18 20:02	1
Dichlorodifluoromethane	ND		10	2.3	ug/L			07/30/18 20:02	1
Ethylbenzene	20		3.0	0.50	ug/L			07/30/18 20:02	1
Isopropylbenzene	3.4		2.0	0.51	ug/L			07/30/18 20:02	1
Methyl tert-butyl ether	ND		2.0	0.44	ug/L			07/30/18 20:02	1
Methylene Chloride	ND		5.0	1.4	ug/L			07/30/18 20:02	1
m-Xylene & p-Xylene	52		3.0	0.75	ug/L			07/30/18 20:02	1
n-Butylbenzene	ND		3.0	0.44	ug/L			07/30/18 20:02	1
N-Propylbenzene	3.5		3.0	0.50	ug/L			07/30/18 20:02	1
o-Xylene	20		2.0	0.15	ug/L			07/30/18 20:02	1
sec-Butylbenzene	0.60 J		3.0	0.49	ug/L			07/30/18 20:02	1
Styrene	ND		5.0	0.51	ug/L			07/30/18 20:02	1
t-Butylbenzene	ND		3.0	0.58	ug/L			07/30/18 20:02	1
Toluene	15		2.0	0.39	ug/L			07/30/18 20:02	1
trans-1,2-Dichloroethene	ND		3.0	0.39	ug/L			07/30/18 20:02	1
Trichlorofluoromethane	ND		3.0	0.63	ug/L			07/30/18 20:02	1
cis-1,2-Dichloroethene	ND		3.0	0.69	ug/L			07/30/18 20:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		80 - 126		07/30/18 20:02	1
4-Bromofluorobenzene (Surr)	102		80 - 125		07/30/18 20:02	1
Dibromofluoromethane (Surr)	101		77 - 120		07/30/18 20:02	1
Toluene-d8 (Surr)	99		80 - 122		07/30/18 20:02	1
Trifluorotoluene (Surr)	107		80 - 120		07/30/18 20:02	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	2.7		0.091	0.053	ug/L		07/27/18 13:08	07/30/18 16:18	1
2-Methylnaphthalene	0.12		0.091	0.044	ug/L		07/27/18 13:08	07/30/18 16:18	1
1-Methylnaphthalene	0.33		0.091	0.023	ug/L		07/27/18 13:08	07/30/18 16:18	1
Acenaphthylene	ND		0.091	0.016	ug/L		07/27/18 13:08	07/30/18 16:18	1
Acenaphthene	0.032 J		0.091	0.022	ug/L		07/27/18 13:08	07/30/18 16:18	1
Fluorene	0.027 J		0.091	0.016	ug/L		07/27/18 13:08	07/30/18 16:18	1
Phenanthrene	ND		0.091	0.056	ug/L		07/27/18 13:08	07/30/18 16:18	1
Anthracene	ND		0.091	0.025	ug/L		07/27/18 13:08	07/30/18 16:18	1
Fluoranthene	ND		0.091	0.017	ug/L		07/27/18 13:08	07/30/18 16:18	1
Pyrene	ND		0.091	0.026	ug/L		07/27/18 13:08	07/30/18 16:18	1

TestAmerica Seattle

Client Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW2-718

Lab Sample ID: 580-79064-2

Date Collected: 07/20/18 14:10

Matrix: Water

Date Received: 07/24/18 12:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[a]anthracene	ND		0.091	0.012	ug/L		07/27/18 13:08	07/30/18 16:18	1
Chrysene	ND		0.091	0.0091	ug/L		07/27/18 13:08	07/30/18 16:18	1
Benzo[b]fluoranthene	ND		0.091	0.011	ug/L		07/27/18 13:08	07/30/18 16:18	1
Benzo[k]fluoranthene	ND		0.091	0.015	ug/L		07/27/18 13:08	07/30/18 16:18	1
Benzo[a]pyrene	ND		0.091	0.012	ug/L		07/27/18 13:08	07/30/18 16:18	1
Indeno[1,2,3-cd]pyrene	ND		0.091	0.022	ug/L		07/27/18 13:08	07/30/18 16:18	1
Dibenz(a,h)anthracene	ND		0.091	0.013	ug/L		07/27/18 13:08	07/30/18 16:18	1
Benzo[g,h,i]perylene	ND		0.091	0.021	ug/L		07/27/18 13:08	07/30/18 16:18	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	86		45 - 126	07/27/18 13:08	07/30/18 16:18	1
2-Fluorobiphenyl (Surr)	72		44 - 120	07/27/18 13:08	07/30/18 16:18	1
p-Terphenyl-d14	78		51 - 121	07/27/18 13:08	07/30/18 16:18	1

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	0.79	H	0.25	0.10	mg/L			08/08/18 13:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	111		68 - 119		08/08/18 13:39	1

Method: AK102 - DRO

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	0.46		0.25	0.091	mg/L		07/26/18 13:56	07/26/18 15:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	97		50 - 150	07/26/18 13:56	07/26/18 15:30	1
n-Triacontane-d62	98		50 - 150	07/26/18 13:56	07/26/18 15:30	1

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW3-718

Lab Sample ID: 580-79064-3

Date Collected: 07/20/18 15:40

Matrix: Water

Date Received: 07/24/18 12:50

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.0090	ug/L			07/31/18 13:42	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.14	ug/L			07/31/18 13:42	1
1,1,2-Trichloroethane	ND		0.50	0.017	ug/L			07/31/18 13:42	1
1,1-Dichloroethene	ND		0.50	0.037	ug/L			07/31/18 13:42	1
1,2-Dibromoethane	ND		0.50	0.014	ug/L			07/31/18 13:42	1
1,2-Dichloroethane	ND		0.50	0.037	ug/L			07/31/18 13:42	1
1,4-Dichlorobenzene	ND		0.50	0.058	ug/L			07/31/18 13:42	1
Benzene	0.16	J	0.50	0.032	ug/L			07/31/18 13:42	1
Bromodichloromethane	ND		0.50	0.040	ug/L			07/31/18 13:42	1
Bromoform	ND		0.50	0.073	ug/L			07/31/18 13:42	1
Bromomethane	ND	*	0.50	0.017	ug/L			07/31/18 13:42	1
Chloroform	ND		0.50	0.033	ug/L			07/31/18 13:42	1
cis-1,3-Dichloropropene	ND		0.50	0.038	ug/L			07/31/18 13:42	1
Dibromochloromethane	ND		0.50	0.052	ug/L			07/31/18 13:42	1
Dibromomethane	ND		0.50	0.017	ug/L			07/31/18 13:42	1
Hexachlorobutadiene	ND		0.50	0.16	ug/L			07/31/18 13:42	1
Naphthalene	33		0.50	0.18	ug/L			07/31/18 13:42	1
Tetrachloroethene	ND		0.50	0.032	ug/L			07/31/18 13:42	1
trans-1,3-Dichloropropene	ND		0.50	0.044	ug/L			07/31/18 13:42	1
Trichloroethene	ND		0.50	0.032	ug/L			07/31/18 13:42	1
Vinyl chloride	ND	*	0.50	0.019	ug/L			07/31/18 13:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		48 - 150					07/31/18 13:42	1
4-Bromofluorobenzene (Surr)	99		75 - 120					07/31/18 13:42	1
Dibromofluoromethane (Surr)	102		80 - 120					07/31/18 13:42	1
Toluene-d8 (Surr)	98		75 - 120					07/31/18 13:42	1
Trifluorotoluene (Surr)	103		80 - 120					07/31/18 13:42	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		3.0	0.14	ug/L			07/30/18 20:28	1
1,1-Dichloroethane	ND		2.0	0.22	ug/L			07/30/18 20:28	1
1,1-Dichloropropene	ND		3.0	0.29	ug/L			07/30/18 20:28	1
1,2,3-Trichlorobenzene	ND		5.0	0.46	ug/L			07/30/18 20:28	1
1,2,3-Trichloropropane	ND		2.0	0.41	ug/L			07/30/18 20:28	1
1,2,4-Trichlorobenzene	ND		2.0	0.33	ug/L			07/30/18 20:28	1
1,2,4-Trimethylbenzene	81		3.0	0.61	ug/L			07/30/18 20:28	1
1,2-Dibromo-3-Chloropropane	ND		10	1.8	ug/L			07/30/18 20:28	1
1,2-Dichlorobenzene	ND		2.0	0.46	ug/L			07/30/18 20:28	1
1,2-Dichloropropane	ND		1.0	0.18	ug/L			07/30/18 20:28	1
1,3,5-Trimethylbenzene	35		3.0	0.55	ug/L			07/30/18 20:28	1
1,3-Dichlorobenzene	ND		2.0	0.18	ug/L			07/30/18 20:28	1
1,3-Dichloropropane	ND		2.0	0.35	ug/L			07/30/18 20:28	1
2,2-Dichloropropane	ND		3.0	0.32	ug/L			07/30/18 20:28	1
2-Chlorotoluene	ND		3.0	0.51	ug/L			07/30/18 20:28	1
4-Chlorotoluene	ND		2.0	0.51	ug/L			07/30/18 20:28	1
4-Isopropyltoluene	4.6		3.0	0.28	ug/L			07/30/18 20:28	1
Bromobenzene	ND		2.0	0.18	ug/L			07/30/18 20:28	1
Bromochloromethane	ND		2.0	0.29	ug/L			07/30/18 20:28	1

TestAmerica Seattle

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW3-718

Lab Sample ID: 580-79064-3

Date Collected: 07/20/18 15:40

Matrix: Water

Date Received: 07/24/18 12:50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		3.0	0.30	ug/L			07/30/18 20:28	1
Chlorobenzene	ND		2.0	0.44	ug/L			07/30/18 20:28	1
Chloroethane	ND		5.0	1.1	ug/L			07/30/18 20:28	1
Chloromethane	ND		20	5.4	ug/L			07/30/18 20:28	1
Dichlorodifluoromethane	ND		10	2.3	ug/L			07/30/18 20:28	1
Ethylbenzene	9.5		3.0	0.50	ug/L			07/30/18 20:28	1
Isopropylbenzene	9.6		2.0	0.51	ug/L			07/30/18 20:28	1
Methyl tert-butyl ether	ND		2.0	0.44	ug/L			07/30/18 20:28	1
Methylene Chloride	ND		5.0	1.4	ug/L			07/30/18 20:28	1
m-Xylene & p-Xylene	59		3.0	0.75	ug/L			07/30/18 20:28	1
n-Butylbenzene	6.2		3.0	0.44	ug/L			07/30/18 20:28	1
N-Propylbenzene	12		3.0	0.50	ug/L			07/30/18 20:28	1
o-Xylene	27		2.0	0.15	ug/L			07/30/18 20:28	1
sec-Butylbenzene	3.4		3.0	0.49	ug/L			07/30/18 20:28	1
Styrene	ND		5.0	0.51	ug/L			07/30/18 20:28	1
t-Butylbenzene	0.64	J	3.0	0.58	ug/L			07/30/18 20:28	1
Toluene	ND		2.0	0.39	ug/L			07/30/18 20:28	1
trans-1,2-Dichloroethene	ND		3.0	0.39	ug/L			07/30/18 20:28	1
Trichlorofluoromethane	ND		3.0	0.63	ug/L			07/30/18 20:28	1
cis-1,2-Dichloroethene	ND		3.0	0.69	ug/L			07/30/18 20:28	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		80 - 126		07/30/18 20:28	1
4-Bromofluorobenzene (Surr)	104		80 - 125		07/30/18 20:28	1
Dibromofluoromethane (Surr)	102		77 - 120		07/30/18 20:28	1
Toluene-d8 (Surr)	100		80 - 122		07/30/18 20:28	1
Trifluorotoluene (Surr)	108		80 - 120		07/30/18 20:28	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	23		0.90	0.53	ug/L		07/27/18 13:08	07/30/18 16:45	10
2-Methylnaphthalene	20		0.90	0.44	ug/L		07/27/18 13:08	07/30/18 16:45	10
1-Methylnaphthalene	24		0.90	0.23	ug/L		07/27/18 13:08	07/30/18 16:45	10
Acenaphthylene	ND		0.090	0.016	ug/L		07/27/18 13:08	07/30/18 17:38	1
Acenaphthene	ND		0.090	0.022	ug/L		07/27/18 13:08	07/30/18 17:38	1
Fluorene	1.3		0.090	0.016	ug/L		07/27/18 13:08	07/30/18 17:38	1
Phenanthrene	0.38		0.090	0.056	ug/L		07/27/18 13:08	07/30/18 17:38	1
Anthracene	0.14		0.090	0.025	ug/L		07/27/18 13:08	07/30/18 17:38	1
Fluoranthene	ND		0.090	0.017	ug/L		07/27/18 13:08	07/30/18 17:38	1
Pyrene	ND		0.090	0.026	ug/L		07/27/18 13:08	07/30/18 17:38	1
Benzo[a]anthracene	ND		0.090	0.012	ug/L		07/27/18 13:08	07/30/18 17:38	1
Chrysene	ND		0.090	0.0090	ug/L		07/27/18 13:08	07/30/18 17:38	1
Benzo[b]fluoranthene	ND		0.090	0.011	ug/L		07/27/18 13:08	07/30/18 17:38	1
Benzo[k]fluoranthene	ND		0.090	0.015	ug/L		07/27/18 13:08	07/30/18 17:38	1
Benzo[a]pyrene	ND		0.090	0.012	ug/L		07/27/18 13:08	07/30/18 17:38	1
Indeno[1,2,3-cd]pyrene	ND		0.090	0.022	ug/L		07/27/18 13:08	07/30/18 17:38	1
Dibenz(a,h)anthracene	ND		0.090	0.013	ug/L		07/27/18 13:08	07/30/18 17:38	1
Benzo[g,h,i]perylene	ND		0.090	0.021	ug/L		07/27/18 13:08	07/30/18 17:38	1

