Site Characterization
Shishmaref Native Store
Shishmaref, Alaska

ADEC File No. 530.38.006

February 2019

Submitted To:
Native Village of Shishmaref
c/o ANICA, Inc.
4025 Delridge Way SW, Suite 300
Seattle, WA 98106

By:
Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
Phone: 907-561-2120
Fax: 907-561-4483

32-1-20017

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska Method
ANTHC	Alaska Native Tribal Health Consortium
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CSM	Conceptual Site Model
DQOs	Data Quality Objectives
DRO	Diesel Range Organics
EPA	Environmental Protection Agency
GRO	Gasoline Range Organics
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
mg/kg	Milligrams Per Kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
PAHs	Polynuclear Aromatic Hydrocarbons
PID	Photoionization Detector
ppm	Parts Per Million
RPD	Relative Percent Difference
SGS	SGS North America, Inc.
SIM	Selective Ion Method
USCG	United States Coast Guard
VOCs	Volatile Organic Compounds

SITE CHARACTERIZATION
SHISHMAREF NATIVE STORE
SHISHMAREF, ALASKA
ADEC FILE NO. 530.38.006

1.0 INTRODUCTION

This report presents the results of our site characterization activities conducted at the Shishmaref Native Store in Shishmaref, Alaska. The site is listed on the Alaska Department of Environmental Conservation (ADEC) contaminated database as File No. 530.38.006. The project was conducted in general accordance, except as noted in Section 3.2 of this report, with our June 8, 2018 revised work plan which was approved by Ms. Erica Blake of the ADEC in a letter dated July 6, 2018.

2.0 BACKGROUND

In May 2014, the City of Shishmaref reported to the ADEC and the U.S. Coast Guard (USCG) that a sheen was present along the north shoreline of Shishmaref near the Shishmaref Native Store. The USCG undertook spill response activities, including placing absorbent boom along the beach, in June 2014. After the sheen was reported again in December 2014, the USCG conducted additional spill response and cleanup activities. At this time the USCG located a potential source area at the marine header north of the Shishmaref Native Store. Analytical samples collected from seawater by the USCG identified gasoline and diesel. In 2015, the fuel lines at the marine header were hydrostatically tested and confirmed that the gasoline line was leaking. In 2016, the piping was repaired and passed a hydrostatic inspection.

In 2016, surface soil screening samples were collected in the vicinity of the marine header piping. Based on field screening samples and visual and olfactory observations, surface soil contamination was present near the marine header and a fuel dispenser. One test pit was advanced to approximately 7 feet below ground surface (bgs) approximately 20 feet southwest of the marine header. Field screening samples were collected to the bottom of the test pit and showed that contamination extended to the bottom of the test pit. Permafrost was encountered at the base of the test pit and the contamination appeared to spread horizontally at this depth.

According to the ADEC's contaminated sites database, the ADEC is also concerned that releases may have occurred from the on-site diesel and gasoline fuel dispensers.

In a compliance letter dated July 5, 2017, Ms. Erica Blake of the ADEC requested that:

- Soil samples be collected from surface and subsurface soil near the marine header and the fuel dispenser, in an attempt to evaluate the vertical and horizontal extent of contamination;

- Groundwater samples be collected from test wells, to evaluate whether groundwater has been impacted by the documented release; and

- Vapor intrusion pathways be evaluated to assess the potential for fuel odors within nearby buildings.

The purpose of this project is to address the ADEC request and the objectives is to delineate the extent of soil contamination.

3.0 FIELD ACTIVITIES

The project consisted of advancing test pits, collecting field screening and analytical soil samples, and conducting indoor air quality building surveys. Test pit locations are shown on Figure 2. Prior to advancing the test pits, the Native Village of Shishmaref and the local utilities were contacted to mark buried utilities within the project area. Shannon & Wilson provided a Qualified Environmental Professional to collect field screening readings and analytical soil samples. Alaska Native Tribal Health Consortium (ANTHC) provided the equipment and personnel to advance the test pits. SGS North America, Inc. (SGS) of Anchorage, Alaska conducted the analytical testing of the project samples. Field notes are provided in Appendix A. Site photographs are included in Appendix B.

3.1 Site Conditions

The site consists of two buildings, the Shishmaref Native Store and a Warehouse. A paved road extends between the two structures. Several smaller buildings, owned by others, are located adjacent to the Shishmaref Native Store and Warehouse. A guard rail along the north side of the road inhibits motorized access to the area west of the Warehouse. The ground surface is generally flat, consists of sand, and sparsely covered in vegetation. The northern edge of the property, where it meets the Chukchi Sea, is lined with a riprap revetment used as erosion control (Photo 2). Low-hanging overhead utilities extend from the Shishmaref Native Store, the Warehouse, and other nearby buildings (Photo 3). The site is located on a localized high point with an elevation of approximately 16 feet above mean sea level, per the *Shishmaref Community Map* published by the Alaska Department of Commerce, Community and Economic Development.

A marine header and a fuel dispenser were formerly located at the site. The marine header was connected to a fuel tank farm, approximately 300 feet south of the site, via aboveground and buried piping. The tank farm houses aboveground storage tanks that contain diesel, gasoline, and heating fuel. The tank farm supplied gasoline and diesel to the dispenser formerly located at the Shishmaref Native Store via aboveground and buried piping. Both the marine header and the fuel dispenser have been removed and relocated offsite. Piping associated with the previous marine header and fuel dispenser has been removed and cutoff at the ground surface. It appears the buried portions of the piping remains in-place (Photo 1). The tank farm remains in-place and was not evaluated as part of this project.

3.2 Scope Modifications

The following changes to the scope presented in the Work Plan were implemented due to conditions encountered in the field:

- Location of the test pits as proposed in the Work Plan were modified due to safety concerns associated with overhead utilities and access restrictions. Of the proposed six test pit locations, only two were accessible with an excavator. The remaining test pits were hand dug and limited in depth.

- Suprapermafrost water was not encountered in the test pits. Therefore, monitoring wells were not installed and groundwater samples were not collected.

3.3 Indoor Air Quality Building Survey

An ADEC Building Inventory and Indoor Air Sampling Questionnaire, which can be found in the *Vapor Intrusion Guidance for Contaminated Sites* (ADEC, January 2017), was completed for the Warehouse and the Shishmaref Native Store structures. Completed copies of the questionnaires are provided in Appendix C. Results from the indoor air quality building survey are summarized below.

The Warehouse has a subgrade cellar, constructed of wood, that extends approximately 6 feet below grade (Photo 8). At the time of our site visit, a potential fuel odor was observed inside the building, although the source was not identified. There were several items stored in the building that may have contributed to the odor, including quarts of motor oil, and an all-terrain vehicle. Per the ADEC 2017 Conceptual Site Model (CSM) Guidance the indoor air exposure pathway for the Warehouse should be considered complete as it is within 30 feet of petroleum contaminated soil. While the indoor air exposure pathway is potentially complete there are currently limited receptors, as the building is locked and only visited by Shishmaref Native Store employees on an irregular basis.

The Shishmaref Native Store is constructed on pilings with a partially enclosed air space (Photo 9). While indoor air inhalation is not typically a complete pathway for buildings on pilings, per the ADEC 2017 CSM Guidance, the skirting surrounding the Shishmaref Native Store may allow vapors to accumulate. Therefore, the indoor air exposure pathway is potentially complete due to the structure being located within 30 feet of petroleum contaminated soil.

3.4 Test Pits

Seven test pits, identified as Test Pits TP1 through TP7, were advanced on September 26, 2018. Test Pits TP1 and TP2, were dug using an excavator to depths of 10 and 11 feet below ground surface (bgs), respectively (Photo 4). Due to inaccessibility caused by overhead utilities and the guard rail along the road Test Pits TP3 through TP7 were dug using hand tools and varied in depth from 4 to 6 feet bgs (Photos 5, 6, and 7, respectively). Locations of test pits were further constricted by the revetment north of the Warehouse. Groundwater was not encountered in the test pits. Permafrost was encountered in TP2 at a depth of approximately 11 feet bgs. The horizontal position of the test pits/temporary wells were recorded using swing tie measurements to site features.