TestAmerica Seattle

Client Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW3-718

Lab Sample ID: 580-79064-3

Date Collected: 07/20/18 15:40

Matrix: Water

Date Received: 07/24/18 12:50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	71		45 - 126	07/27/18 13:08	07/30/18 16:45	10
Nitrobenzene-d5	162	X	45 - 126	07/27/18 13:08	07/30/18 17:38	1
2-Fluorobiphenyl (Surr)	96		44 - 120	07/27/18 13:08	07/30/18 16:45	10
2-Fluorobiphenyl (Surr)	86		44 - 120	07/27/18 13:08	07/30/18 17:38	1
p-Terphenyl-d14	99		51 - 121	07/27/18 13:08	07/30/18 16:45	10
p-Terphenyl-d14	103		51 - 121	07/27/18 13:08	07/30/18 17:38	1

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	0.80	H	0.25	0.10	mg/L	-		08/08/18 14:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	148	X	68 - 119		08/08/18 14:10	1

Method: AK102 - DRO

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	5.1		0.25	0.091	mg/L	-	07/26/18 13:56	07/26/18 15:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	94		50 - 150	07/26/18 13:56	07/26/18 15:50	1
n-Triacontane-d62	87		50 - 150	07/26/18 13:56	07/26/18 15:50	1

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: D-718
Date Collected: 07/20/18 15:55
Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-4
Matrix: Water

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.0090	ug/L			07/31/18 14:05	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.14	ug/L			07/31/18 14:05	1
1,1,2-Trichloroethane	ND		0.50	0.017	ug/L			07/31/18 14:05	1
1,1-Dichloroethene	ND		0.50	0.037	ug/L			07/31/18 14:05	1
1,2-Dibromoethane	ND		0.50	0.014	ug/L			07/31/18 14:05	1
1,2-Dichloroethane	ND		0.50	0.037	ug/L			07/31/18 14:05	1
1,4-Dichlorobenzene	ND		0.50	0.058	ug/L			07/31/18 14:05	1
Benzene	0.19	J	0.50	0.032	ug/L			07/31/18 14:05	1
Bromodichloromethane	ND		0.50	0.040	ug/L			07/31/18 14:05	1
Bromoform	ND		0.50	0.073	ug/L			07/31/18 14:05	1
Bromomethane	ND	*	0.50	0.017	ug/L			07/31/18 14:05	1
Chloroform	ND		0.50	0.033	ug/L			07/31/18 14:05	1
cis-1,3-Dichloropropene	ND		0.50	0.038	ug/L			07/31/18 14:05	1
Dibromochloromethane	0.42	J	0.50	0.052	ug/L			07/31/18 14:05	1
Dibromomethane	ND		0.50	0.017	ug/L			07/31/18 14:05	1
Hexachlorobutadiene	ND		0.50	0.16	ug/L			07/31/18 14:05	1
Naphthalene	33		0.50	0.18	ug/L			07/31/18 14:05	1
Tetrachloroethene	ND		0.50	0.032	ug/L			07/31/18 14:05	1
trans-1,3-Dichloropropene	ND		0.50	0.044	ug/L			07/31/18 14:05	1
Trichloroethene	ND		0.50	0.032	ug/L			07/31/18 14:05	1
Vinyl chloride	ND	*	0.50	0.019	ug/L			07/31/18 14:05	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		48 - 150					07/31/18 14:05	1
4-Bromofluorobenzene (Surr)	102		75 - 120					07/31/18 14:05	1
Dibromofluoromethane (Surr)	103		80 - 120					07/31/18 14:05	1
Toluene-d8 (Surr)	97		75 - 120					07/31/18 14:05	1
Trifluorotoluene (Surr)	103		80 - 120					07/31/18 14:05	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		3.0	0.14	ug/L			07/30/18 20:54	1
1,1-Dichloroethane	ND		2.0	0.22	ug/L			07/30/18 20:54	1
1,1-Dichloropropene	ND		3.0	0.29	ug/L			07/30/18 20:54	1
1,2,3-Trichlorobenzene	ND		5.0	0.46	ug/L			07/30/18 20:54	1
1,2,3-Trichloropropane	ND		2.0	0.41	ug/L			07/30/18 20:54	1
1,2,4-Trichlorobenzene	ND		2.0	0.33	ug/L			07/30/18 20:54	1
1,2,4-Trimethylbenzene	82		3.0	0.61	ug/L			07/30/18 20:54	1
1,2-Dibromo-3-Chloropropane	ND		10	1.8	ug/L			07/30/18 20:54	1
1,2-Dichlorobenzene	ND		2.0	0.46	ug/L			07/30/18 20:54	1
1,2-Dichloropropane	ND		1.0	0.18	ug/L			07/30/18 20:54	1
1,3,5-Trimethylbenzene	36		3.0	0.55	ug/L			07/30/18 20:54	1
1,3-Dichlorobenzene	ND		2.0	0.18	ug/L			07/30/18 20:54	1
1,3-Dichloropropane	ND		2.0	0.35	ug/L			07/30/18 20:54	1
2,2-Dichloropropane	ND		3.0	0.32	ug/L			07/30/18 20:54	1
2-Chlorotoluene	ND		3.0	0.51	ug/L			07/30/18 20:54	1
4-Chlorotoluene	ND		2.0	0.51	ug/L			07/30/18 20:54	1
4-Isopropyltoluene	4.6		3.0	0.28	ug/L			07/30/18 20:54	1
Bromobenzene	ND		2.0	0.18	ug/L			07/30/18 20:54	1
Bromochloromethane	ND		2.0	0.29	ug/L			07/30/18 20:54	1

TestAmerica Seattle

Client Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: D-718

Lab Sample ID: 580-79064-4

Date Collected: 07/20/18 15:55

Matrix: Water

Date Received: 07/24/18 12:50

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		3.0	0.30	ug/L			07/30/18 20:54	1
Chlorobenzene	ND		2.0	0.44	ug/L			07/30/18 20:54	1
Chloroethane	ND		5.0	1.1	ug/L			07/30/18 20:54	1
Chloromethane	ND		20	5.4	ug/L			07/30/18 20:54	1
Dichlorodifluoromethane	ND		10	2.3	ug/L			07/30/18 20:54	1
Ethylbenzene	9.6		3.0	0.50	ug/L			07/30/18 20:54	1
Isopropylbenzene	9.4		2.0	0.51	ug/L			07/30/18 20:54	1
Methyl tert-butyl ether	ND		2.0	0.44	ug/L			07/30/18 20:54	1
Methylene Chloride	ND		5.0	1.4	ug/L			07/30/18 20:54	1
m-Xylene & p-Xylene	60		3.0	0.75	ug/L			07/30/18 20:54	1
n-Butylbenzene	6.0		3.0	0.44	ug/L			07/30/18 20:54	1
N-Propylbenzene	12		3.0	0.50	ug/L			07/30/18 20:54	1
o-Xylene	28		2.0	0.15	ug/L			07/30/18 20:54	1
sec-Butylbenzene	3.2		3.0	0.49	ug/L			07/30/18 20:54	1
Styrene	ND		5.0	0.51	ug/L			07/30/18 20:54	1
t-Butylbenzene	0.65 J		3.0	0.58	ug/L			07/30/18 20:54	1
Toluene	ND		2.0	0.39	ug/L			07/30/18 20:54	1
trans-1,2-Dichloroethene	ND		3.0	0.39	ug/L			07/30/18 20:54	1
Trichlorofluoromethane	ND		3.0	0.63	ug/L			07/30/18 20:54	1
cis-1,2-Dichloroethene	ND		3.0	0.69	ug/L			07/30/18 20:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		80 - 126		07/30/18 20:54	1
4-Bromofluorobenzene (Surr)	101		80 - 125		07/30/18 20:54	1
Dibromofluoromethane (Surr)	99		77 - 120		07/30/18 20:54	1
Toluene-d8 (Surr)	101		80 - 122		07/30/18 20:54	1
Trifluorotoluene (Surr)	108		80 - 120		07/30/18 20:54	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	24		0.91	0.53	ug/L		07/27/18 13:08	07/30/18 17:11	10
2-Methylnaphthalene	32		0.91	0.44	ug/L		07/27/18 13:08	07/30/18 17:11	10
1-Methylnaphthalene	32		0.91	0.23	ug/L		07/27/18 13:08	07/30/18 17:11	10
Acenaphthylene	0.19		0.091	0.016	ug/L		07/27/18 13:08	07/30/18 18:05	1
Acenaphthene	0.40		0.091	0.022	ug/L		07/27/18 13:08	07/30/18 18:05	1
Fluorene	1.6		0.091	0.016	ug/L		07/27/18 13:08	07/30/18 18:05	1
Phenanthrene	1.5		0.091	0.056	ug/L		07/27/18 13:08	07/30/18 18:05	1
Anthracene	0.34		0.091	0.025	ug/L		07/27/18 13:08	07/30/18 18:05	1
Fluoranthene	ND		0.091	0.017	ug/L		07/27/18 13:08	07/30/18 18:05	1
Pyrene	ND		0.091	0.026	ug/L		07/27/18 13:08	07/30/18 18:05	1
Benzo[a]anthracene	ND		0.091	0.012	ug/L		07/27/18 13:08	07/30/18 18:05	1
Chrysene	ND		0.091	0.0091	ug/L		07/27/18 13:08	07/30/18 18:05	1
Benzo[b]fluoranthene	ND		0.091	0.011	ug/L		07/27/18 13:08	07/30/18 18:05	1
Benzo[k]fluoranthene	ND		0.091	0.015	ug/L		07/27/18 13:08	07/30/18 18:05	1
Benzo[a]pyrene	ND		0.091	0.012	ug/L		07/27/18 13:08	07/30/18 18:05	1
Indeno[1,2,3-cd]pyrene	ND		0.091	0.022	ug/L		07/27/18 13:08	07/30/18 18:05	1
Dibenz(a,h)anthracene	ND		0.091	0.013	ug/L		07/27/18 13:08	07/30/18 18:05	1
Benzo[g,h,i]perylene	ND		0.091	0.021	ug/L		07/27/18 13:08	07/30/18 18:05	1

TestAmerica Seattle

Client Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: D-718
Date Collected: 07/20/18 15:55
Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-4
Matrix: Water

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Nitrobenzene-d5	0	X	45 - 126	07/27/18 13:08	07/30/18 17:11	10
Nitrobenzene-d5	84		45 - 126	07/27/18 13:08	07/30/18 18:05	1
2-Fluorobiphenyl (Surr)	86		44 - 120	07/27/18 13:08	07/30/18 17:11	10
2-Fluorobiphenyl (Surr)	73		44 - 120	07/27/18 13:08	07/30/18 18:05	1
p-Terphenyl-d14	81		51 - 121	07/27/18 13:08	07/30/18 17:11	10
p-Terphenyl-d14	86		51 - 121	07/27/18 13:08	07/30/18 18:05	1

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	0.83	H	0.25	0.10	mg/L	-		08/08/18 14:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	145	X	68 - 119		08/08/18 14:41	1

Method: AK102 - DRO

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	14		0.25	0.091	mg/L	-	07/26/18 13:56	07/26/18 16:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	92		50 - 150	07/26/18 13:56	07/26/18 16:06	1
n-Triacontane-d62	87		50 - 150	07/26/18 13:56	07/26/18 16:06	1

Client Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: Trip Blank

Lab Sample ID: 580-79064-5

Date Collected: 07/20/18 07:00

Matrix: Water

Date Received: 07/24/18 12:50

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0	0.53	ug/L			07/30/18 13:56	1
Toluene	ND		2.0	0.39	ug/L			07/30/18 13:56	1
Ethylbenzene	ND		3.0	0.50	ug/L			07/30/18 13:56	1
m-Xylene & p-Xylene	ND		3.0	0.75	ug/L			07/30/18 13:56	1
o-Xylene	ND		2.0	0.15	ug/L			07/30/18 13:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	101		80 - 122		07/30/18 13:56	1
Trifluorotoluene (Surr)	106		80 - 120		07/30/18 13:56	1
4-Bromofluorobenzene (Surr)	102		80 - 125		07/30/18 13:56	1
Dibromofluoromethane (Surr)	100		77 - 120		07/30/18 13:56	1
1,2-Dichloroethane-d4 (Surr)	90		80 - 126		07/30/18 13:56	1

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.25	0.10	mg/L			07/28/18 18:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	99		68 - 119		07/28/18 18:35	1

QC Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-280129/5

Matrix: Water

Analysis Batch: 280129

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.0	0.53	ug/L			07/26/18 16:16	1
Ethylbenzene	ND		3.0	0.50	ug/L			07/26/18 16:16	1
m-Xylene & p-Xylene	ND		3.0	0.75	ug/L			07/26/18 16:16	1
o-Xylene	ND		2.0	0.15	ug/L			07/26/18 16:16	1
Toluene	ND		2.0	0.39	ug/L			07/26/18 16:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		80 - 126		07/26/18 16:16	1
4-Bromofluorobenzene (Surr)	99		80 - 125		07/26/18 16:16	1
Dibromofluoromethane (Surr)	104		77 - 120		07/26/18 16:16	1
Toluene-d8 (Surr)	103		80 - 122		07/26/18 16:16	1
Trifluorotoluene (Surr)	105		80 - 120		07/26/18 16:16	1

Lab Sample ID: LCS 580-280129/6

Matrix: Water

Analysis Batch: 280129

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	9.30		ug/L		93	75 - 128
Ethylbenzene	10.0	9.95		ug/L		100	75 - 120
m-Xylene & p-Xylene	10.0	9.96		ug/L		100	75 - 120
o-Xylene	10.0	10.1		ug/L		101	74 - 120
Toluene	10.0	9.98		ug/L		100	75 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	101		80 - 126
4-Bromofluorobenzene (Surr)	101		80 - 125
Dibromofluoromethane (Surr)	103		77 - 120
Toluene-d8 (Surr)	98		80 - 122
Trifluorotoluene (Surr)	106		80 - 120