In general, field screening and analytical samples were collected at approximately 2-foot intervals from the test pits. For test pits completed using the excavator analytical sample jars for volatile analyses were collected first, followed by the field screening sample, and finally the non-volatile analytical sample jars. Hand dug test pits were first screened then upon reviewing the screening results analytical samples were collected from same location as the corresponding screening sample. Each soil sample was visually described and "screened" for volatile organic compounds (VOCs) using a photoionization detector (PID) and ADEC-approved headspace screening techniques. The field screening samples were collected in re-sealable plastic bags, warmed to at least 40 degrees Fahrenheit, and tested within 60 minutes of collection. To screen, the sample was agitated for about 15 seconds, the seal of the bag will be opened slightly, the instrument probe will be inserted into the air space above the soil, and the bag held closed around the probe. The maximum ionization response as the PID draws vapor from the sample bag was recorded. The PID was calibrated with 100 parts per million (ppm) isobutylene in air standard gas.

With the exception of Test Pits TP3 and TP4, two analytical soil samples were collected from each test pit and submitted for laboratory analysis. Analytical samples were collected by quickly and completely filling laboratory-provided glass jars in decreasing order of volatility. For each volatile sample, at least 25 grams of soil, but no more than what can be completely submerged with 25-milliliters of methanol, was placed into a pre-weighed, 4-ounce jar with a septa lid. A 25-milliliter aliquot of methanol containing laboratory-added surrogates was added to the sample jar to submerge the soil sample. For each non-volatile sample, the laboratory-supplied jar was

completely filled with soil, taking care to exclude gravel and debris. Sample jars were filled using dedicated stainless-steel spoons, placed in coolers with ice packs, and transferred to the laboratory using chain of custody procedures.

3.5 Surface Soil Sampling

During the excavation of test pit TP5 it was observed that the first 6 inches of soil exhibited staining and petroleum hydrocarbon odors. In an effort to delineate surface contamination, three surface soil locations were screened in the area north of the Warehouse, as shown on Figure 2. The screening samples were collected at depths of approximately 0.5 feet bgs. One analytical sample was collected from the screening location with the highest PID measurement. Screening and analytical sample was performed as described in Section 3.4.

4.0 LABORATORY ANALYSIS

A total of 15 soil samples, including two duplicate samples, were collected and submitted to SGS for laboratory analysis. The samples were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101; benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B; and diesel range organics (DRO) by AK 102. Samples TP3-2/TP3-29, TP6-3, and TP7-3 were also tested for polynuclear aromatics hydrocarbons (PAHs) by EPA Method 8270D selective ion method (SIM) and VOCs by EPA Method 8260C, in lieu of BTEX. One soil methanol trip blank was analyzed for GRO/BTEX by AK 101/EPA Method 8021B

5.0 SUBSURFACE CONDITIONS

Based on our observations of soil recovered from the test pits and surface screening samples, soil at the site generally consists of a brown well graded sand. Permafrost was encountered in Test Pit 2 at a depth of 11 feet bgs. Groundwater was not encountered the test pits. Petroleum odors were noted in the soil samples recovered from Test Pits TP1, TP2, TP3, TP5, TP6, and TP7. Wood and metal debris were encountered in Test Pit TP5.

ADEC requested documentation of the horizontal distance to nearby wells, surface water and water supply intakes. Shannon and Wilson confirmed that the Village of Shishmaref pumps their drinking water from a man-made pond located approximately 2,900 feet east of the site. The source of water in the pond is primarily snowmelt. With the exception of the Chukchi Sea, which bounds the site to the north, surface water bodies were not observed.

6.0 DISCUSSION OF ANALYTICAL RESULTS

The analytical soil results were compared to the most stringent ADEC Method Two cleanup levels listed in Table B1 and B2 of 18 Alaska Administrative Code (AAC) 75.341, for the "Artic Zone" (October 27, 2018). According to the Institute of Northern Engineering at the University of the Fairbanks *Permafrost Characteristics of Alaska* the Kotzebue Sound region, including Shishmaref, is underlain by continuous permafrost. This is consistent with the observations made during the investigation. Therefore, it is our opinion that the Arctic Zone cleanup levels apply to the site. The applicable cleanup and regulatory levels are listed in Table 2. The laboratory reports and completed ADEC Laboratory Data Review Checklists are provided in Appendix D.

6.1 Soil Samples

GRO was detected in Sample TP6-3 at a concentration of 1,820 milligram per kilogram (mg/kg) which exceeds the ADEC Method Two Arctic Zone cleanup levels of 1,400 mg/kg. Of the four samples analyzed for VOCs (Samples TP6-3, TP7-3, and duplicate pair TP3-3/TP3-29), each was found to contain xylenes (maximum concentration of 576 mg/kg), and 1,2,4-trimethylbenzene (maximum concentration of 168 mg/kg) at concentrations exceeding the applicable cleanup levels of 57 mg/kg and 43 mg/kg, respectively. Additionally, the concentrations of 1,3,5-trimethylbenzene in Samples TP3-2 (37.3 mg/kg) and TP7-3 (61.1 mg/kg) exceed the ADEC cleanup level of 37 mg/kg. The remaining soil samples did not contain concentrations of the tested analytes in excess of the applicable cleanup levels.

6.2 Quality Assurance/Quality Control

The project laboratory follows on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory quality controls for this project included surrogates, method blanks, laboratory control sample/laboratory control sample duplicates (LCS/LCSD), and matrix spike/matrix spike (MS/MSD) duplicates. If a DQO for one of the controls is not met, the laboratory provides a brief explanation in the case narrative of their report.

External quality controls include field records, one trip blank, and two field duplicate sample sets. Field logs and records were checked for completeness and accuracy. The relative percent difference (RPD) between the project sample and associated duplicate results is a measure of precision affected by matrix heterogeneity, sampling technique, and laboratory analyses. All project RPDs are less than the ADEC's DQO of 50 percent for soil.

A laboratory-prepared trip blank samples accompanied the project sample jars from the laboratory to the site during sampling activities and back again to SGS. The soil trip blanks did not contain detectable concentrations of GRO, or VOCs. These results suggest that the project soil samples were not cross-contaminated during sampling, shipping, or analysis of the samples.

Shannon & Wilson conducted a limited data assessment to review the laboratory's compliance with precision, accuracy, sensitivity, and completeness to the data quality objectives. Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist, which is included in Appendix D. In our opinion, no non-conformances that would adversely impact data usability for the objectives of this project were noted.

7.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) was prepared to identify known and potential exposure pathways associated with contamination at the site. The CSM was developed in general accordance with the ADEC's *Guidance on Developing Conceptual Site Models* (October 2017), using the ADEC's CSM Human Health Graphic and Scoping Forms. Copies of the completed forms are included in Appendix E, with discussions of the potential exposure pathways provided below. The narrative includes descriptions of the site-specific considerations that increase or decrease the viability of each pathway at this site.

7.1 Soil

The direct contact exposure route is considered complete due to the presence of petroleum-impacted soil between 0 and 15 feet bgs. The direct contact exposure pathway is potentially complete for site visitors and trespassers, commercial workers, construction workers, and subsistence harvesters. Dermal absorption of contaminates is also complete due to the presence of acenaphthene, anthracene, benzo[b]fluoranthene, chrysene, fluoranthene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. With the exception of 1-methylnaphthalene and naphthalene, the PAH concentrations are less than 1/10th the cleanup level and therefore exposure may be considered insignificant for these compounds.

7.2 Outdoor Air

Volatile contaminants have the potential to impact receptors through outdoor and indoor air inhalation. The presence of volatile contaminant concentrations in soil within the top 15 feet bgs creates a potentially complete outdoor air exposure pathway for site visitors and trespassers, commercial workers, construction workers, and subsistence harvesters.

7.3 Indoor Air

The ADEC has not established soil cleanup levels for the indoor air inhalation pathway. Volatile contaminants have the potential to impact receptors through indoor air inhalation. To further evaluate this exposure pathway an indoor air quality building survey was performed, as discussed in Section 3.3. Receptors of the indoor air pathway within the Warehouse and Shishmaref Native Store are limited to current and future commercial workers, and visitors. Future construction workers are also a potential receptor.

7.4 Surface Water

In 2014, a sheen was observed on the shoreline adjacent to the site. The surface water body consists of salt water; therefore, the water is non-potable and the surface water exposure pathway is considered incomplete.

7.5 Sediment

Contaminants listed in Appendix B of the CSM Guidance document (dermal exposure) have been documented in soil at the site. The potential exists for contaminants to be transported and deposited as sediment along the shoreline. Potential receptors for this pathway include current and future site visitors and/or subsistence harvesters.

7.6 Biota

Based on the site's close proximity to the Chukchi Sea and the presence of bioaccumulative contaminants, per Appendix C of the CSM Guidance document, there is a potential that contaminants could be absorbed by plants and/or animals within the ocean's ecosystem. Therefore, biota is considered a potential complete exposure pathway. Potential receptors for this pathway include current and future site recreation users/visitors and/or subsistence harvesters and consumers.

7.7 CSM Summary

Currently complete or potentially complete exposure pathways, including direct contact with soil, inhalation of outdoor and indoor air, sediment, and biota have been identified at the site. It is also recognized that changes in the site use or other site conditions may affect the viability of potential exposure pathways. In particular, the CSM will need to be re-evaluated and revised as necessary if demolition occurs at the site and/or a change in land use occurs.

8.0 CONCLUSIONS

The field activities included advancing seven test pits, five by hand and two with an excavator, the collection of surface screening samples, and conducting indoor air quality building surveys. A total of 15 analytical soil samples were collected from the test pits and surface screening locations. Soil samples exceeding the ADEC Method Two cleanup levels for GRO, xylenes, 1,2,4-trimethylbenzene, and/or 1,3,5-trimethylbenzene were documented at the locations of the former marine header (Test Pits TP3 and TP6) and the former dispenser (Test Pit TP7). The lateral and vertical extent of soil contamination is not fully defined at either location. Although, soil samples collected southwest of the former dispenser, and east and west of the former marine header did not contain contaminant concentrations exceeds ADEC cleanup levels. The indoor air exposure pathway is potential complete for the Warehouse and the Shishmaref Native Store due to their proximity, less than 30 feet, to petroleum impact soils.

9.0 CLOSURE/LIMITATIONS

This report was prepared for the exclusive use of our client and their representatives. The findings we have presented within this report are based on the limited sampling and analyses we conducted for this project. As a result, the analyses and sampling performed can only provide you with our professional judgment as to the environmental characteristics of this site, and in no way guarantee that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes due to natural forces or human activity can occur on the site. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

Shannon & Wilson has prepared the attachment in Appendix F, “Important Information About Your Geotechnical/Environmental Report,” to assist you in understanding the use and limitations of our reports.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study except upon your authorization or as required by law.

We appreciate this opportunity to be of service and your confidence in our firm. If you have questions or comments concerning this report, please call the undersigned at (907) 561-2120.

SHANNON & WILSON, INC.

Dan P. McMahon
Senior Associate

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet**)	Headspace (ppm) ^	Sample Description
Surface Samples					
* SS1	9/26/2018	Area north of Warehouse	0.5	11.1	*Brown, well graded sand (SW); moist; slight petroleum odor*
SS2	9/26/2018	Area north of Warehouse	0.5	3.0	*Brown, well graded sand (SW); moist; slight petroleum odor*
SS3	9/26/2018	Area north of Warehouse	0.5	0.0	*Brown, well graded sand (SW); moist; slight petroleum odor*
Test Pit TP1					
TP1-1	9/26/2018	Adjacent to the former fuel dispenser location	2.0	0.0	*Brown, well graded sand (SW); moist*
TP1-2	9/26/2018	Adjacent to the former fuel dispenser location	4.0	0.0	*Brown, well graded sand (SW); moist*
TP1-3	9/26/2018	Adjacent to the former fuel dispenser location	6.0	0.0	*Brown, well graded sand (SW); moist*
* TP1-4	9/26/2018	Adjacent to the former fuel dispenser location	8.0	72	*Brown, well graded sand (SW); moist; petroleum odor*
* TP1-5	9/26/2018	Adjacent to the former fuel dispenser location	10.0	214	*Brown, well graded sand (SW); moist; petroleum odor*
Test Pit TP2					
TP2-1	9/26/2018	East of Warehouse	2.0	0.0	*Brown, well graded sand (SW); moist*
TP2-2	9/26/2018	East of Warehouse	4.0	12.6	*Brown, well graded sand (SW); moist; diesel odor*
* TP2-3	9/26/2018	East of Warehouse	6.0	260	*Brown, well graded sand (SW); moist; diesel odor*
* TP2-39	9/26/2018	Duplicate of Sample TP2-3	6.0	260	*Brown, well graded sand (SW); moist; diesel odor*
TP2-4	9/26/2018	East of Warehouse	8.0	180	*Brown, well graded sand (SW); moist; diesel odor*
TP2-5	9/26/2018	East of Warehouse	10.0	169	*Brown, well graded sand (SW); moist; diesel odor*
* TP2-6	9/26/2018	East of Warehouse	11.0	52	*Brown, well graded sand (SW); moist and frozen; petroleum odor*
Test Pit TP3					
TP3-1	9/26/2018	Northwest of former marine header location	3.0	305	*Brown, well graded sand (SW); moist; gasoline odor*
* TP3-2	9/26/2018	Northwest of former marine header location	5.5	417	*Brown, well graded sand (SW); moist; gasoline odor*
* TP3-29	9/26/2018	Duplicate of Sample TP3-29	5.5	417	*Brown, well graded sand (SW); moist; gasoline odor*
Test Pit TP4					
TP4-1	9/26/2018	West of former marine header location	0.5	0.0	*Brown, well graded sand (SW); moist*
TP4-2	9/26/2018	West of former marine header location	2.0	0.0	*Brown, well graded sand (SW); moist*
TP4-3	9/26/2018	West of former marine header location	4.0	0.0	*Brown, well graded sand (SW); moist*
* TP4-4	9/26/2018	West of former marine header location	6.0	0.0	*Brown, well graded sand (SW); moist*
Test Pit TP5					
TP5-1	9/26/2018	North of Warehouse	0.5	24.3	*Brown, well graded sand (SW); moist; slight petroleum odor*
* TP5-2	9/26/2018	North of Warehouse	2.0	101	*Brown, well graded sand (SW); moist; slight petroleum odor*
* TP5-3	9/26/2018	North of Warehouse	4.0	74	*Brown, well graded sand (SW); moist; slight petroleum odor*

Notes:

* = Sample analyzed by the project laboratory (See Table 2 and Appendix C)

** = Feet below ground surface

^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID)

ppm = Parts per million

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet**)	Headspace (ppm) ^	Sample Description
Test Pit TP6					
* TP6-1	9/26/2018	Former marine header location	0.5	263	*Brown, well graded sand (SW); moist; strong petroleum odor*
TP6-2	9/26/2018	Former marine header location	2.0	289	*Brown, well graded sand (SW); moist; strong petroleum odor*
* TP6-3	9/26/2018	Former marine header location	4.0	284	*Brown, well graded sand (SW); moist; strong petroleum odor*
Test Pit TP7					
* TP7-1	9/26/2018	Former fuel dispenser location	0.5	117	*Brown, well graded sand (SW); moist*
TP7-2	9/26/2018	Former fuel dispenser location	2.0	250	*Brown, well graded sand (SW); moist*
* TP7-3	9/26/2018	Former fuel dispenser location	4.0	552	*Brown, well graded sand (SW); moist*
Quality Control					
* Trip Blank 01	9/26/2018	Trip Blank	-	-	*Ottawa sand with methanol added in the laboratory*

Notes:

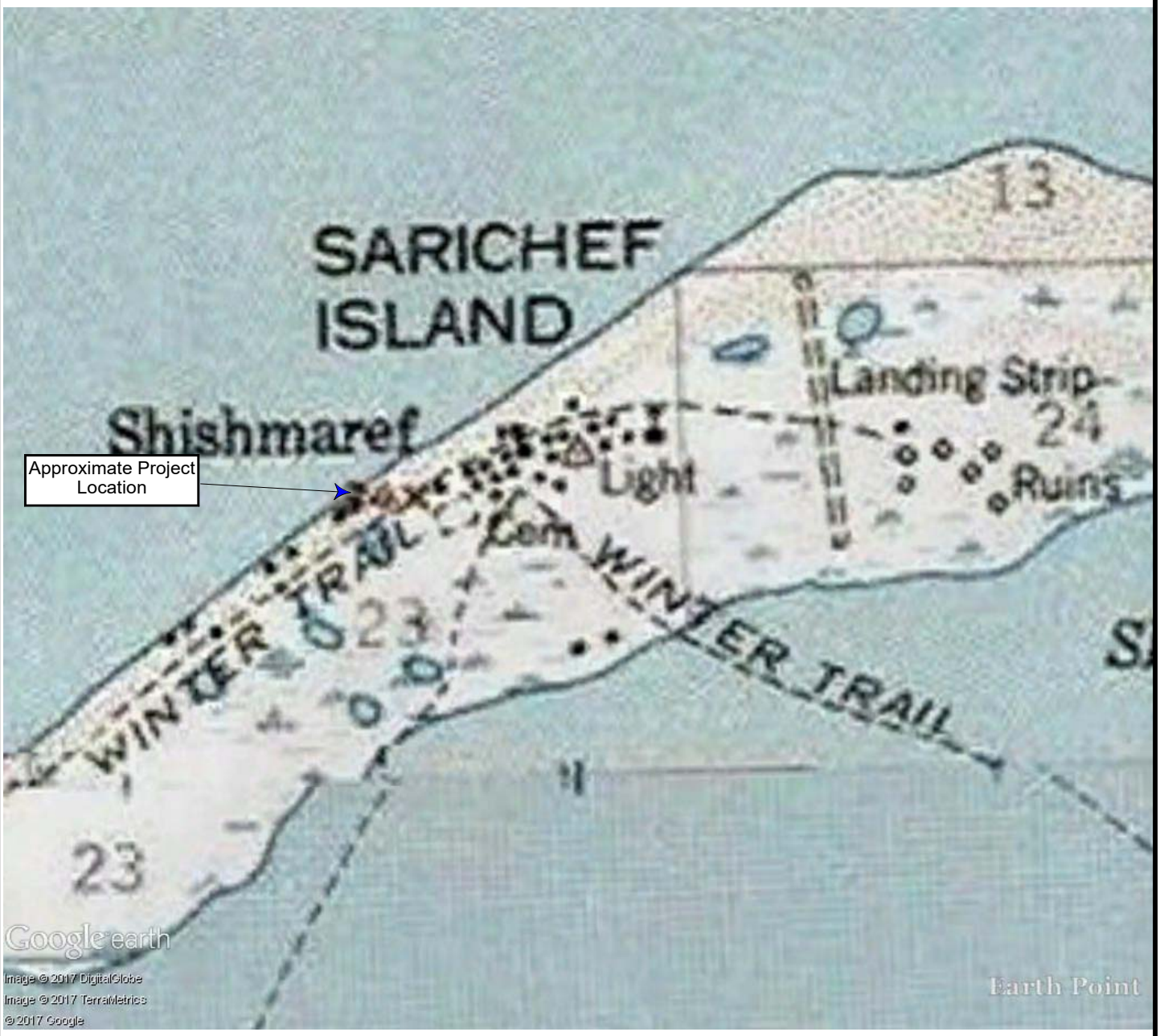
* = Sample analyzed by the project laboratory (See Table 2 and Appendix C)
** = Feet below ground surface
^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID)
ppm = Parts per million
- = Measurement not applicable

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Units	Method*	Cleanup Level (mg/kg)**	Sample ID Number and Collection Depth in Feet bgs (See Table 1 and Figure 2)														
				Surface Sample	Test Pit Samples													Trip Blank
				SS1	TP1-4	TP1-5	TP2-3	TP2-39~	TP2-6	TP3-2	TP3-29~	TP4-4	TP5-2	TP5-3	TP6-1	TP6-3	TP7-1	TP7-3	Trip Blank 01
				0.5	8.0	10.0	6.0	6.0	11.0	5.5	5.5	6.0	2.0	4.0	0.5	4.0	0.5	4.0	-
PID Headspace Reading	ppm	580B OVM	-	11.1	72	214	260	260	52	305	417	0.0	101	74	263	284	117	552	-
Gasoline Range Organics (GRO)	mg/kg	AK 101	1,400	<1.23	**33.8 J+**	**122 J+**	**227 J+**	**188 J+**	**8.96**	**1,140 J+**	**861 J+**	<0.830	**59.2 J+**	**2.57**	**76.3 J+**	**1,820 J+**	**34.2 J+**	**654 J+**	<1.25
Diesel Range Organics (DRO)	mg/kg	AK 102	12,500	**2,520**	**1,530**	**407**	**2,040**	**2,200**	**432**	**1,580**	**1,630**	<10.4	**3,710**	**842**	**5,230**	**1,020**	**4,020**	**3,580**	-
Volatile Organic Compounds (VOCs)																			
Benzene	mg/kg	EPA 8021B/8260C	16	<0.00615	<0.00600	<0.00505	**0.00659 J**	**0.00580 J**	**0.00749 J**	**0.362**	**0.227**	<0.00415	**0.00577 J**	**0.00541 J**	**0.383**	**0.674**	<0.00560	<0.117	<0.00625
Toluene	mg/kg	EPA 8021B/8260C	200	<0.0123	<0.0120	<0.0101	**0.0341**	**0.0316**	**0.0206 J**	**28.8**	**19.8**	<0.00830	**0.0398**	**0.0487**	**0.0526**	**72.5**	**0.00986 J**	**3.95**	<0.0125
Ethylbenzene	mg/kg	EPA 8021B/8260C	72	<0.0123	**0.326**	<0.0831	**0.235**	**0.176**	**0.00707 J**	**2.58**	**1.83**	<0.00830	**0.0135 J**	<0.0109	**0.0243**	**4.96**	**0.043**	**1.69**	<0.0125
Xylenes	mg/kg	EPA 8021B/8260C	57	**0.00958 J**	**1**	**5.31**	**4.45**	**3.87**	**0.226**	**269**	**194**	<0.0249	**0.382**	**0.0645 J**	**0.414**	**576**	**1.28**	**194**	<0.0375
1,2,4-Trimethylbenzene	mg/kg	EPA 8260C	43	-	-	-	-	-	-	**115**	**87.3**	-	-	-	-	**168**	-	**104**	-
1,3,5-Trimethylbenzene	mg/kg	EPA 8260C	37	-	-	-	-	-	-	**37.3**	**30.2**	-	-	-	-	**35.7**	-	**61.1**	-
4-Isopropyltoluene	mg/kg	EPA 8260C	-	-	-	-	-	-	-	**4.94**	**3.86**	-	-	-	-	**3.06**	-	**5.28**	-
Isopropylbenzene (Cumene)	mg/kg	EPA 8260C	54	-	-	-	-	-	-	**0.738**	**0.54**	-	-	-	-	**2.32**	-	**0.366J**	-
Naphthalene	mg/kg	EPA 8260C	42	-	-	-	-	-	-	**4.86**	**3.57**	-	-	-	-	**4.95**	-	**8.48**	-
n-Propylbenzene	mg/kg	EPA 8260C	52	-	-	-	-	-	-	**1.01**	**0.75**	-	-	-	-	**4.64**	-	**0.439J**	-
sec-Butylbenzene	mg/kg	EPA 8260C	28	-	-	-	-	-	-	**0.697**	**0.495**	-	-	-	-	**0.934**	-	**0.318J**	-
trans-1,2-Dichloroethene	mg/kg	EPA 8260C	960	-	-	-	-	-	-	**0.344 J**	<0.221	-	-	-	-	<0.223	-	<0.224	
Other VOCs	mg/kg	EPA 8260C	various	-	-	-	-	-	-	ND	ND	-	-	-	-	ND	-	ND	-
Polynuclear Aromatic Hydrocarbons (PAHs)																			
1-Methylnaphthalene	mg/kg	EPA 8270D-SIM	68	-	-	-	-	-	-	**5.87**	**4.55**	-	-	-	-	**1.5**	-	**10.4 J-**	-
2-Methylnaphthalene	mg/kg	EPA 8270D-SIM	420	-	-	-	-	-	-	**5.08**	**4.18**	-	-	-	-	**2.98**	-	**14 J-**	-
Acenaphthene	mg/kg	EPA 8270D-SIM	6,300			-	-	-	-	<0.258	**0.0801**	-	-	-	-	<0.0129	-	**0.151 J-**	-
Anthracene	mg/kg	EPA 8270D-SIM	31,000	-	-	-	-	-	-	<0.258	<0.0127	-	-	-	-	<0.0129	-	**0.0233 J-**	-
Benzo[b]fluoranthene	mg/kg	EPA 8270D-SIM	20	-	-	-	-	-	-	<0.0129	<0.0127	-	-	-	-	**0.00774 J**	-	<0.0135	-
Chrysene	mg/kg	EPA 8270D-SIM	2,000	-	-	-	-	-	-	<0.0129	<0.0127	-	-	-	-	<0.0129	-	**0.00801 J-**	-
Fluorene	mg/kg	EPA 8270D-SIM	4,200	-	-	-	-	-	-	**0.259 J**	**0.182**	-	-	-	-	**0.0974**	-	**0.299 J-**	-
Fluoranthene	mg/kg	EPA 8270D-SIM	4,200	-	-	-	-	-	-	**0.0134 J**	**0.0110 J**	-	-	-	-	**0.0139J**	-	**0.0281 J-**	-
Naphthalene	mg/kg	EPA 8270D-SIM	42	-	-	-	-	-	-	**3.18**	**2.74**	-	-	-	-	**4.32**	-	**7.07 J-**	-
Phenanthrene	mg/kg	EPA 8270D-SIM	3,100	-	-	-	-	-	-	<0.258	**0.132**	-	-	-	-	**0.0924**	-	**0.194 J-**	-
Pyrene	mg/kg	EPA 8270D-SIM	3,100	-	-	-	-	-	-	**0.0182 J**	**0.0157 J**	-	-	-	-	**0.0187J**	-	**0.0264 J-**	-
Other PAHs	mg/kg	EPA 8270D-SIM	various	-	-	-	-	-	-	ND	ND	-	-	-	-	ND	-	ND	-