Lab Sample ID: LCSD 580-280129/7

Matrix: Water

Analysis Batch: 280129

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	9.84		ug/L		98	75 - 128	6	14
Ethylbenzene	10.0	10.1		ug/L		101	75 - 120	1	14
m-Xylene & p-Xylene	10.0	10.4		ug/L		104	75 - 120	4	14
o-Xylene	10.0	10.5		ug/L		105	74 - 120	4	16
Toluene	10.0	10.3		ug/L		103	75 - 120	3	13

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		80 - 126
4-Bromofluorobenzene (Surr)	101		80 - 125
Dibromofluoromethane (Surr)	103		77 - 120
Toluene-d8 (Surr)	101		80 - 122

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-280129/7
Matrix: Water
Analysis Batch: 280129

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

Surrogate	LCS D %Recovery	LCS D Qualifier	Limits
Trifluorotoluene (Surr)	104		80 - 120

Lab Sample ID: MB 580-280369/5
Matrix: Water
Analysis Batch: 280369

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		3.0	0.14	ug/L			07/30/18 12:37	1
1,1-Dichloroethane	ND		2.0	0.22	ug/L			07/30/18 12:37	1
Benzene	ND		3.0	0.53	ug/L			07/30/18 12:37	1
1,1-Dichloropropene	ND		3.0	0.29	ug/L			07/30/18 12:37	1
1,2,3-Trichlorobenzene	ND		5.0	0.46	ug/L			07/30/18 12:37	1
1,2,3-Trichloropropane	ND		2.0	0.41	ug/L			07/30/18 12:37	1
1,2,4-Trichlorobenzene	ND		2.0	0.33	ug/L			07/30/18 12:37	1
1,2,4-Trimethylbenzene	ND		3.0	0.61	ug/L			07/30/18 12:37	1
1,2-Dibromo-3-Chloropropane	ND		10	1.8	ug/L			07/30/18 12:37	1
1,2-Dichlorobenzene	ND		2.0	0.46	ug/L			07/30/18 12:37	1
1,2-Dichloropropane	ND		1.0	0.18	ug/L			07/30/18 12:37	1
1,3,5-Trimethylbenzene	ND		3.0	0.55	ug/L			07/30/18 12:37	1
1,3-Dichlorobenzene	ND		2.0	0.18	ug/L			07/30/18 12:37	1
1,3-Dichloropropane	ND		2.0	0.35	ug/L			07/30/18 12:37	1
2,2-Dichloropropane	ND		3.0	0.32	ug/L			07/30/18 12:37	1
2-Chlorotoluene	ND		3.0	0.51	ug/L			07/30/18 12:37	1
4-Chlorotoluene	ND		2.0	0.51	ug/L			07/30/18 12:37	1
4-Isopropyltoluene	ND		3.0	0.28	ug/L			07/30/18 12:37	1
Bromobenzene	ND		2.0	0.18	ug/L			07/30/18 12:37	1
Bromochloromethane	ND		2.0	0.29	ug/L			07/30/18 12:37	1
Carbon tetrachloride	ND		3.0	0.30	ug/L			07/30/18 12:37	1
Chlorobenzene	ND		2.0	0.44	ug/L			07/30/18 12:37	1
Chloroethane	ND		5.0	1.1	ug/L			07/30/18 12:37	1
Chloromethane	ND		20	5.4	ug/L			07/30/18 12:37	1
Dichlorodifluoromethane	ND		10	2.3	ug/L			07/30/18 12:37	1
Ethylbenzene	ND		3.0	0.50	ug/L			07/30/18 12:37	1
Isopropylbenzene	ND		2.0	0.51	ug/L			07/30/18 12:37	1
Methyl tert-butyl ether	ND		2.0	0.44	ug/L			07/30/18 12:37	1
Methylene Chloride	ND		5.0	1.4	ug/L			07/30/18 12:37	1
m-Xylene & p-Xylene	ND		3.0	0.75	ug/L			07/30/18 12:37	1
n-Butylbenzene	ND		3.0	0.44	ug/L			07/30/18 12:37	1
N-Propylbenzene	ND		3.0	0.50	ug/L			07/30/18 12:37	1
o-Xylene	ND		2.0	0.15	ug/L			07/30/18 12:37	1
sec-Butylbenzene	ND		3.0	0.49	ug/L			07/30/18 12:37	1
Styrene	ND		5.0	0.51	ug/L			07/30/18 12:37	1
t-Butylbenzene	ND		3.0	0.58	ug/L			07/30/18 12:37	1
Toluene	ND		2.0	0.39	ug/L			07/30/18 12:37	1
trans-1,2-Dichloroethene	ND		3.0	0.39	ug/L			07/30/18 12:37	1
Trichlorofluoromethane	ND		3.0	0.63	ug/L			07/30/18 12:37	1
cis-1,2-Dichloroethene	ND		3.0	0.69	ug/L			07/30/18 12:37	1

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 580-280369/5
Matrix: Water
Analysis Batch: 280369

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

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		80 - 126		07/30/18 12:37	1
4-Bromofluorobenzene (Surr)	100		80 - 125		07/30/18 12:37	1
Dibromofluoromethane (Surr)	101		77 - 120		07/30/18 12:37	1
Toluene-d8 (Surr)	99		80 - 122		07/30/18 12:37	1
Trifluorotoluene (Surr)	106		80 - 120		07/30/18 12:37	1

Lab Sample ID: LCS 580-280369/6
Matrix: Water
Analysis Batch: 280369

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,1-Trichloroethane	10.0	10.2		ug/L		102	74 - 130
1,1-Dichloroethane	10.0	9.91		ug/L		99	70 - 129
Benzene	10.0	9.63		ug/L		96	75 - 128
1,1-Dichloropropene	10.0	9.60		ug/L		96	75 - 125
1,2,3-Trichlorobenzene	10.0	8.87		ug/L		89	51 - 142
1,2,3-Trichloropropane	10.0	7.59		ug/L		76	76 - 124
1,2,4-Trichlorobenzene	10.0	10.1		ug/L		101	63 - 129
1,2,4-Trimethylbenzene	10.0	9.74		ug/L		97	75 - 121
1,2-Dibromo-3-Chloropropane	10.0	7.52	J	ug/L		75	65 - 133
1,2-Dichlorobenzene	10.0	9.58		ug/L		96	80 - 120
1,2-Dichloropropane	10.0	9.65		ug/L		96	72 - 126
1,3,5-Trimethylbenzene	10.0	9.69		ug/L		97	75 - 122
1,3-Dichlorobenzene	10.0	11.1		ug/L		111	80 - 120
1,3-Dichloropropane	10.0	8.84		ug/L		88	79 - 120
2,2-Dichloropropane	10.0	10.8		ug/L		108	62 - 140
2-Chlorotoluene	10.0	9.96		ug/L		100	80 - 120
4-Chlorotoluene	10.0	9.73		ug/L		97	80 - 120
4-Isopropyltoluene	10.0	9.82		ug/L		98	77 - 120
Bromobenzene	10.0	9.77		ug/L		98	75 - 120
Bromochloromethane	10.0	9.69		ug/L		97	78 - 128
Carbon tetrachloride	10.0	10.2		ug/L		102	72 - 139
Chlorobenzene	10.0	10.5		ug/L		105	80 - 120
Chloroethane	10.0	9.23		ug/L		92	65 - 132
Chloromethane	10.0	7.47	J	ug/L		75	52 - 149
Dichlorodifluoromethane	10.0	4.03	J	ug/L		40	28 - 150
Ethylbenzene	10.0	10.3		ug/L		103	75 - 120
Isopropylbenzene	10.0	10.6		ug/L		106	75 - 120
Methyl tert-butyl ether	10.0	8.90		ug/L		89	72 - 130
Methylene Chloride	10.0	10.5		ug/L		105	70 - 125
m-Xylene & p-Xylene	10.0	10.4		ug/L		104	75 - 120
n-Butylbenzene	10.0	9.60		ug/L		96	78 - 120
N-Propylbenzene	10.0	9.74		ug/L		97	73 - 124
o-Xylene	10.0	10.5		ug/L		105	74 - 120
sec-Butylbenzene	10.0	9.58		ug/L		96	78 - 125
Styrene	10.0	9.95		ug/L		100	76 - 121
t-Butylbenzene	10.0	9.68		ug/L		97	80 - 121
Toluene	10.0	10.4		ug/L		104	75 - 120

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-280369/6

Matrix: Water

Analysis Batch: 280369

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
trans-1,2-Dichloroethene	10.0	10.7		ug/L		107	72 - 124
Trichlorofluoromethane	10.0	9.12		ug/L		91	64 - 136
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	76 - 129

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	92		80 - 126
4-Bromofluorobenzene (Surr)	104		80 - 125
Dibromofluoromethane (Surr)	101		77 - 120
Toluene-d8 (Surr)	101		80 - 122
Trifluorotoluene (Surr)	107		80 - 120

Lab Sample ID: LCSD 580-280369/7

Matrix: Water

Analysis Batch: 280369

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1,1-Trichloroethane	10.0	10.3		ug/L		103	74 - 130	1	18
1,1-Dichloroethane	10.0	9.75		ug/L		97	70 - 129	2	20
Benzene	10.0	9.53		ug/L		95	75 - 128	1	14
1,1-Dichloropropene	10.0	9.72		ug/L		97	75 - 125	1	20
1,2,3-Trichlorobenzene	10.0	8.70		ug/L		87	51 - 142	2	17
1,2,3-Trichloropropane	10.0	7.76		ug/L		78	76 - 124	2	30
1,2,4-Trichlorobenzene	10.0	9.62		ug/L		96	63 - 129	5	22
1,2,4-Trimethylbenzene	10.0	9.90		ug/L		99	75 - 121	2	16
1,2-Dibromo-3-Chloropropane	10.0	6.84	J	ug/L		68	65 - 133	9	35
1,2-Dichlorobenzene	10.0	9.59		ug/L		96	80 - 120	0	15
1,2-Dichloropropane	10.0	9.50		ug/L		95	72 - 126	2	26
1,3,5-Trimethylbenzene	10.0	9.84		ug/L		98	75 - 122	2	14
1,3-Dichlorobenzene	10.0	11.3		ug/L		113	80 - 120	2	14
1,3-Dichloropropane	10.0	8.70		ug/L		87	79 - 120	2	35
2,2-Dichloropropane	10.0	11.0		ug/L		110	62 - 140	2	35
2-Chlorotoluene	10.0	10.3		ug/L		103	80 - 120	3	15
4-Chlorotoluene	10.0	9.96		ug/L		100	80 - 120	2	34
4-Isopropyltoluene	10.0	9.93		ug/L		99	77 - 120	1	13
Bromobenzene	10.0	9.96		ug/L		100	75 - 120	2	13
Bromochloromethane	10.0	9.73		ug/L		97	78 - 128	0	35
Carbon tetrachloride	10.0	10.2		ug/L		102	72 - 139	0	19
Chlorobenzene	10.0	10.5		ug/L		105	80 - 120	0	15
Chloroethane	10.0	9.18		ug/L		92	65 - 132	1	35
Chloromethane	10.0	7.67	J	ug/L		77	52 - 149	3	35
Dichlorodifluoromethane	10.0	3.78	J	ug/L		38	28 - 150	7	35
Ethylbenzene	10.0	10.3		ug/L		103	75 - 120	0	14
Isopropylbenzene	10.0	10.4		ug/L		104	75 - 120	1	20
Methyl tert-butyl ether	10.0	8.67		ug/L		87	72 - 130	3	18
Methylene Chloride	10.0	10.4		ug/L		104	70 - 125	0	29
m-Xylene & p-Xylene	10.0	10.4		ug/L		104	75 - 120	0	14
n-Butylbenzene	10.0	9.98		ug/L		100	78 - 120	4	14
N-Propylbenzene	10.0	10.2		ug/L		102	73 - 124	5	13

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-280369/7
Matrix: Water
Analysis Batch: 280369

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
o-Xylene	10.0	10.2		ug/L		102	74 - 120	2	16
sec-Butylbenzene	10.0	9.81		ug/L		98	78 - 125	2	15
Styrene	10.0	9.94		ug/L		99	76 - 121	0	16
t-Butylbenzene	10.0	9.88		ug/L		99	80 - 121	2	14
Toluene	10.0	10.3		ug/L		103	75 - 120	1	13
trans-1,2-Dichloroethene	10.0	10.7		ug/L		107	72 - 124	0	21
Trichlorofluoromethane	10.0	8.74		ug/L		87	64 - 136	4	35
cis-1,2-Dichloroethene	10.0	9.58		ug/L		96	76 - 129	4	15

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
1,2-Dichloroethane-d4 (Surr)	89		80 - 126
4-Bromofluorobenzene (Surr)	101		80 - 125
Dibromofluoromethane (Surr)	100		77 - 120
Toluene-d8 (Surr)	99		80 - 122
Trifluorotoluene (Surr)	107		80 - 120

Method: 8260C SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-280485/5
Matrix: Water
Analysis Batch: 280485