Notes:

*	= See Appendix C for compounds tested, methods, and laboratory reporting limits.
**	= Soil cleanup level is the most stringent Method Two standard listed in Table B1 or B2, 18 AAC 75, for the "Arctic Zone" (October 2018)
mg/kg	= Milligrams per kilogram
bgs	= Below ground surface
~	= Duplicate of preceding sample
-	= Not tested or not applicable
<0.00615	= Analyte not detected; laboratory limit of detection is 1.03 mg/kg
2,520	= Analyte detected at a concentration less than the applicable ADEC cleanup level
576	= Exceeds the applicable ADEC cleanup level
J	= Estimated concentration less than the limit of quantitation. See the SGS laboratory report for details.
J+	= Laboratory result is potentially biased high due to surrogate failure. See the ADEC Laboratory Data Review Checklist (LDRC) for details.
J-	= Laboratory result is potentially biased low due to surrogate failure. See the ADEC Laboratory Data Review Checklist (LDRC) for details.
ND	= Analyte not detected at or above the laboratory's limit of detection.



Map adapted from aerial imagery provided by Google Earth Pro(tm), reproduced with permission granted by Google Earth Mapping Services.

0 1000 2000
APPROXIMATE SCALE IN FEET

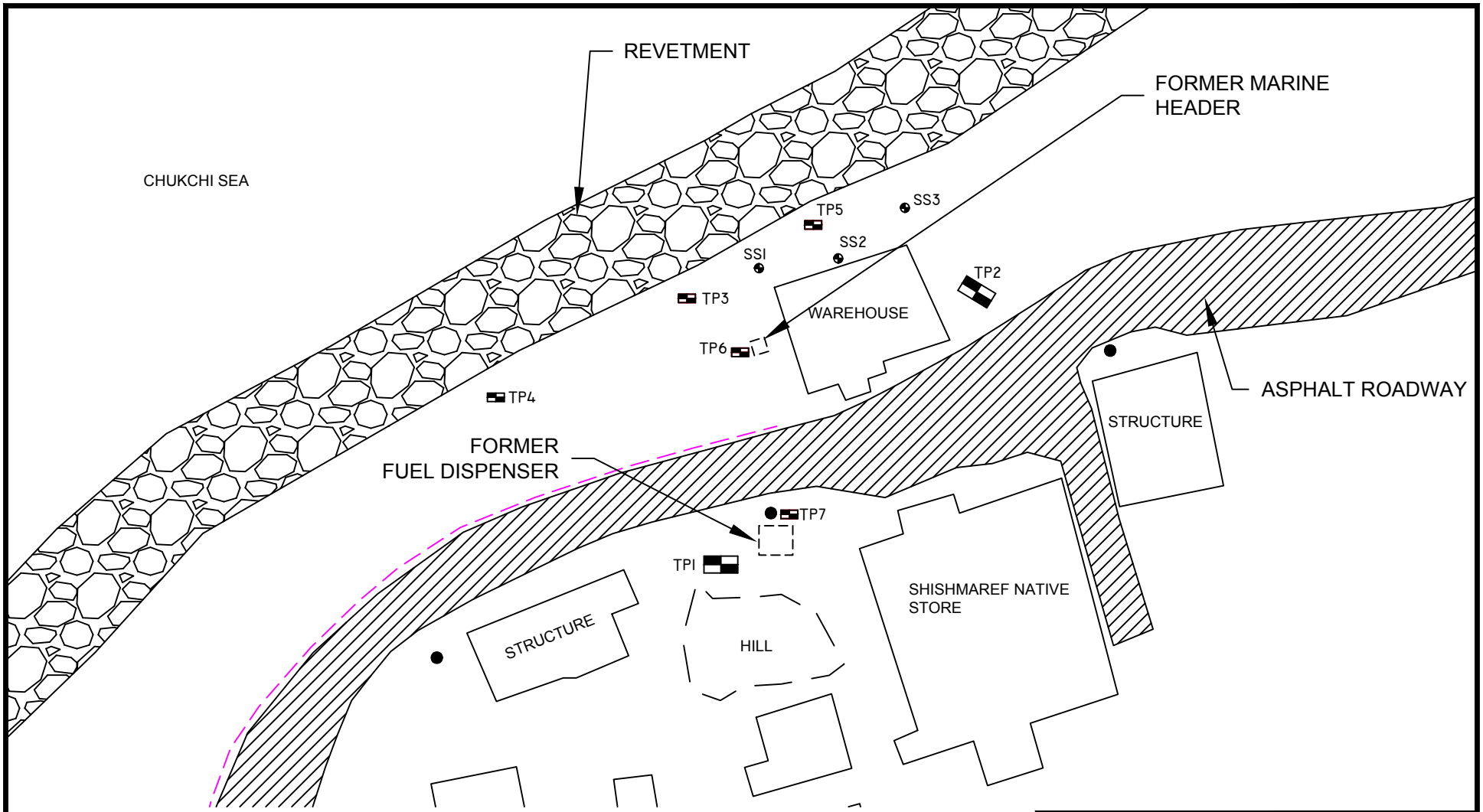
Shishmaref Native Store
Shishmaref, Alaska

VICINITY MAP

February 2019 32-1-20017

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Fig. 1



LEGEND

- Guard Rail
- Hand Dug Test Pit
- Surface Sample
- Light Pole
- Excavator Dug Test Pit

NOTES

All locations are approximate. Building locations interpreted from the 2004 Community Map provided the Alaska Department of Commerce, Community, and Economic Development.

0 20 40 80

APPROXIMATE SCALE IN FEET

N

Shishmaref Native Store
Shismaref, Alaska

SITE PLAN

February 2019 32-1-20017

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 2

APPENDIX A

FIELD NOTES

Shismaref Nickle Store 9/26/18

TEST PITS

0730 Calibrate PID

Sample ID	Collect time	Read time	Reading	Depth	~~Soil type~~ color
TP1-1	0814	0956	0.0	2	N
TP1-2	0820	0956	0.0	4	N
TP1-3	0826	0957	0.0	6	N
★ TP1-4	0833	0957	72	8	petrol odor
★ TP1-5	0842	0958	214	10	↓
—	—	—	—	—	—
TP2-1	0926	1015	0.0	2	N
TP2-2	0934	1015	12.6	4	Diesel
★TP2-3 & 3A	0939	1028	26.0	6	↓
TP2-4	0947	1028	18.0	8	
TP2-5	0958	1029	16.9	10	
★ TP2-6	1002	1035	52	11	↓
—	—	—	—	—	—
★ TP3-1	1139	1158	305	~~0.5~~ 3.5	gasoline
★TP3-2 & 2A	1134	1158	417	5.5	gasoline

Rite in the Rain

0810 Start digging Test pit 2
0834 Due to non-cohesive soils large amount of slough generated 12'x4'x10' for test pit 2
0844 Backfill TP-1

1002 Encounter permafrost / hard strata @ 11' cannot dig further 10'x6'x11' for test pit 2
1044 Excavator leaves site after backfilling TP-2
1050 Discuss the plans with Dr. sampling plan modified
1055 Dig TP3 by hand
1217 Backfill TP3, start digging TP4
1250 Collect field screening samples from TP4
1332 Backfill TP4 and dig TP5
1404 Encounter debris in TP4 @ 4' bgs, cannot advance further w/ hand tools

Shishmaref 9/26/18

Sample ID	Collect time	Rept Time	Redox	Depth	
TP4-1	1255	1325	0.0	0.5	none
TP4-2	1255	1325	0.0	2	
TP4-3	1254	1324	0.0	4	
TP4-4	1253	1324	0.0	6	
- - - -	- -	- -	- -	- -	- - -
TP5-1	1407	1437	24.3	0.5	slight
TP5-2	1406	1436	101	2	
TP5-3	1405	1435	74	4	
- - - -	-	- -	- -	- -	-
SS1	1412	1455	11.1	0.5	slight
SS2	1413	1456	3.0	0.5	
SS3	1415	1457	0.0	0.5	
- - - - -	-	- -	-	- -	-
SP6-1	1557	1624	263	0.5	strong
SP6-2	1553	1623	289	2	
SP6-3	1549	1623	284	4	
- - - -	-	- -	-	-	- - -
SP7-1	1655	1727	~~180~~	0.5	117
SP7-2	1651	1727	~~365~~	2	250
SP7-3	1645	Rite in the Rain.	~~291~~	4	552

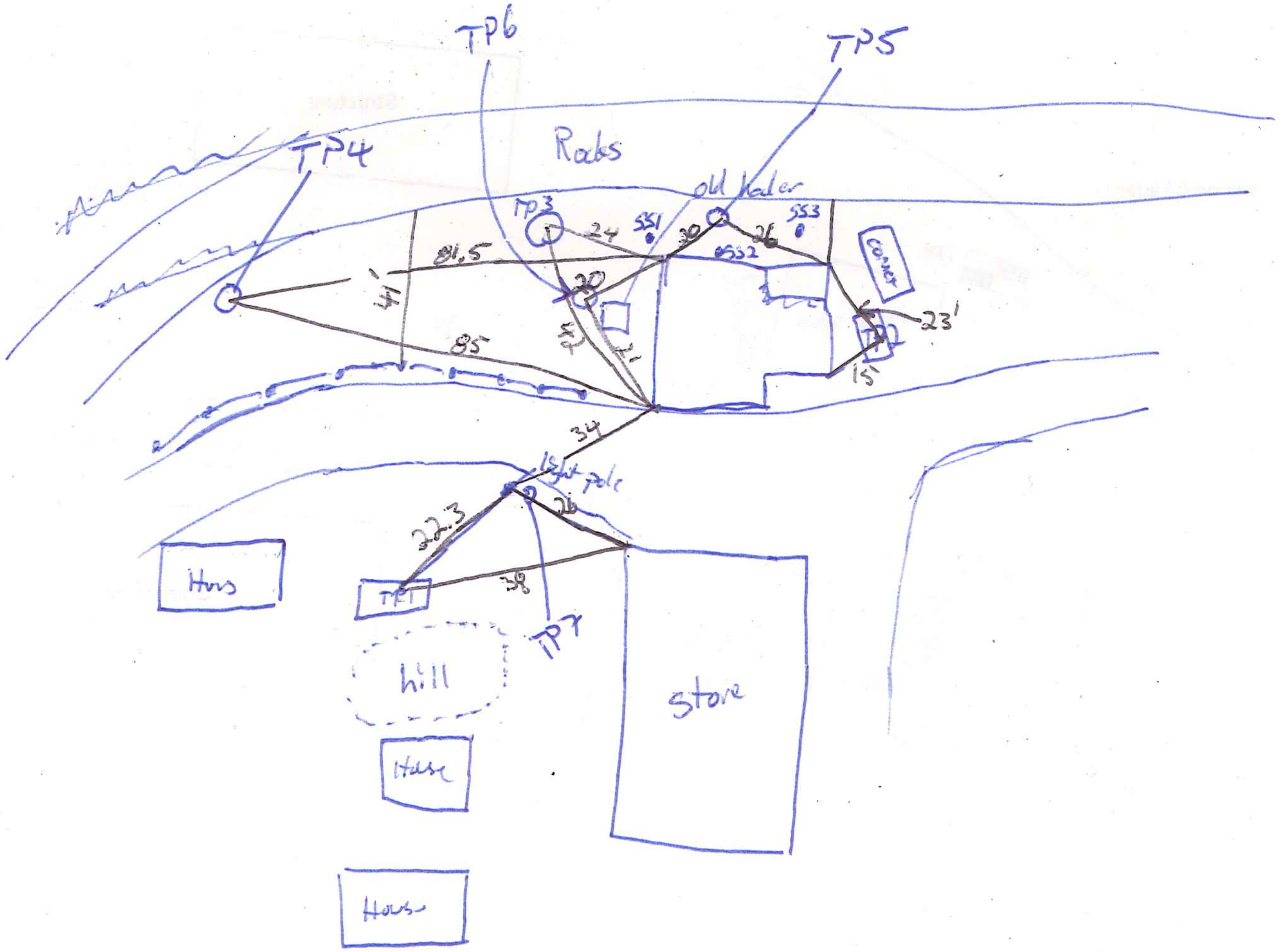
1410 Collect some surface sediment samples near shoreline, see figure SS1, SS2, SS3

1515 Back fill TP5

1616 Back fill ~~TP7~~ TP6

1640 Dig TP7 near light pole

1701 Conclude sampling begin cleanup


TP6
TP5
TP4
Rocks
TP3
old Kaler
SS1
SS2
SS3
24
30
26
81.5
41'
20
42
11
85
Corner
23'
15'
34
light pole
22.3
26
38
TP1
TP7
Hus
hill
House
House
store
…ig. 2

APPENDIX B

SITE PHOTOGRAPHS

Photo 1: Looking north towards the Warehouse from the Shishmaref Native Store. (September 26, 2018)

Photo 2: Looking east showing the revetment north of the Warehouse. (September 27, 2018)

Shishmaref Native Store
Shishmaref, Alaska

PHOTOS 1 AND 2

February 2019 31-1-20017

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

Photo 3: Looking east, showing extent of powerlines that restricted excavator access. (September 26, 2018)

Photo 4: Looking south at Test Pit TP2. (September 26, 2018)

Shishmaref Native Store Shishmaref, Alaska	
PHOTOS 3 AND 4	
February 2019	31-1-20017
SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	B-2

Photo 5: Looking east at Test Pit TP3. (September 26, 2018)

Photo 6: Looking southeast at Test Pit TP5. (September 26, 2018)

Shishmaref Native Store
Shishmaref, Alaska

PHOTOS 5 AND 6

February 2019 32-1-20017

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

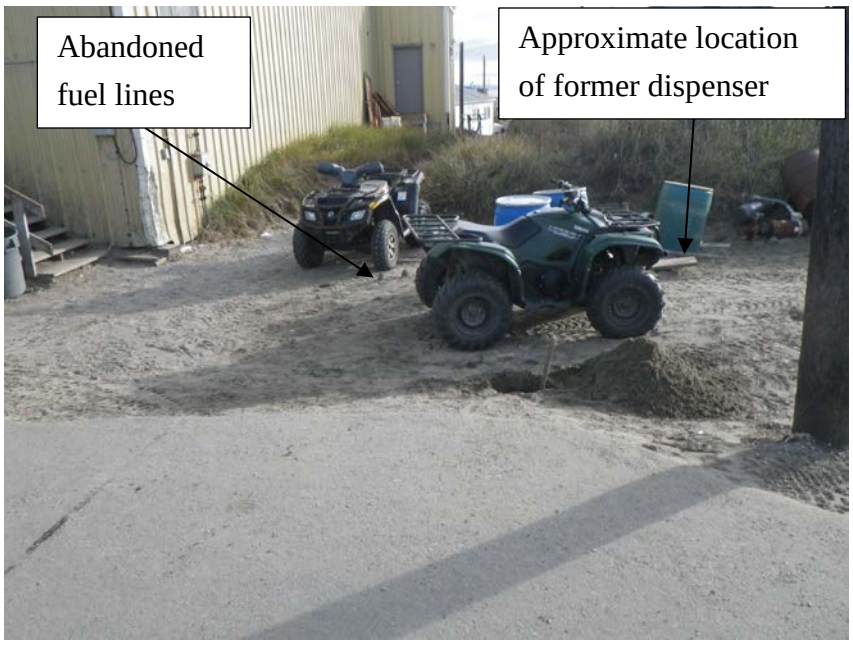


Photo 7: Looking south at Test Pit TP7. (September 26, 2018)

Photo 8: Looking into the cellar beneath the Warehouse. (September 26, 2018)

Photo 9: Looking north at the Shishmaref Native Store foundation. (September 26, 2018)

APPENDIX C

INDOOR AIR QUALITY SURVEYS

main building

APPENDIX I

DEC Building Survey and Indoor Air Sampling Questionnaire

ALASKA DEPARTMENT OF ENVIRONMENAL CONSERVATION
BUILDING INVENTORY AND INDOOR AIR SAMPLING QUESTIONNAIRE

This form should be prepared by a person familiar with indoor air assessments with assistance from a person knowledgeable about the building. Complete this form for each building where interior samples (e.g., indoor air, crawl space, or subslab soil gas samples) will be collected. Section I of this form should be used to assist in choosing an investigative strategy during workplan development. Section II should be used to assist in identification of complicating factors during a presampling building walk-through.