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1,2-Tetrachloroethane	ND		0.50	0.0090	ug/L			07/31/18 12:10	1
1,1,2,2-Tetrachloroethane	ND		0.50	0.14	ug/L			07/31/18 12:10	1
1,1,2-Trichloroethane	ND		0.50	0.017	ug/L			07/31/18 12:10	1
1,1-Dichloroethene	ND		0.50	0.037	ug/L			07/31/18 12:10	1
1,2-Dibromoethane	ND		0.50	0.014	ug/L			07/31/18 12:10	1
1,2-Dichloroethane	ND		0.50	0.037	ug/L			07/31/18 12:10	1
1,4-Dichlorobenzene	ND		0.50	0.058	ug/L			07/31/18 12:10	1
Benzene	ND		0.50	0.032	ug/L			07/31/18 12:10	1
Bromodichloromethane	ND		0.50	0.040	ug/L			07/31/18 12:10	1
Bromoform	ND		0.50	0.073	ug/L			07/31/18 12:10	1
Bromomethane	ND		0.50	0.017	ug/L			07/31/18 12:10	1
Chloroform	ND		0.50	0.033	ug/L			07/31/18 12:10	1
cis-1,3-Dichloropropene	ND		0.50	0.038	ug/L			07/31/18 12:10	1
Dibromochloromethane	ND		0.50	0.052	ug/L			07/31/18 12:10	1
Dibromomethane	ND		0.50	0.017	ug/L			07/31/18 12:10	1
Hexachlorobutadiene	ND		0.50	0.16	ug/L			07/31/18 12:10	1
Naphthalene	ND		0.50	0.18	ug/L			07/31/18 12:10	1
Tetrachloroethene	ND		0.50	0.032	ug/L			07/31/18 12:10	1
trans-1,3-Dichloropropene	ND		0.50	0.044	ug/L			07/31/18 12:10	1
Trichloroethene	ND		0.50	0.032	ug/L			07/31/18 12:10	1
Vinyl chloride	ND		0.50	0.019	ug/L			07/31/18 12:10	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		48 - 150		07/31/18 12:10	1

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-280485/5
Matrix: Water
Analysis Batch: 280485

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

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
4-Bromofluorobenzene (Surr)	100		75 - 120		07/31/18 12:10	1
Dibromofluoromethane (Surr)	106		80 - 120		07/31/18 12:10	1
Toluene-d8 (Surr)	99		75 - 120		07/31/18 12:10	1
Trifluorotoluene (Surr)	101		80 - 120		07/31/18 12:10	1

Lab Sample ID: LCS 580-280485/6
Matrix: Water
Analysis Batch: 280485

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1,2,2-Tetrachloroethane	5.00	5.02		ug/L		100	65 - 144
1,1,2-Trichloroethane	5.00	4.87		ug/L		97	69 - 135
1,1-Dichloroethene	5.00	5.30		ug/L		106	64 - 139
1,2-Dibromoethane	5.00	4.93		ug/L		99	75 - 120
1,2-Dichloroethane	5.00	5.37		ug/L		107	58 - 155
1,4-Dichlorobenzene	5.00	5.14		ug/L		103	75 - 130
Benzene	5.00	5.22		ug/L		104	71 - 137
Bromodichloromethane	5.00	5.50		ug/L		110	61 - 150
Bromoform	5.00	4.95		ug/L		99	55 - 130
Bromomethane	5.00	5.07		ug/L		101	69 - 137
Chloroform	5.00	5.40		ug/L		108	65 - 150
cis-1,3-Dichloropropene	5.00	4.86		ug/L		97	61 - 140
Dibromochloromethane	5.00	4.97		ug/L		99	71 - 120
Dibromomethane	5.00	5.42		ug/L		108	67 - 126
Hexachlorobutadiene	5.00	6.11		ug/L		122	73 - 139
Naphthalene	5.00	4.88		ug/L		98	69 - 134
Tetrachloroethene	5.00	5.13		ug/L		103	63 - 134
trans-1,3-Dichloropropene	5.00	4.76		ug/L		95	62 - 133
Trichloroethene	5.00	5.62		ug/L		112	70 - 140
Vinyl chloride	5.00	7.80	*	ug/L		156	56 - 150

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	97		48 - 150
4-Bromofluorobenzene (Surr)	94		75 - 120
Dibromofluoromethane (Surr)	100		80 - 120
Toluene-d8 (Surr)	92		75 - 120
Trifluorotoluene (Surr)	102		80 - 120

Lab Sample ID: LCSD 580-280485/7
Matrix: Water
Analysis Batch: 280485

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
1,1,1,2-Tetrachloroethane	5.00	5.11		ug/L		102	64 - 124	3	10
1,1,2,2-Tetrachloroethane	5.00	4.98		ug/L		100	65 - 144	1	18
1,1,2-Trichloroethane	5.00	4.92		ug/L		98	69 - 135	1	15
1,1-Dichloroethene	5.00	5.49		ug/L		110	64 - 139	4	11

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-280485/7
Matrix: Water
Analysis Batch: 280485

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane	5.00	4.89		ug/L		98	75 - 120	1	17
1,2-Dichloroethane	5.00	5.47		ug/L		109	58 - 155	2	11
1,4-Dichlorobenzene	5.00	5.29		ug/L		106	75 - 130	3	35
Benzene	5.00	5.44		ug/L		109	71 - 137	4	10
Bromodichloromethane	5.00	5.65		ug/L		113	61 - 150	3	10
Bromoform	5.00	4.96		ug/L		99	55 - 130	0	14
Bromomethane	5.00	7.12	*	ug/L		142	69 - 137	34	16
Chloroform	5.00	5.63		ug/L		113	65 - 150	4	10
cis-1,3-Dichloropropene	5.00	4.96		ug/L		99	61 - 140	2	30
Dibromochloromethane	5.00	4.99		ug/L		100	71 - 120	0	21
Dibromomethane	5.00	5.45		ug/L		109	67 - 126	1	15
Hexachlorobutadiene	5.00	6.35		ug/L		127	73 - 139	4	19
Naphthalene	5.00	4.91		ug/L		98	69 - 134	1	13
Tetrachloroethene	5.00	5.30		ug/L		106	63 - 134	3	20
trans-1,3-Dichloropropene	5.00	4.82		ug/L		96	62 - 133	1	30
Trichloroethene	5.00	5.82		ug/L		116	70 - 140	3	10
Vinyl chloride	5.00	8.25	*	ug/L		165	56 - 150	6	16

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
1,2-Dichloroethane-d4 (Surr)	98		48 - 150
4-Bromofluorobenzene (Surr)	94		75 - 120
Dibromofluoromethane (Surr)	101		80 - 120
Toluene-d8 (Surr)	92		75 - 120
Trifluorotoluene (Surr)	102		80 - 120

Lab Sample ID: MB 580-280749/5
Matrix: Water
Analysis Batch: 280749

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Vinyl chloride	ND		0.50	0.019	ug/L			08/03/18 11:12	1

Surrogate	MB %Recovery	MB Qualifier	MB Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		48 - 150		08/03/18 11:12	1
4-Bromofluorobenzene (Surr)	99		75 - 120		08/03/18 11:12	1
Dibromofluoromethane (Surr)	97		80 - 120		08/03/18 11:12	1
Toluene-d8 (Surr)	99		75 - 120		08/03/18 11:12	1
Trifluorotoluene (Surr)	102		80 - 120		08/03/18 11:12	1

Lab Sample ID: LCS 580-280749/6
Matrix: Water
Analysis Batch: 280749

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	5.00	5.67		ug/L		113	56 - 150

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: 8260C SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-280749/6
Matrix: Water
Analysis Batch: 280749

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

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	91		48 - 150
4-Bromofluorobenzene (Surr)	95		75 - 120
Dibromofluoromethane (Surr)	98		80 - 120
Toluene-d8 (Surr)	93		75 - 120
Trifluorotoluene (Surr)	103		80 - 120

Lab Sample ID: LCSD 580-280749/7
Matrix: Water
Analysis Batch: 280749

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride	5.00	5.62		ug/L		112	56 - 150	1	16

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		48 - 150
4-Bromofluorobenzene (Surr)	94		75 - 120
Dibromofluoromethane (Surr)	95		80 - 120
Toluene-d8 (Surr)	93		75 - 120
Trifluorotoluene (Surr)	103		80 - 120

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

Lab Sample ID: MB 590-17974/1-A
Matrix: Water
Analysis Batch: 17985

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17974

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.090	0.053	ug/L		07/27/18 13:08	07/30/18 14:58	1
2-Methylnaphthalene	ND		0.090	0.044	ug/L		07/27/18 13:08	07/30/18 14:58	1
1-Methylnaphthalene	ND		0.090	0.023	ug/L		07/27/18 13:08	07/30/18 14:58	1
Acenaphthylene	ND		0.090	0.016	ug/L		07/27/18 13:08	07/30/18 14:58	1
Acenaphthene	ND		0.090	0.022	ug/L		07/27/18 13:08	07/30/18 14:58	1
Fluorene	ND		0.090	0.016	ug/L		07/27/18 13:08	07/30/18 14:58	1
Phenanthrene	ND		0.090	0.056	ug/L		07/27/18 13:08	07/30/18 14:58	1
Anthracene	ND		0.090	0.025	ug/L		07/27/18 13:08	07/30/18 14:58	1
Fluoranthene	ND		0.090	0.017	ug/L		07/27/18 13:08	07/30/18 14:58	1
Pyrene	ND		0.090	0.026	ug/L		07/27/18 13:08	07/30/18 14:58	1
Benzo[a]anthracene	ND		0.090	0.012	ug/L		07/27/18 13:08	07/30/18 14:58	1
Chrysene	ND		0.090	0.0090	ug/L		07/27/18 13:08	07/30/18 14:58	1
Benzo[b]fluoranthene	ND		0.090	0.011	ug/L		07/27/18 13:08	07/30/18 14:58	1
Benzo[k]fluoranthene	ND		0.090	0.015	ug/L		07/27/18 13:08	07/30/18 14:58	1
Benzo[a]pyrene	ND		0.090	0.012	ug/L		07/27/18 13:08	07/30/18 14:58	1
Indeno[1,2,3-cd]pyrene	ND		0.090	0.022	ug/L		07/27/18 13:08	07/30/18 14:58	1
Dibenz(a,h)anthracene	ND		0.090	0.013	ug/L		07/27/18 13:08	07/30/18 14:58	1
Benzo[g,h,i]perylene	ND		0.090	0.021	ug/L		07/27/18 13:08	07/30/18 14:58	1

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

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

Lab Sample ID: MB 590-17974/1-A
Matrix: Water
Analysis Batch: 17985

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17974

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Nitrobenzene-d5	77		45 - 126	07/27/18 13:08	07/30/18 14:58	1
2-Fluorobiphenyl (Surr)	73		44 - 120	07/27/18 13:08	07/30/18 14:58	1
p-Terphenyl-d14	84		51 - 121	07/27/18 13:08	07/30/18 14:58	1

Lab Sample ID: LCS 590-17974/2-A
Matrix: Water
Analysis Batch: 17985

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17974

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	
							Lower	Upper
Naphthalene	1.60	1.18		ug/L		74	52 - 121	
2-Methylnaphthalene	1.60	1.14		ug/L		71	44 - 134	
1-Methylnaphthalene	1.60	1.28		ug/L		80	56 - 123	
Acenaphthylene	1.60	1.11		ug/L		70	57 - 134	
Acenaphthene	1.60	1.18		ug/L		74	54 - 132	
Fluorene	1.60	1.22		ug/L		76	59 - 141	
Phenanthrene	1.60	1.30		ug/L		81	57 - 141	
Anthracene	1.60	1.47		ug/L		92	60 - 136	
Fluoranthene	1.60	1.30		ug/L		81	76 - 133	
Pyrene	1.60	1.35		ug/L		85	59 - 145	
Benzo[a]anthracene	1.60	1.34		ug/L		84	76 - 138	
Chrysene	1.60	1.35		ug/L		85	69 - 138	
Benzo[b]fluoranthene	1.60	1.42		ug/L		89	69 - 144	
Benzo[k]fluoranthene	1.60	1.29		ug/L		81	67 - 141	
Benzo[a]pyrene	1.60	1.32		ug/L		82	70 - 141	
Indeno[1,2,3-cd]pyrene	1.60	1.31		ug/L		82	73 - 146	
Dibenz(a,h)anthracene	1.60	1.31		ug/L		82	68 - 144	
Benzo[g,h,i]perylene	1.60	1.34		ug/L		84	68 - 150	

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
Nitrobenzene-d5	89		45 - 126
2-Fluorobiphenyl (Surr)	82		44 - 120
p-Terphenyl-d14	94		51 - 121

Lab Sample ID: LCSD 590-17974/3-A
Matrix: Water
Analysis Batch: 17985

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17974

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits		RPD	
							Lower	Upper	RPD	Limit
Naphthalene	1.60	1.16		ug/L		73	52 - 121	2	30	
2-Methylnaphthalene	1.60	1.13		ug/L		71	44 - 134	1	30	
1-Methylnaphthalene	1.60	1.26		ug/L		79	56 - 123	2	30	
Acenaphthylene	1.60	1.16		ug/L		73	57 - 134	4	30	
Acenaphthene	1.60	1.21		ug/L		75	54 - 132	2	30	
Fluorene	1.60	1.26		ug/L		79	59 - 141	3	30	
Phenanthrene	1.60	1.35		ug/L		84	57 - 141	4	30	
Anthracene	1.60	1.54		ug/L		96	60 - 136	5	30	
Fluoranthene	1.60	1.40		ug/L		88	76 - 133	7	30	
Pyrene	1.60	1.40		ug/L		88	59 - 145	4	30	

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

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

Lab Sample ID: LCSD 590-17974/3-A
Matrix: Water
Analysis Batch: 17985

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17974

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[a]anthracene	1.60	1.43		ug/L		89	76 - 138	6	30
Chrysene	1.60	1.39		ug/L		87	69 - 138	3	30
Benzo[b]fluoranthene	1.60	1.47		ug/L		92	69 - 144	3	30
Benzo[k]fluoranthene	1.60	1.37		ug/L		86	67 - 141	6	30
Benzo[a]pyrene	1.60	1.39		ug/L		87	70 - 141	5	30
Indeno[1,2,3-cd]pyrene	1.60	1.38		ug/L		86	73 - 146	5	30
Dibenz(a,h)anthracene	1.60	1.37		ug/L		86	68 - 144	5	30
Benzo[g,h,i]perylene	1.60	1.40		ug/L		87	68 - 150	4	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Nitrobenzene-d5	91		45 - 126
2-Fluorobiphenyl (Surr)	76		44 - 120
p-Terphenyl-d14	97		51 - 121