Preparer's Name Matt Wade Date/Time Prepared _____

Preparer's Affiliation _____ Phone No. _____

Purpose of Investigation _____

SECTION I: BUILDING INVENTORY

1. OCCUPANT OR BUILDING PERSONNEL:

Interviewed: Y / N

Last Name _____ First Name _____

Address _____

City _____

Phone No. _____

Number of Occupants/people at this location _____ Age of Occupants _____

2. OWNER or LANDLORD: (Check if same as occupant ____.)

Interviewed: Y / N

Last Name _____ First Name _____

Address _____

City _____

Phone No. _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response.)

Residential	School	(Commercial/Multi-use)
Industrial	Church	Other _____

If the property is residential, what type? (Circle appropriate response.)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouse/Condo
Modular	Log Home	Other_____

If multiple units, how many?_____

If the property is commercial, what type?

Business types(s) Store, retail

Does it include residences (i.e., multi-use)? Y (N) If yes, how many?_____

Other characteristics:

Number of floors 1 Building age_____

Is the building insulated? (Y) / N How airtight? Tight / Average / Not Tight

Have occupants noticed chemical odors in the building? Y / (N)

If yes, please describe:_____

_____

4. AIRFLOW

Use air current tubes, tracer smoke, or knowledge about the building to evaluate airflow patterns and qualitatively describe:

Airflow between floors

only one floor

Airflow in building near suspected source

possibly doorway

Outdoor air infiltration

Big door and fan location

Infiltration into air ducts

no

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply.)

a. Above-grade construction:	wood frame	log	concrete	brick
	constructed on pilings with enclosed air space		constructed on pilings with open air space	
b. Basement type:	full	crawlspace	slab-on-grade	other_____
c. Basement floor:	concrete	dirt	stone	other_____
d. Basement floor:	unsealed	sealed	sealed with_____	
e. Foundation walls:	poured	block	stone	other_____
f. Foundation walls:	unsealed	sealed	sealed with_____	
g. The basement is:	wet	damp	dry	
h. The basement is:	finished	unfinished	partially finished	
i. Sump present?	Y / N			
j. Water in sump?	Y / N / not applicable			

no basement

Basement or lowest level depth below grade_____(feet).

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, and drains).

_____

_____

6. **HEATING, VENTING, and AIR CONDITIONING** (Circle all that apply.)

Type of heating system(s) used in this building: (Circle all that apply – not just primary.)

Hot air circulation	Heat pump	Hot water baseboard	
Space heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other_____

The primary type of fuel used is:

Natural gas	Fuel oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank is fueled by:_____

Boiler/furnace is located in: Basement Outdoors Main floor Other_____

Do any of the heating appliances have cold-air intakes? Y / N
Type of air conditioning or ventilation used in this building:

Central air	Window units	Open windows	None
Commercial HVAC	Heat-recovery system	Passive air system	

Are there air distribution ducts present? Y / N

Describe the ventilation system in the building, its condition where visible, and the tightness of duct joints. Indicate the location of air supply and exhaust points on the floor plan.

_____

_____

_____

_____

Is there a radon mitigation system for the building/structure? Y / N Date of Installation —

Is the system active or passive? Active/Passive

7. **OCCUPANCY**

Is basement/lowest level occupied? no basement Full-time Occasionally Seldom Almost never

Level	**General Use of Each Floor (e.g., family room, bedroom, laundry, workshop, or storage).**
Basement	—
1st Floor	retail store
2nd Floor	—
3rd Floor	—

8. **WATER AND SEWAGE**

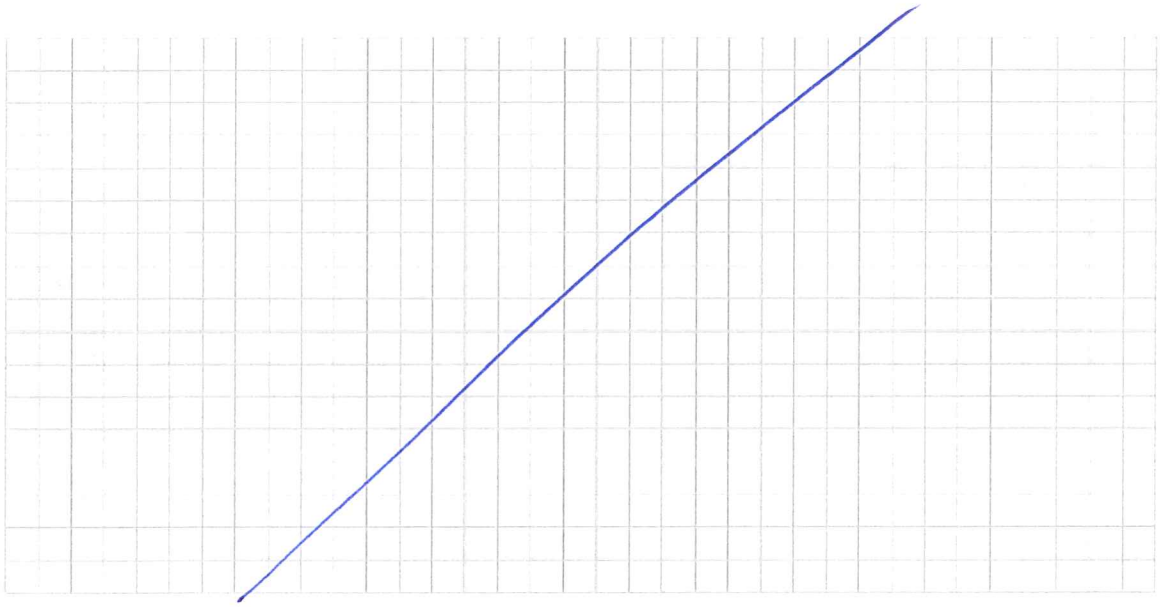
Water supply: Public water Drilled well Driven well Dug well Other none

Sewage disposal: Public sewer Septic tank Leach field Dry well Other none

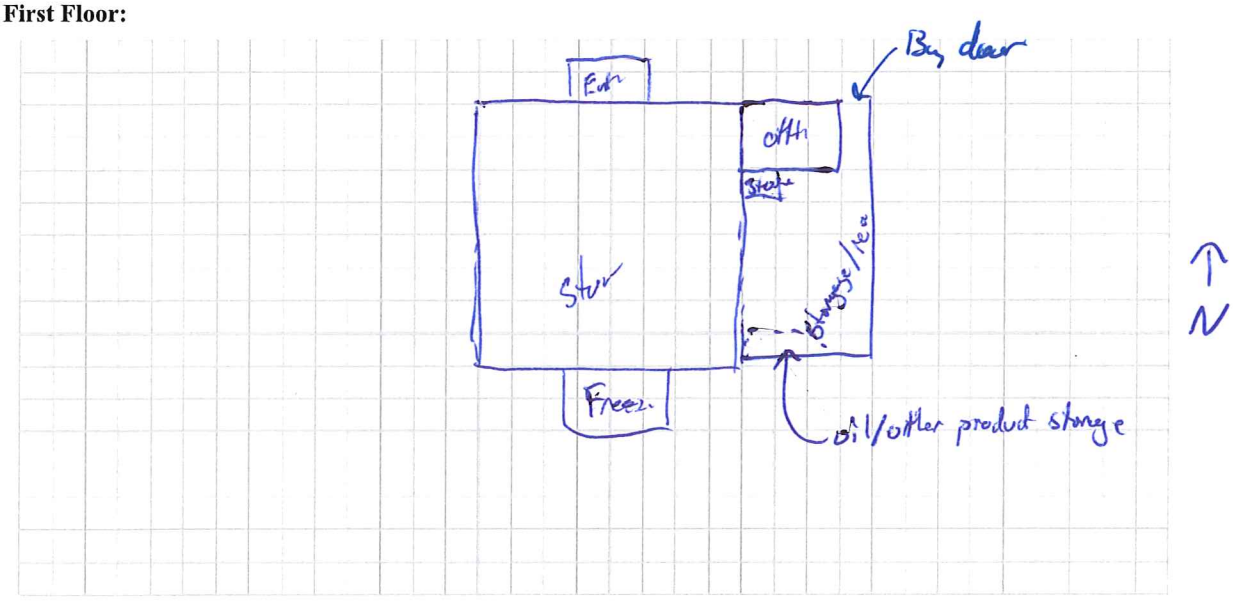
9. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note that.