Method: AK101 - Alaska - Gasoline Range Organics (GC)

Lab Sample ID: MB 580-280292/6
Matrix: Water
Analysis Batch: 280292

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.25	0.10	mg/L			07/28/18 16:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	106		68 - 119		07/28/18 16:01	1

Lab Sample ID: LCS 580-280292/7
Matrix: Water
Analysis Batch: 280292

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics (GRO) -C6-C10	1.00	1.03		mg/L		103	77 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	113		68 - 119

Lab Sample ID: LCSD 580-280292/8
Matrix: Water
Analysis Batch: 280292

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10	1.00	1.02		mg/L		102	77 - 123	0	20

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: AK101 - Alaska - Gasoline Range Organics (GC) (Continued)

Lab Sample ID: LCSD 580-280292/8
Matrix: Water
Analysis Batch: 280292

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

Surrogate	LCS D %Recovery	LCS D Qualifier	Limits
4-Bromofluorobenzene (Surr)	112		68 - 119

Lab Sample ID: MB 580-281089/6
Matrix: Water
Analysis Batch: 281089

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		0.25	0.10	mg/L			08/08/18 12:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		68 - 119		08/08/18 12:05	1

Lab Sample ID: LCS 580-281089/7
Matrix: Water
Analysis Batch: 281089

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics (GRO) -C6-C10	1.00	0.957		mg/L		96	77 - 123

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	111		68 - 119

Lab Sample ID: LCSD 580-281089/8
Matrix: Water
Analysis Batch: 281089

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10	1.00	0.945		mg/L		94	77 - 123	1	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	108		68 - 119

Method: AK102 - DRO

Lab Sample ID: MB 590-17926/1-A
Matrix: Water
Analysis Batch: 17928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17926

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	ND		0.25	0.090	mg/L		07/26/18 09:39	07/26/18 11:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	94		50 - 150	07/26/18 09:39	07/26/18 11:32	1

TestAmerica Seattle

QC Sample Results

Client: Alaska Resources & Environment
 Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Method: AK102 - DRO (Continued)

Lab Sample ID: MB 590-17926/1-A
Matrix: Water
Analysis Batch: 17928

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17926

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
<i>n</i> -Triacontane-d62	91		50 - 150	07/26/18 09:39	07/26/18 11:32	1

Lab Sample ID: LCS 590-17926/2-A
Matrix: Water
Analysis Batch: 17928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17926

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	94		50 - 150
<i>n</i> -Triacontane-d62	92		50 - 150

Lab Sample ID: LCSD 590-17926/3-A
Matrix: Water
Analysis Batch: 17928

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17926

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
								RPD	Limit
Diesel Range Organics (DRO) (C10-C25)	1.60	1.37		mg/L		86	75 - 125	0	20

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
<i>o</i> -Terphenyl	95		50 - 150
<i>n</i> -Triacontane-d62	95		50 - 150

Lab Chronicle

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: MW1-718

Date Collected: 07/20/18 12:50

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	280129	07/26/18 22:50	CJ	TAL SEA
Total/NA	Analysis	AK101		1	280292	07/29/18 14:31	T1W	TAL SEA
Total/NA	Prep	3510C			17926	07/26/18 13:56	MO	TAL SPK
Total/NA	Analysis	AK102		1	17928	07/26/18 15:10	NMI	TAL SPK

Client Sample ID: MW2-718

Date Collected: 07/20/18 14:10

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	280369	07/30/18 20:02	TL1	TAL SEA
Total/NA	Analysis	8260C SIM		1	280485	07/31/18 13:19	W1T	TAL SEA
Total/NA	Analysis	8260C SIM	RA	1	280749	08/03/18 14:40	T1W	TAL SEA
Total/NA	Prep	3510C			17974	07/27/18 13:08	MO	TAL SPK
Total/NA	Analysis	8270D SIM		1	17985	07/30/18 16:18	NMI	TAL SPK
Total/NA	Analysis	AK101		1	281089	08/08/18 13:39	CJ	TAL SEA
Total/NA	Prep	3510C			17926	07/26/18 13:56	MO	TAL SPK
Total/NA	Analysis	AK102		1	17928	07/26/18 15:30	NMI	TAL SPK

Client Sample ID: MW3-718

Date Collected: 07/20/18 15:40

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	280369	07/30/18 20:28	TL1	TAL SEA
Total/NA	Analysis	8260C SIM		1	280485	07/31/18 13:42	W1T	TAL SEA
Total/NA	Prep	3510C			17974	07/27/18 13:08	MO	TAL SPK
Total/NA	Analysis	8270D SIM		10	17985	07/30/18 16:45	NMI	TAL SPK
Total/NA	Prep	3510C			17974	07/27/18 13:08	MO	TAL SPK
Total/NA	Analysis	8270D SIM		1	17985	07/30/18 17:38	NMI	TAL SPK
Total/NA	Analysis	AK101		1	281089	08/08/18 14:10	CJ	TAL SEA
Total/NA	Prep	3510C			17926	07/26/18 13:56	MO	TAL SPK
Total/NA	Analysis	AK102		1	17928	07/26/18 15:50	NMI	TAL SPK

Client Sample ID: D-718

Date Collected: 07/20/18 15:55

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	280369	07/30/18 20:54	TL1	TAL SEA
Total/NA	Analysis	8260C SIM		1	280485	07/31/18 14:05	W1T	TAL SEA
Total/NA	Prep	3510C			17974	07/27/18 13:08	MO	TAL SPK

TestAmerica Seattle

Lab Chronicle

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Client Sample ID: D-718

Date Collected: 07/20/18 15:55

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8270D SIM		10	17985	07/30/18 17:11	NMI	TAL SPK
Total/NA	Prep	3510C			17974	07/27/18 13:08	MO	TAL SPK
Total/NA	Analysis	8270D SIM		1	17985	07/30/18 18:05	NMI	TAL SPK
Total/NA	Analysis	AK101		1	281089	08/08/18 14:41	CJ	TAL SEA
Total/NA	Prep	3510C			17926	07/26/18 13:56	MO	TAL SPK
Total/NA	Analysis	AK102		1	17928	07/26/18 16:06	NMI	TAL SPK

Client Sample ID: Trip Blank

Date Collected: 07/20/18 07:00

Date Received: 07/24/18 12:50

Lab Sample ID: 580-79064-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	280369	07/30/18 13:56	TL1	TAL SEA
Total/NA	Analysis	AK101		1	280292	07/28/18 18:35	T1W	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Accreditation/Certification Summary

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Laboratory: TestAmerica Seattle

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-024	01-19-19
ANAB	DoD ELAP		L2236	01-19-19
ANAB	ISO/IEC 17025		L2236	01-19-19
California	State Program	9	2901	11-05-18
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-05-18
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-14-00126	02-10-20
Washington	State Program	10	C553	02-17-19

Laboratory: TestAmerica Spokane

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-025	12-07-18
Oregon	NELAP	10	4137	12-07-18
Washington	State Program	10	C569	01-06-19

Sample Summary

Client: Alaska Resources & Environment
Project/Site: Kobuk Feed & Fuel

TestAmerica Job ID: 580-79064-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79064-1	MW1-718	Water	07/20/18 12:50	07/24/18 12:50
580-79064-2	MW2-718	Water	07/20/18 14:10	07/24/18 12:50
580-79064-3	MW3-718	Water	07/20/18 15:40	07/24/18 12:50
580-79064-4	D-718	Water	07/20/18 15:55	07/24/18 12:50
580-79064-5	Trip Blank	Water	07/20/18 07:00	07/24/18 12:50

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**ALASKA
RESOURCES AND
ENVIRONMENTAL
SERVICES**

Loc: 580
79064

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

Chain of Custody Report

Client: Alaska Resources and Environmental Services			Invoice To: ARES P.O. Box 83050 Fairbanks, Alaska 99708				Laboratory Name: Test America, Inc Address: 57755 8th St. East Tacoma, WA 98424				Turnaround Request In Business Days Organic & Inorganic Analyses <table border="1"> <tr><td>15</td><td>7</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td><1</td></tr> </table> Petrofume Hydrocarbon Analyses <table border="1"> <tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td><1</td></tr> </table> Specify Other: Report Tier Levels: Tier II reporting requested (results + QC)				15	7	5	4	3	2	1	<1	5	4	3	2	1	<1
15	7	5	4	3	2	1	<1																					
5	4	3	2	1	<1																							
Report To: Lyle Greshover Address: ARES P.O. Box 83050 Email: lyle@ak-res.com Phone: (907) 374-3226 Fax: (907)374-3219			P.O. Number:																									
Project Name: Kobuk Feed & Fuel 0817			Preservative																									
Project Number:			HCL				N/A																					
Sampled By: Dustin Stahl			Requested Analyses																									
Sample Identification		Sampling Date/ Time		AK 101 GRO	AK 8260C BTEX	8260C VOC	AK 102 DRO	EPA 8270D SIM PAH					Matrix (W.S.O)	# of Cont.	Location / Comments	Lab ID												
MW1-718		07/20/2018 1250		X	X		X						W	8														
MW2-718		07/20/2018 1410		X		X	X	X					W	10														
MW3-718		07/20/2018 1540		X		X	X	X					W	10														
D-718		07/20/2018 1555		X		X	X	X					W	10														
Trip Blank		07/20/2018 0700		X	X								W	6	072318-01(V)													
Released By: <i>Megan Edic</i>		Date: 07/23/2018		Received By: <i>Francisco Luna Jr</i>				Date: 7/24/18																				
Print Name: Megan Edic		Firm: ARES		Time:				Print Name: Francisco Luna Jr				Firm: TASHIT				Time: 12:50												
Released By:		Date:		Received By:				Date:																				
Print Name:		Firm:		Time:				Print Name:				Firm:				Time:												
Additional Remarks: COOLER - 072318-01(V): MW1, MW2, MW3, D, TRIP BLANK												Temp.		Page 1 of 1														

COC REV 03 2018

072318



580-79064 Chain of Custody



Cooler ID No. 072318-01 (V)

TAL Work Order 79064

COOLER RECEIPT FORM

Project Kobuk Feed + Fuel

Cooler received on 7/24 and opened on 7/24 by Francisco Lunny, Jr

[Signature]
(signature)

Temperature upon receipt:

Cooler: Corr 2.7 °C, Uncorr 2.7 °C Therm ID: IR 5

Temp. Blank: Corr 1.1 °C, Uncorr 1.0 °C Therm ID: AZ

1. Were custody seals on outside of cooler and intact?
a. If yes, how many and where: 2 Front
b. Were signature and date correct? Yes YES NO
2. Were custody papers taped to lid inside cooler? YES NO
3. Were custody papers properly filled out(ink, signed, etc)? YES NO
4. Did you sign custody papers in the appropriate place? YES NO
5. Did you attach shipper's packing slip to this form? YES NO
6. What kind of packing material was used? Bubble, Gel Ice YES NO
7. Was sufficient ice used? YES NO
8. Were all bottles sealed in separate plastic bags? YES NO
9. Did all bottles arrive in good condition (unbroken)? YES NO
10. Were all bottle labels complete (no., date, signed, pres, etc)? YES NO
11. Did all bottle labels and tags agree with custody papers? YES NO
12. Were correct bottles used for the test indicated? YES NO
13. If present, were voa vials checked for absence of airbubbles and noted if found? YES NO
14. Adequate volume of voa vials received per sample? YES NO
15. Was sufficient amount of sample sent in each bottle? YES NO
16. Were correct preservatives used? YES NO
17. Were extra labels added to pre-tared containers? YES NO
18. Corrective action taken, if necessary:
a. Name of person contacted: _____
b. Date: _____

Page 33 of 38

10/15/10

8/13/2010



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TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 187638

Custody Seal
 DATE 7/23/18
 SIGNATURE [Signature]

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 187638

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 187637

Custody Seal
 DATE 7/23/18
 SIGNATURE [Signature]

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 187637

072318-01(V)

Self-Service Pick Up



P.O. Box 68900 Seattle, WA 98188
800-225-2752
AlaskaCargo.com

Air Waybill Number

027-37184033

Total pieces

1

Total weight (lbs)

39.0

Shipper

Alaska Resource and
Environmental S
3520 International St,
Fairbanks

Consignee

Test America Laboratories Inc
5755 8th Street E,
Tacoma

Pieces	Weight (lbs)	Origin/Dest	Description	Arriving Flight Details	Storage
1	39.0	FAI/SEA	CHILL WATER SAM	124 7/23/2018	COOLER

The undersigned acknowledges the receipt of above mentioned consignment complete and in good condition.

Picked up by

Francisco Luna

Date

7/24/2018

Time

11:40 AM



TestAmerica Seattle

5755 8th Street East
Tacoma, WA 98424
Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:	
Client Contact: Shipping/Receiving		Phone:		E-Mail:		State of Origin:		Page:	
Company: TestAmerica Laboratories, Inc		Address: 11922 East 1st Ave.		Due Date Requested: 8/3/2018		Analysis Requested		Preservation Codes:	
City: Spokane		TAT Requested (days):		PO #:		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) AK102_103/3510C_LVI_14d (MOD) DRO 82700_31M/3510C_LVI Polycyclic Aromatic Hydrocarbons		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA	
State, Zip: WA, 99206		Project #: 58011466		WO #:				M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone: 509-924-9200(Tel) 509-924-9290(Fax)		SSOW#:		Project Name: Kobuk Feed & Fuel				Other:	
Email:		Site:		Project #: 58011466				Special Instructions/Note:	
Sample Identification - Client ID (Lab ID)		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=wasteflot, BT=Tissue, A=Air)	
						Preservation Code:			
MW1-718 (580-79064-1)		7/20/18		12:50 Alaskan		Water		2	
MW2-718 (580-79064-2)		7/20/18		14:10 Alaskan		Water		4	
MW3-718 (580-79064-3)		7/20/18		15:40 Alaskan		Water		4	
D-718 (580-79064-4)		7/20/18		15:55 Alaskan		Water		4	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.									
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
Unconfirmed					<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (specify)					Primary Deliverable Rank: 2				
Special Instructions/QC Requirements:									
Empty Kit Relinquished by:		Date:		Time:		Method / Shipment			
Relinquished by: <i>B. Sauer</i>		Date/Time: 7/25/18 1305		Company: SE TA		Received by: <i>Sheela Krad</i>		Date/Time: 7/26/18 1330	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.: 2178491		Cooler Temperature(s) °C and Other Remarks: 2.1°C IR001					

Login Sample Receipt Checklist

Client: Alaska Resources & Environment

Job Number: 580-79064-1

Login Number: 79064

List Source: TestAmerica Seattle

List Number: 1

Creator: Gall, Brandon A

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Alaska Resources & Environment

Job Number: 580-79064-1

Login Number: 79064
List Number: 2
Creator: Kratz, Sheila J

List Source: TestAmerica Spokane
List Creation: 07/26/18 01:51 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	#478491
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	2.1IR004
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	No analysis requiring residual chlorine check assigned.

Laboratory Data Review Checklist

Completed By:

Dustin Stahl

Title:

Environmental Specialist

Date:

2/13/2019

CS Report Name:

Kobuk Feed and Fuel 2018 Groundwater Monitoring Well Report

Consultant Firm:

ARES

Laboratory Name:

Test America Seattle

Laboratory Report Number:

580-79064

ADEC File Number:

100.26.137

Hazard Identification Number:

24434

1. Laboratory

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

Yes No

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

Comments:

Samples requiring DRO and PAH analysis were subcontracted to TestAmerica Spokane from Test America Seattle.

2. Chain of Custody (CoC)

a. CoC information completed, signed, and dated (including released/received by)?

Yes No

Comments:

b. Correct Analyses requested?

Yes No

Comments:

Analysis of the Trip Blank for VOC’s by EPA8260C/8260CSIM should have been performed but was left off of the COC in error.

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes No

Comments:

The coolers arrived at both labs within the acceptable temperature range.

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

Yes No

Comments:

Samples arrived in good condition and properly preserved.

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

Yes No

Comments:

Samples arrived in good condition and properly preserved.

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

Comments:

There were no discrepancies.

e. Data quality or usability affected?

Yes No

Comments:

N/A-There were no discrepancies.

4. Case Narrative

a. Present and understandable?

Yes No

Comments:

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

Yes No

Comments:

The case narrative identified LCS/LCSD %R and RPD failures, samples that were re-analyzed outside of hold time, and surrogate recovery failures.

c. Were all corrective actions documented?

Yes No

Comments:

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

Yes No

Comments:

The case narrative does not discuss the effect on data quality or usability.

5. Samples Results

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

Yes No

Comments:

b. All applicable holding times met?

Yes No

Comments:

AK 101-Samples MW2-718, MW3-718, and D-718 were re-analyzed outside of hold time due to QC failures in the initial analysis.

c. All soils reported on a dry weight basis?

Yes No

Comments:

Water was the matrix for all samples.

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

Yes No

Comments:

1,2,3-Trichloropropane, 1,1,2-Trichloroethane, 1,2-Dibromoethane, and Vinyl chloride have detection limits that exceed ADEC CUL's in one or more samples.

e. Data quality or usability affected?

Yes No

Comments:

Data quality is affected. Analytes with elevated detection limits could be present at concentrations that exceed ADEC cleanup levels. Data is still usable. Sample results with detection limits that exceed ADEC CUL's are highlighted in blue in the analytical summary table

6. QC Samples

a. Method Blank

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

Yes No

Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

Yes No

Comments:

iii. If above LOQ, what samples are affected

Comments:

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

Yes No

Comments:

N/A- All method blank results were less than limit of quantitation.

v. Data quality or usability affected?

Comments:

N/A- All method blank results were less than limit of quantitation.

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

Comments:

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

Yes No

Comments:

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

Yes No

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

Comments:

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

Comments:

8260C SIM- The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 580-280485 recovered outside control limits for the following analytes: Vinyl chloride and Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

8260C SIM- The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for batch analytical batch 580-280485 recovered outside control limits for the following analytes: Bromomethane.

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

Yes No

Comments:

The analyte recoveries and the RPD both exceeded the upper control limit and the associated analytes were not detected in the samples, therefore no data flags were required.

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

Comments:

Data quality and usability are not affected. The analyte recoveries and the RPD both exceeded the upper control limit and the associated analytes were not detected in the samples.

c. Surrogates – Organics Only

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

Yes No

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

Comments:

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

Yes No

Comments:

AK101- Surrogate recovery for the following samples were outside control limits: MW1-718 (580-79064-1), MW3-718 (580-79064-3) and D-718 (580-79064-4). Evidence of matrix interference is present.

8270D SIM- Surrogate recovery for the following samples were outside control limits: MW3-718 (580-79064-3) and D-718 (580-79064-4). Evidence of matrix interference due to non-target analytes is present.

iv. Data quality or usability affected?

Comments:

AK101- Data quality is affected. All the surrogates recovered above the upper acceptance limit. Detected analytes are considered biased high and are qualified with the QH data flag. Data is usable.

8270DSIM- Sample D-718 data quality is affected. The surrogate recovered low due to a required 10X dilution. Detected sample results and non-detects have an uncertain bias and are qualified with the QN data flag.

8270DSIM- Sample MW3-718 data quality is affected. The surrogate recovered above the upper acceptance limit. Detected sample results are considered biased high and are qualified with the QH data flag. If the result was previously qualified with the QN data flag due to other QC errors the QN qualifier remains. Non-detect results do not require qualification. Data is still usable.

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

Comments:

The trip blank was not analyzed for VOC's by 8260C/8260CSIM, because the analysis was not requested on the COC in error. The Trip Blank was still analyzed for BTEX by 8260C and GRO by AK 101.

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

Comments:

iii. All results less than LOQ?

Yes No

Comments:

iv. If above LOQ, what samples are affected?

Yes No

Comments:

v. Data quality or usability affected?

Comments:

Data quality is affected. There is no way to determine if cross contamination could have occurred for any VOC analytes that were detected in the samples. Data is still usable.

e. Field Duplicate

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

Yes No

Comments:

ii. Submitted blind to lab?

Yes No

Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No

Comments:

The calculated Sample/Blind Field Duplicate RPD's for DRO (113.8%), 2-Methylnaphthalene (46.2%), Benzo[a]anthracene (83.3%), and Phenanthrene exceeded the recommended RPD limit of 30% in water.

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

Comments:

Data quality is affected. Results from analytes with RPD failures should be viewed qualitatively rather than quantitatively. Results are qualified with a QN flag in the analytical summary table.

f. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below).

Yes No Not Applicable

Comments:

A decontamination blank and/or equipment blank was not required for this sampling event. New, dedicated, disposable sampling supplies were used to collect the samples.

i. All results less than LOQ?

Yes No

Comments:

N/A

ii. If above LOQ, what samples are affected?

Comments:

N/A

iii. Data quality or usability affected?

Comments:

N/A

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

a. Defined and appropriate?

Yes No

Comments:

Appendix D:
Analytical Results Summary Table

Former Kobuk Feed and Fuel 2018 Groundwater Analytical Results Summary Table

Sample ID Location ID Collection Date/Time Lab Sample ID Matrix Description		MW1-718 MW-1 7/20/2018 1250 580-79064-1 Water	MW2-718 MW-2 7/20/2018 1410 580-79064-2 Water	MW3-718 MW-3 7/20/2018 1540 580-79064-3 Water	D-718 MW-3 7/20/2018 1555 580-79064-4 Water Duplicate of MW3-718		
Method	Units	Analyte	ADEC Cleanup Level	Analytical Results [LOD]	Analytical Results [LOD]	Analytical Results [LOD]	Analytical Results [LOD]
AK 101	µg/L	GRO	2200	100 J [250] QH	790 [250] H	800 [250] H QH	830 [250] H QH
AK 102	µg/L	DRO	1500	ND [250]	460 [250] QN	5100 [250] QN	1400 [250] QN
8260C	µg/L	Benzene	4.6	ND [3]	20 [0.5]	0.16 [0.5]	0.19 [0.5]
8260C	µg/L	Ethylbenzene	15	ND [3]	20 [3]	9.5 [3]	9.6 [3]
8260C	µg/L	o-Xylene	NS	ND [3]	20 [2]	27 [2]	28 [2]
8260C	µg/L	m-Xylene & p-Xylene	NS	ND [2]	52 [3]	59 [3]	60 [3]
8260C	µg/L	Toluene	1100	ND [2]	15 [2]	ND [2]	ND [2]
EPA 8270D SIM	µg/L	1-Methylnaphthalene	11	NA	0.33 [0.091]	24 [0.9] QH	32 [0.91] QN
EPA 8270D SIM	µg/L	2-Methylnaphthalene	36	NA	0.12 [0.091] QN	20 [0.9] QN	32 [0.91] QN
EPA 8270D SIM	µg/L	Acenaphthene	530	NA	0.032 [0.091] J	23 [0.9] QH	24 [0.91] QN
EPA 8270D SIM	µg/L	Acenaphthylene	260	NA	ND [0.091]	ND [0.09]	0.4 [0.091] QN
EPA 8270D SIM	µg/L	Anthracene	43	NA	ND [0.091]	ND [0.09]	0.19 [0.091] QN
EPA 8270D SIM	µg/L	Benzo[a]anthracene	0.30	NA	ND [0.091]	0.14 [0.091] QN	0.34 [0.091] QN
EPA 8270D SIM	µg/L	Benzo[a]pyrene	0.25	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Benzo[b]fluoranthene	2.5	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Benzo[g,h,i]perylene	0.26	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Benzo[k]fluoranthene	0.80	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Chrysene	2.0	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Dibenz(a,h)anthracene	0.25	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Fluoranthene	260	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Fluorene	290	NA	0.027 [0.091] J	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Indeno[1,2,3-cd]pyrene	0.19	NA	ND [0.091]	1.3 [0.09] QN	1.6 [0.091] QN
EPA 8270D SIM	µg/L	Naphthalene	1.7	NA	2.7 [0.091]	ND [0.09]	ND [0.091] QN
EPA 8270D SIM	µg/L	Phenanthrene	170	NA	ND [0.091]	0.38 [0.09] QH	1.5 [0.091] QN
EPA 8270D SIM	µg/L	Pyrene	120	NA	ND [0.091]	ND [0.09]	ND [0.091] QN
8260C	µg/L	1,1,1-Trichloroethane	8000	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	1,1-Dichloroethane	28	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	1,1-Dichloropropene	NS	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	1,2,3-Trichlorobenzene	7.0	NA	ND [5]	ND [5]	ND [5]
8260C	µg/L	1,2,3-Trichloropropane	0.0075	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	1,2,4-Trichlorobenzene	4.0	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	1,2,4-Trimethylbenzene	15	NA	9.5 [3]	81 [3]	82 [3]
8260C	µg/L	1,2-Dibromo-3-Chloropropane	NS	NA	ND [10]	ND [10]	ND [10]
8260C	µg/L	1,2-Dichlorobenzene	300	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	1,2-Dichloropropane	4.4	NA	ND [1]	ND [1]	ND [1]
8260C	µg/L	1,3,5-Trimethylbenzene	120	NA	4.1 [3]	35 [3]	36 [3]
8260C	µg/L	1,3-Dichlorobenzene	300	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	1,3-Dichloropropane	NS	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	2,2-Dichloropropane	NS	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	2-Chlorotoluene	NS	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	4-Chlorotoluene	NS	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	4-Isopropyltoluene	NS	NA	ND [3]	4.6 [3]	4.6 [3]
8260C	µg/L	Bromobenzene	62	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	Bromochloromethane	NS	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	Carbon tetrachloride	4.6	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	Chlorobenzene	78	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	Chloroethane	21000	NA	ND [5]	ND [5]	ND [5]
8260C	µg/L	Chloromethane	190	NA	ND [20]	ND [20]	ND [20]
8260C	µg/L	cis-1,2-Dichloroethene	36	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	Dichlorodifluoromethane	200	NA	ND [10]	ND [10]	ND [10]
8260C	µg/L	Ethylbenzene	15	NA	20 [3]	9.5 [3]	9.6 [3]
8260C	µg/L	Isopropylbenzene	450	NA	3.4 [2]	9.6 [2]	9.4 [2]
8260C	µg/L	Methyl tert-butyl ether	140	NA	ND [2]	ND [2]	ND [2]
8260C	µg/L	Methylene Chloride	110	NA	ND [5]	ND [5]	ND [5]
8260C	µg/L	m-Xylene & p-Xylene	NS	NA	52 [3]	59 [3]	60 [3]
8260C	µg/L	n-Butylbenzene	1000	NA	ND [3]	6.2 [3]	6 [3]
8260C	µg/L	N-Propylbenzene	660	NA	3.5 [3]	12 [3]	12 [3]

Table Notes and Data Flags are defined at the end of the table

Blue shade indicates ND result has LOD that exceeds ADEC cleanup level

Gray shade indicates ADEC cleanup level exceedance

Former Kobuk Feed and Fuel 2018 Groundwater Analytical Results Summary Table

Sample ID Location ID Collection Date/Time Lab Sample ID Matrix Description		MW1-718 MW-1 7/20/2018 1250 580-79064-1 Water	MW2-718 MW-2 7/20/2018 1410 580-79064-2 Water	MW3-718 MW-3 7/20/2018 1540 580-79064-3 Water	D-718 MW-3 7/20/2018 1555 580-79064-4 Water Duplicate of MW3-718		
Method	Units	Analyte	ADEC Cleanup Level	Analytical Results [LOD]	Analytical Results [LOD]	Analytical Results [LOD]	Analytical Results [LOD]
8260C	µg/L	o-Xylene	NS	NA	20 [2]	27 [2]	28 [2]
8260C	µg/L	sec-Butylbenzene	2000	NA	0.6 [3] J	3.4 [3]	3.2 [3]
8260C	µg/L	Styrene	1200	NA	ND [5]	ND [5]	ND [5]
8260C	µg/L	t-Butylbenzene	690	NA	ND [3]	0.64 [3] J	0.65 [3]
8260C	µg/L	Toluene	1100	NA	15 [2]	ND [2]	ND [2]
8260C	µg/L	trans-1,2-Dichloroethene	360	NA	ND [3]	ND [3]	ND [3]
8260C	µg/L	Trichlorofluoromethane	5200	NA	ND [3]	ND [3]	ND [3]
8260C SIM	µg/L	1,1,1,2-Tetrachloroethane	5.7	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	1,1,2,2-Tetrachloroethane	0.76	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	1,1,2-Trichloroethane	0.41	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	1,1-Dichloroethene	280	NA	0.24 [0.5] J	ND [0.5]	ND [0.5]
8260C SIM	µg/L	1,2-Dibromoethane	0.075	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	1,2-Dichloroethane	1.7	NA	0.18 [0.5] J	ND [0.5]	ND [0.5]
8260C SIM	µg/L	1,4-Dichlorobenzene	4.8	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Benzene	4.6	NA	20 [0.5]	0.16 [0.5] J	0.19 [0.5] J
8260C SIM	µg/L	Bromodichloromethane	1.3	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Bromoform	33	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Bromomethane	7.5	NA	ND [0.5] *	ND [0.5] *	ND [0.5] *
8260C SIM	µg/L	Chloroform	2.2	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	cis-1,3-Dichloropropene	NS	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Dibromochloromethane	8.7	NA	ND [0.5]	ND [0.5]	0.42 [0.5]
8260C SIM	µg/L	Dibromomethane	8.3	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Hexachlorobutadiene	1.4	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Naphthalene	1.7	NA	5.2 [0.5]	33 [0.5]	33 [0.5]
8260C SIM	µg/L	Tetrachloroethene	41	NA	0.19 [0.5] J	ND [0.5]	ND [0.5]
8260C SIM	µg/L	trans-1,3-Dichloropropene	NS	NA	ND [0.5]	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Trichloroethene	2.8	NA	0.055 [0.5] J	ND [0.5]	ND [0.5]
8260C SIM	µg/L	Vinyl chloride	0.19	NA	ND [0.5]	ND [0.5] *	ND [0.5] *

Table Notes and Data Flags are defined at the end of the table
 Blue shade indicates ND result has LOD that exceeds ADEC cleanup level
 Gray shade indicates ADEC cleanup level exceedance

Former Kobuk Feed and Fuel 2018 Groundwater Analytical Results Summary Table

Data Flag / Abbreviation	Definition
B	Analyte result is considered a high estimated value due to contamination present in the method, trip, or equipment blank. ND results are not flagged.
D	The reported value is from a dilution.
DL	Detection Limit
H	Analyte result is considered a low estimate due to a hold time exceedance.
J	Analyte result is considered an estimated value because the level is below the laboratory LOQ but above the DL
LL	(Low Level) Analysis with lower reporting limits than standard methanol preservative analysis.
LOD	Limit of Detection
LOQ	Limit of Quantitation (equivalent to Method Reporting Limit)
M	Manual integrated compound.
ND	(Not Detected) Analyte not detected above the Method Detection Limit.
NS	(Not Stipulated) Cleanup level not stipulated by ADEC.
NA	Not Applicable
QH, QL, QN	Analyte result is considered an estimated value biased (high, low, uncertain) due to a quality control failure.
R	Analyte result is rejected; the result is not usable. Note that "R" replaces the chemical result (no result shall be reported with an "R" flag).
RL	Reporting Limit

Notes
ADEC regulatory limits / cleanup levels are sourced from 18 AAC 75.345 Groundwater Human Health Cleanup Levels Table C Revised January 2019. Results column consists of the results if the compound is detected above the method detection limit. Otherwise it gives the ND symbol. The number in brackets is the LOD.

Former Kobuk Feed and Fuel, 2017 Analytical Groundwater Results Summary Table, Sampling Series 0817

Sample ID Collection Date Sample Location Area Description Depth (feet below ground surface) Matrix				MW1-0817 8/16/2017 Kobuk Feed and Fuel 11.53-16.76 Water	MW2-0817 8/16/2017 Kobuk Feed and Fuel 12.95-18.02 Water	MW3-0817 8/16/2017 Kobuk Feed and Fuel 12.53-18.04 Water	DUP-0817 8/16/2017 Kobuk Feed and Fuel Duplicate of MW2-0817 12.95-18.02 Water				
Method	Analyte	Units	ADEC cleanup level (July 1, 2017)	Analytical Results [DL]	Qualifiers	Analytical Results [DL]	Qualifiers	Analytical Results [DL]	Qualifiers	Analytical Results [DL]	Qualifiers
AK 101	GRO	µg/L	2200	ND [330]		840 [330]	J	1100 [330]		1100 [330]	
AK 102	DRO	µg/L	1500	270 [23]		940 [22]		4400 [23]		930 [22]	
EPA 8021B	Benzene	µg/L	4.6	ND [0.42]		NA		NA		NA	
EPA 8021B	Ethylbenzene	µg/L	15	ND [0.21]		NA		NA		NA	
EPA 8021B	o-Xylene	µg/L	NS	ND [0.72]		NA		NA		NA	
EPA 8021B	m-Xylene & p-Xylene	µg/L	NS	ND [0.15]		NA		NA		NA	
EPA 8021B	Toluene	µg/L	1100	ND [0.24]		NA		NA		NA	
EPA 8270D SIM	1-Methylnaphthalene	µg/L	11	NA		0.39 [0.0061]		25 [0.061]		0.4 [0.0061]	
EPA 8270D SIM	2-Methylnaphthalene	µg/L	36	NA		0.12 [0.0092]		19 [0.0092]		0.14 [0.0092]	
EPA 8270D SIM	Acenaphthene	µg/L	530	NA		0.022 [0.002]		0.27 [0.002]		0.017 [0.002]	J
EPA 8270D SIM	Acenaphthylene	µg/L	260	NA		ND [0.002]		0.11 [0.002]		ND [0.002]	
EPA 8270D SIM	Anthracene	µg/L	43	NA		ND [0.0031]		0.012 [0.0031]	J	ND [0.0031]	
EPA 8270D SIM	Benzo[a]anthracene	µg/L	0.12	NA		0.0057 [0.002]	J	ND [0.002]		ND [0.002]	
EPA 8270D SIM	Benzo[a]pyrene	µg/L	0.034	NA		0.0032 [0.0031]	J	ND [0.0031]		ND [0.0031]	
EPA 8270D SIM	Benzo[b]fluoranthene	µg/L	0.34	NA		ND [0.0082]		ND [0.0082]		ND [0.0082]	
EPA 8270D SIM	Benzo[g,h,i]perylene	µg/L	0.26	NA		0.0044 [0.0031]	J	ND [0.0031]		ND [0.0031]	
EPA 8270D SIM	Benzo[k]fluoranthene	µg/L	0.80	NA		ND [0.0092]		ND [0.0092]		ND [0.0092]	
EPA 8270D SIM	Chrysene	µg/L	2.0	NA		ND [0.0061]		ND [0.0061]		ND [0.0061]	
EPA 8270D SIM	Dibenz[a,h]anthracene	µg/L	0.034	NA		ND [0.002]		ND [0.002]		ND [0.002]	
EPA 8270D SIM	Fluoranthene	µg/L	260	NA		ND [0.002]		ND [0.002]		ND [0.002]	
EPA 8270D SIM	Fluorene	µg/L	290	NA		0.023 [0.0031]		0.99 [0.0031]		0.023 [0.0031]	
EPA 8270D SIM	Indeno[1,2,3-cd]pyrene	µg/L	0.19	NA		ND [0.0072]		ND [0.0072]		ND [0.0072]	
EPA 8270D SIM	Naphthalene	µg/L	1.7	NA		2.3 [0.013]		29 [0.13]		2.3 [0.013]	
EPA 8270D SIM	Phenanthrene	µg/L	170	NA		0.0084 [0.0041]	J B	0.27 [0.0041]	B	0.0065 [0.0041]	J B
EPA 8270D SIM	Pyrene	µg/L	120	NA		0.0062 [0.0041]	J B	ND [0.0041]		ND [0.0041]	
8260C	1,1,1-Trichloroethane	µg/L	8000	NA		ND [0.32]		ND [0.32]		ND [0.32]	
8260C	1,1-Dichloroethane	µg/L	28	NA		ND [0.22]		ND [0.22]		ND [0.22]	
8260C	1,1-Dichloropropene	µg/L	NS	NA		ND [0.5]		ND [0.5]		ND [0.5]	
8260C	1,2,3-Trichlorobenzene	µg/L	7.0	NA		ND [0.46]		ND [0.46]		ND [0.46]	
8260C	1,2,3-Trichloropropane	µg/L	0.0075	NA		ND [0.41]		ND [0.41]		ND [0.41]	
8260C	1,2,4-Trichlorobenzene	µg/L	4.0	NA		ND [0.15]		ND [0.15]		ND [0.15]	
8260C	1,2,4-Trimethylbenzene	µg/L	15	NA		5.2 [0.42]		110 [4.2]	H QN	4.7 [0.42]	
8260C	1,2-Dibromo-3-Chloropropane	µg/L	NS	NA		ND [1.8]		ND [1.8]		ND [1.8]	
8260C	1,2-Dichlorobenzene	µg/L	300	NA		ND [0.2]		ND [0.2]		ND [0.2]	
8260C	1,2-Dichloropropane	µg/L	4.4	NA		ND [0.18]		ND [0.18]		ND [0.18]	
8260C	1,3,5-Trimethylbenzene	µg/L	120	NA		2.8 [0.26]	J	46 [0.26]		2.2 [0.26]	J
8260C	1,3-Dichlorobenzene	µg/L	300	NA		ND [0.18]		ND [0.18]		ND [0.18]	
8260C	1,3-Dichloropropane	µg/L	NS	NA		ND [0.35]		ND [0.35]		ND [0.35]	
8260C	2,2-Dichloropropane	µg/L	NS	NA		ND [0.32]		ND [0.32]		ND [0.32]	
8260C	2-Chlorotoluene	µg/L	NS	NA		ND [0.3]		ND [0.3]		ND [0.3]	
8260C	4-Chlorotoluene	µg/L	NS	NA		ND [0.28]		ND [0.28]		ND [0.28]	
8260C	4-Isopropyltoluene	µg/L	NS	NA		ND [0.26]		7.2 [0.26]		ND [0.26]	
8260C	Bromobenzene	µg/L	62	NA		ND [0.18]		ND [0.18]		ND [0.18]	
8260C	Bromochloromethane	µg/L	NS	NA		ND [0.29]		ND [0.29]		ND [0.29]	
8260C	Carbon tetrachloride	µg/L	4.6	NA		ND [0.3]		ND [0.3]		ND [0.3]	
8260C	Chlorobenzene	µg/L	78	NA		ND [0.17]		ND [0.17]		ND [0.17]	
8260C	Chloroethane	µg/L	21000	NA		ND [1.1]		ND [1.1]		ND [1.1]	
8260C	Chloromethane	µg/L	190	NA		ND [5.4]		ND [5.4]		ND [5.4]	
8260C	Dichlorodifluoromethane	µg/L	200	NA		ND [0.98]		ND [0.98]		1.1 [0.98]	J
8260C	Ethylbenzene	µg/L	15	NA		14 [0.21]		27 [0.21]		11 [0.21]	
8260C	Isopropylbenzene	µg/L	450	NA		3.6 [0.3]		17 [0.3]		2.8 [0.3]	
8260C	Methyl tert-butyl ether	µg/L	140	NA		ND [0.44]		ND [0.44]		ND [0.44]	

Table Notes and Data Flags are defined at the end of the table
 Result value for non-detect sample results is equivalent to laboratory LOD
 Solid shade indicates ADEC cleanup level exceedance

**Former Kobuck Feed and Fuel 2017 Groundwater Monitoring
Table Definitions and Notes**

Data Flag / Abbreviation	Definition
DL	Detection Limit
J	The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
LL	(Low Level) Analysis with lower reporting limits than standard methanol preservative analysis.
LOD	Limit of Detection
LOQ	Limit of Quantitation (equivalent to Method Reporting Limit)
M	Manual integrated compound.
ND	(Not Detected) Analyte not detected above the Method Detection Limit.
NS	(Not Stipulated) Cleanup level not stipulated by ADEC.
NA	Not Applicable
QN	One or more quality control criteria failed. Sample concentration is considered estimated with an unknown bias.
R	Analyte result has been rejected due to QC failure. Data is not usable.
RL	(Reporting Limit) The analyte was undetected, however due to a LOQ above the ADEC regulatory limit, it is possible that the concentration is present below the LOQ, but above ADEC regulatory limits.
U	Undetected at the Limit of Detection

Notes
ADEC regulatory limits / cleanup levels for groundwater samples from 18AAC 75.345 Table C. Revised October 2018.
Results column consists of the results if the compound is detected above the method detection limit. Otherwise it gives the LOD and the ND symbol. The number in brackets is the DL.

Appendix E:
Field Notes & Groundwater Sampling Field Data
Sheets

7:20-18 Kobuk Feed and Fuel

(0945) D. Stahl and J. Thomas onsite for ARES.
Walk site and find wells.

(0955) D. Stahl offsite, office not open yet, fill out
sample labels

(1025) Get keys from office, move to MW1

(1055) Don't have knife, leaving site to get one

(1135) Back on-site at MW1, prep to sample,
Having issues with bladder pump/decontamination

(1220) Start purging, MW01

(1250) Sample MW1-718

CR0, BTEX, DRO

(1300) Decon bladder pump, load truck, move to MW2

(1347) Begin purging MW2

(1410) Sample MW2-718

CR0, DRO, VOC, PAH

(1515) Begin purging MW3

(1540) Sample MW3-718

CR0, DRO, VOC, PAH

(1555) Collect Duplicate D-718

(1635) Offsite, Duplicate of sample
MW3-718



Alaska Resources and Environmental Services

Ground Water Monitoring Well Data Sheet

Site Name: Kobuk Feed and Fuel	Well/ Sample ID: MW1-718
Location:	Initial Depth to Water (DTW): 14.65 13.65
Client:	Total Well Depth (TD):
Sampler: J. Thomas	Well Diameter: 1.5"
Date: 7-20-18	Purge Method: Peristaltic (DRO, PAH), Bladder (VOC, BTEX, GRO)
Sample Method: Low Flow	Flow Rate: 0.4 L, 0.3 L

Time	ph	SC	DO	Temp (°C)	ORP	DTW (feet)	Cumulative Volume(L)	Observations
1222	6.67	0.755	4.08	5.21	-21.3	14.65	1.2 L	
1225	6.85	0.702	2.63	4.54	-23.9	14.68	2.4	
1228	6.92	0.664	1.84	5.76	-28.7	15.12	3.6	
1231	6.94	0.659	1.65	5.80	-29.1	13.95	4.5	
1234	6.96	0.652	1.22	5.93	-29.7	13.89	5.4	
1237	6.98	0.643	0.87	6.28	-30.8	13.89	6.3	
1240	6.98	0.645	0.75	6.14	-31.5	13.89	7.2	
1243	6.99	0.640	0.50	6.02	-32.1	13.89	8.1	
1246	6.99	0.641	0.45	5.98	-32.2	13.89	9.0	
1249	6.99	0.642	0.44	5.90	-32.1	13.89	9.9	Stable

Did Well Dewater? No	Start Purge Time: 1220	DTW prior to sample: 13.89
Odor: None	Stop Purge Time: 1249	Start Sample Time: 1250
Color: Colorless/Slightly brown	Total Purge Volume: 10L	Total Sample Volume:
Water Quality Meter Model: VSI556 MPS	Serial ID: 11H100848	
Water Level Indicator Model:	Serial ID:	

Notes:



Alaska Resources and Environmental Services

Ground Water Monitoring Well Data Sheet

Site Name: <u>Kobuk Feed & Fuel</u>	Well/ Sample ID: <u>MW2-718</u>
Location:	Initial Depth to Water (DTW): <u>13.08</u>
Client:	Total Well Depth (TD):
Sampler: <u>J. Thomas</u>	Well Diameter: <u>1.5"</u>
Date: <u>7-20-19</u>	Purge Method: <u>Peristaltic</u>
Sample Method: <u>Bladder</u>	Flow Rate: <u>0.3 L/M</u>

Time	ph	SC	DO	Temp (°C)	ORP	DTW (feet)	Cumulative Volume (L)	Observations
1350 1347.5	7.08	0.628	1.30	6.00	-18.1	13.16	0.9	
1353 1350.5	6.91	0.604	1.02	4.73	-21.9	13.24	1.8	
1356	6.87	0.596	0.85	4.60	-25.8	13.24	2.7	
1359	6.85	0.570	0.57	4.67	-28.8	13.24	3.6	
1402	6.85	0.567	0.49	4.59	-29.8	13.24	4.5	
1405	6.86	0.567	0.45	4.54	-30.4	13.24	5.4	
1408	6.87	0.566	0.42	4.46	-31.0	13.24	6.3	Stable

Did Well Dewater? <u>No</u>	Start Purge Time: 1344 <u>1347</u>	DTW prior to sample: <u>13.08</u>
Odor: <u>None</u>	Stop Purge Time: <u>1408</u>	Start Sample Time: <u>1410</u>
Color: <u>Colorless</u>	Total Purge Volume: <u>6.3 L</u>	Total Sample Volume:
Water Quality Meter Model: <u>YSI 556 MPS</u>	Serial ID:	
Water Level Indicator Model:	Serial ID:	

Notes:



Alaska Resources and Environmental Services

Ground Water Monitoring Well Data Sheet

Site Name: <u>Kotuk Feed and Fuel</u>	Well/ Sample ID: <u>MW3</u>
Location:	Initial Depth to Water (DTW): <u>12.77</u>
Client:	Total Well Depth (TD):
Sampler: <u>J. Thomas</u>	Well Diameter: <u>1.5"</u>
Date: <u>7-20-18</u>	Purge Method: <u>Peristaltic</u>
Sample Method: <u>Bladder</u>	Flow Rate: <u>0.15 L/min</u>

Time	ph	SC	DO	Temp (°C)	ORP	DTW (feet)	Cumulative Volume(L)	Observations
1518	7.19	1.245	3.13	6.92	-34.0	14.27	0.45	
1521	6.92	0.883	0.83	6.93	-34.6	14.81	0.90	
1527	6.79	0.864	1.88	8.34	-32.7	15.11	1.35	
1530	6.77	0.863	1.84	8.38	-30.0	15.15	1.80	
1533	6.76	0.865	1.85	8.26	-27.8	15.15	2.25	
1536	6.75	0.863	1.87	8.20	-26.9	15.15	2.70	

Did Well Dewater? <u>No</u>	Start Purge Time: <u>1515</u>	DTW prior to sample: <u>12.77</u>
Odor: <u>N slight</u>	Stop Purge Time:	Start Sample Time: <u>1540</u>
Color: <u>Slightly brown</u>	Total Purge Volume:	Total Sample Volume:
Water Quality Meter Model: <u>YSI 556 MP3</u>	Serial ID:	
Water Level Indicator Model:	Serial ID:	

Notes: Between 1518 + 1527 slowed water flow repeatedly to get water level to equilibrate. Collected D-718 @ 1555 For GEO, DRO, VOC, PAH

Appendix F:
Disposal Documents



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

Contaminated Soil Transport and Treatment Approval Form

DEC HAZARD ID #	NAME OF CONTAMINATED SITE	
25546, 26466, 24434	BSL Vehicle Rollover - MP 205 Rich, 536 4th Avenue, Kobuk Feed and Fuel	
SPILL LOCATION		
IDW- Purge water from MW Sampling		
CONTAMINATED SOIL'S CURRENT LOCATION		SOURCE OF THE CONTAMINATION
(Water) ARES OFFICE Warm Storage 0.10		GW Monitoring due to Fuel Releases
TYPE OF CONTAMINATION	ESTIMATED VOLUME	DATE(S) STOCKPILE GENERATED
VOC's, GRO, DRO, RRO	45 Gallons	2017/2018 Sampling events
POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, BTEX, and/or Chlorinated Solvents)		
VOC's GRO, DRO, RRO		
COMMENTS		
Groundwater/Purge Water generated during annual groundwater monitoring of historic fuel releases.		

Facility Accepting the Contaminated Soil

NAME OF THE FACILITY	ADDRESS/PHONE NUMBER
OIT Inc.	Moose Creek facility (907) 488-4899

Responsible Party and Contractor Information

BUSINESS/NAME	ADDRESS/PHONE NUMBER
ARES	3520 International Street Fairbanks, AK 99701 (907) 907-374-3226

Dustin Stahl

Environmental Consultant

Name of the Person Requesting Approval (printed)

Title/Association

Dustin Stahl Digitally signed by Dustin Stahl
Date: 2019.02.15 15:33:24 -09'00'

08/23/2018

(907) 374-3226

Signature

Date

Phone Number

-----DEC USE ONLY-----

Based on the information provided, ADEC approves transport of the above mentioned material for treatment in accordance with the approved facility operations plan. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight receipts of the loads transported to the facility and a post treatment analytical report. The contaminated soil shall be transported as a covered load in compliance with 18 AAC 60.015.

Shawn Tisdell

Environmental Program Specialist

DEC Project Manager Name (printed)

Project Manager Title

Shawn Tisdell Digitally signed by Shawn Tisdell
Date: 2018.08.23 13:38:35 -08'00'

Aug 23, 2018

907-451-2752

Signature

Date

Phone Number



P.O. Box 55878, NORTH POLE, AK 99705 • (907) 488-4899 • FAX (907) 488-4823

CERTIFICATION OF RCRA EXEMPT STATUS

CLIENT NAME: ARES

CONTRACT NAME: _____

CONTRACT NUMBER: _____ DATE: 08/23/2018

CONSULTANT ADVISOR: Lyle Gresehover ARES

Client, (and if signed by Consultant Advisor, Consultant Advisor), hereby certifies that material presented to OIT, Inc. for treatment under the above referenced contract and any subsequent contract is RCRA (Resource Conservation and Recovery Act) exempt waste, and does not meet the definition of hazardous waste under the applicable code of Federal and State Regulations.

Client, (and if signed by Consultant Advisor, Consultant Advisor on behalf of client), further agree to indemnify OIT, Inc. for any liability that may be incurred as a result of the material presented for treatment being classified as a RCRA hazardous material, including but not limited to indemnification for cost of proper disposal and any fines or penalties imposed by any local, State, or Federal agencies.

Signed by client and/or client's consultant.

Lyle Gresehover

CLIENT REPRESENTATIVE NAME

SIGNED BY CLIENT'S REPRESENTATIVE

Project Manager/Geologist

TITLE

PO box 80662 Fairbanks AK 99708

ADDRESS

907-374-3226

PHONE NUMBER

8/23/2018

DATE

CONSULTANT ADVISOR NAME

SIGNED BY CONSULTANT FIRM REP.

TITLE

ADDRESS

PHONE NUMBER

DATE



P.O. Box 55878, North Pole, AK 99705 • (907) 488-4899 • FAX (907) 488-4823

WASTE ANALYSIS FORM

In accordance with OIT's QA/QC Management Acceptance Plan, prior to acceptance of any hydrocarbon contaminated materials, laboratory documents identifying the contaminated materials and analytical test results need to be submitted to OIT. These documents should show ADEC established procedures and include but not be limited to:

- The name of the testing laboratory and responsible person
- Analytical procedures
- Sampling procedures
- Quality assurance procedures
- Data reporting (analytical results and levels)
- Specific information on site history

Please attach all available test information to this form.

CLIENT / CONSULTANT / CONTRACTOR	EPA ID# _____
NAME: ARES	_____
ADDRESS: PO box 80662	_____
CITY: Fairbanks	STATE: AK ZIP: 99708
CONTACT PERSON: Dustin Stahl	EMERGENCY PHONE #: 907-374-3226

WASTE HAULER (IF APPLICABLE)	EPA ID# _____
NAME: ARES	_____
ADDRESS: PO box 80662	_____
CITY: Fairbanks	STATE: AK ZIP: 99708
CONTACT PERSON: Dustin Stahl	EMERGENCY PHONE #: 907-374-3226

VOLUME OF WASTE MATERIAL & CONTAINMENT

1

GALLONS

TONS

DRUMS

OTHER

GENERAL DESCRIPTION OF WASTE

Date of Spill (or date generated): IDW-Purge Water-groundwater sampling-Fuel release

Location of material: ARES office-warm storage

Source of contamination: IDW-Purge Water-groundwater sampling-Fuel release

(U.S.T, Surface spill, Daily Maintenance, etc.)

Type of Material: Purge water

(Gravel, sand, silt, absorbents, shop rags, floor dry, etc.) (If soil, please estimate percentage of fines)

ADEC approval for removal and transportation of soils related to an ADEC approved cleanup plan, or a site overseen by ADEC spill response program (Y/N)?

Does the material contain or is it mixed with a listed hazardous waste (Y/N)?

(As described in 40 CFR 261 Subpart D [40 CFR 261.31, 261.32, 261.33])

If claiming a specific RCRA exemption, e.g. UST generated soils, please site exemption:

Known Source-Groundwater monitoring of Fuel Releases

History of Contaminated materials:

Known Source-Groundwater monitoring of Fuel Releases (Analytical results on file at ARES)

Comments:

TEST RESULTS (CHECK): IF YES PLEASE ATTACH TEST RESULTS

DRO

RCRA METALS

GRO

SVOC

RRO

VOC

BTEX
OTHER

I hereby certify that all information submitted in this and all attached documents are complete, accurate, and discloses all known or suspected hazards. I acknowledge that if material in fact varies from the information provided herein, additional charges for testing, handling, treatment or other devices may be imposed.

Authorized Signature

Geologist

Title

8/23/2018

Date

CERTIFICATE OF WEIGHT

Contracting Capabilities for Organic Incineration Technologies



OIT, Inc.

P.O. Box 55878
North Pole, Alaska 99705
(907)488-4899 Fax(907)488-4823

16005

Shipper ARES Contract SW18-045 ARES
 Carrier " Commodity Purge Water
 W/B No. _____ Truck No. LIC. # 382
 Origin _____ Destination OIL
 Driver ON OFF

3:21P 8-23-18

000 10

30271 CH

8200 LB

8200

3:26P 8-23-18

000 10

30272 CH

7860 LB

7860

Driver's Signature: [Signature]

Public Scale Certified and Inspected by Alaska Department of Commerce, Division of Weights & Measures

PURGE WATER
 FROM :
 - 536 4th AVE
 - KOBUCK FEED+FUEL
 - BSL 205 RICH