Basement:



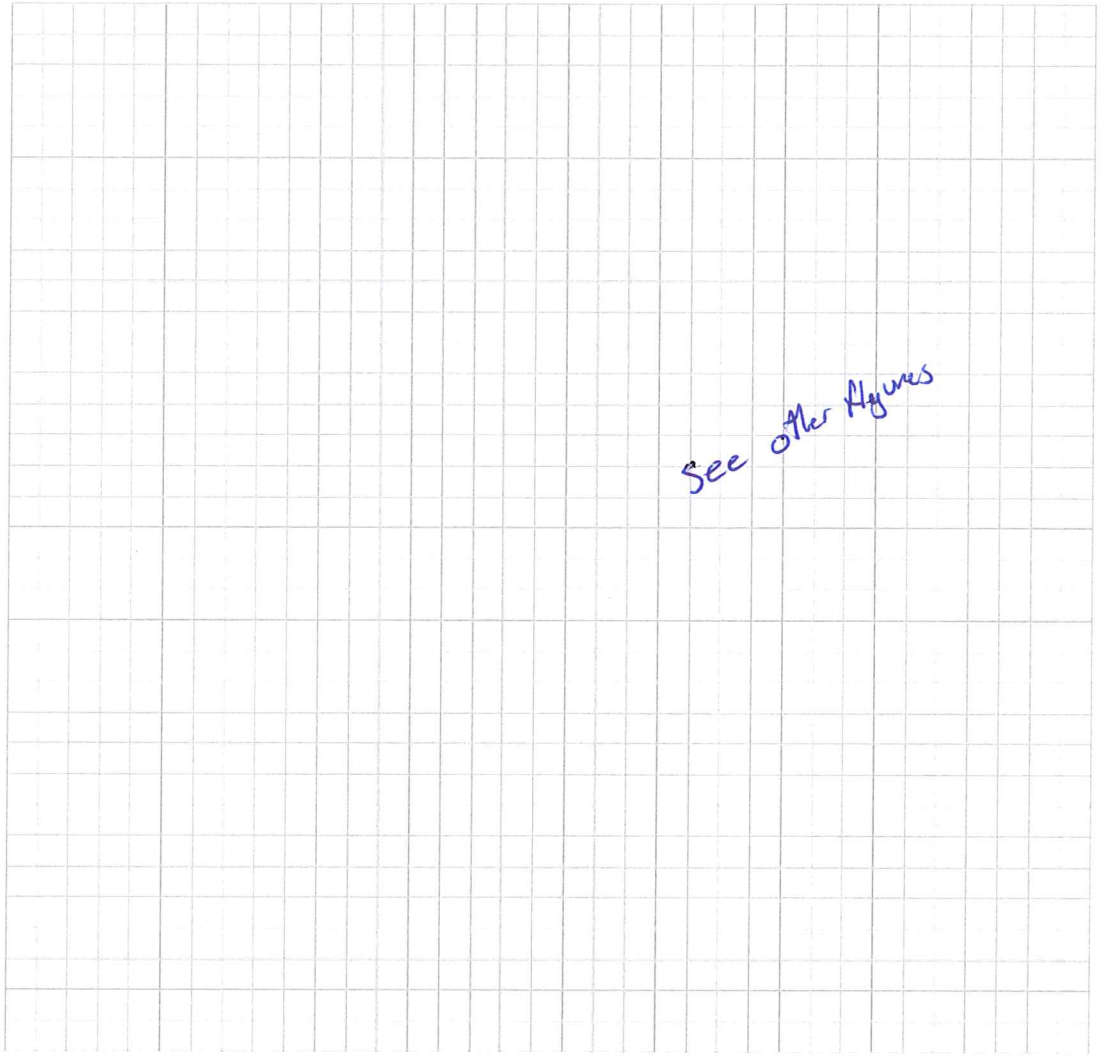
First Floor:



10. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (e.g., industries, gas stations, repair shops, landfills, etc.), outdoor air sampling locations and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the location of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



SECTION II: INDOOR AIR SAMPLING QUESTIONNAIRE

This section should be completed during a presampling walk-through. If indoor air sources of COCs are identified and removed, consider ventilating the building prior to sampling. However, ventilation and heating systems should be operating normally for 24 hours prior to sampling.

a) 1. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

Is there an attached garage? Y / (N)

Does the garage have a separate heating unit? Y / N / (NA)

Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, ATV, or car) Y / N / (NA)

Please specify_____

Has the building ever had a fire? Y / (N) When?_____

Is a kerosene or unvented gas space heater present? Y / (N) Where?_____

Is there a workshop or hobby/craft area? Y / (N) Where and type_____

Is there smoking in the building? Y / (N) How frequently?_____

Has painting/staining been done in the last six months? Y / (N) Where and when?_____

Is there new carpet, drapes or other textiles? Y / (N) Where and when?_____

Is there a kitchen exhaust fan? Y / (N) If yes, where is it vented?_____

Is there a bathroom exhaust fan? Y / (N) If yes, where is it vented?_____

Is there a clothes dryer? Y / (N) If yes, is it vented outside? Y / N

Are cleaning products, cosmetic products, or pesticides used that could interfere with indoor air sampling? Y / (N)

If yes, please describe_____

_____

_____

Do any of the building occupants use solvents at work? Y / N -

(For example, is the building used for chemical manufacturing or a laboratory, auto mechanic or auto body shop, painting shop, fuel oil delivery area, or do any of the occupants work as a boiler mechanic, pesticide applicator, or cosmetologist?)

If yes, what types of solvents are used?_____

If yes, are his/her/their clothes washed at work? Y / (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry cleaning regularly (weekly) (No) - no dry cleaning

Yes, use dry cleaning infrequently (monthly or less) Unknown

Yes, work at a dry cleaning services

2. **PRODUCT INVENTORY FORM** (For use during building walk-through.)

Make and model of field instrument used: _____

List specific products found in the residence that have the potential to affect indoor air quality:

Location	Product Description	Site (units)	Condition[1]	Chemical Ingredients	Field Instrument Reading (units)	Photo[2] Y / N

[1] Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**.

[2] Photographs of the front and back of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

This form was modified from:

ITRC (Interstate Technology and Regulatory Council). 2007. *Vapor Intrusion Pathway: A Practical Guideline*. VI-1. Washington, D.C.: Interstate Technology and Regulatory Council, Vapor Intrusion Team. Available at: www.itrcweb.org.

warehouse

APPENDIX I

DEC Building Survey and Indoor Air Sampling Questionnaire

ALASKA DEPARTMENT OF ENVIRONMENAL CONSERVATION
BUILDING INVENTORY AND INDOOR AIR SAMPLING QUESTIONNAIRE

This form should be prepared by a person familiar with indoor air assessments with assistance from a person knowledgeable about the building. Complete this form for each building where interior samples (e.g., indoor air, crawl space, or subslab soil gas samples) will be collected. Section I of this form should be used to assist in choosing an investigative strategy during workplan development. Section II should be used to assist in identification of complicating factors during a presampling building walk-through.

Preparer's Name Matt Wands Date/Time Prepared _____

Preparer's Affiliation _____ Phone No. _____

Purpose of Investigation _____

SECTION I: BUILDING INVENTORY

1. OCCUPANT OR BUILDING PERSONNEL:

Interviewed: (Y) / N

Last Name _____ First Name _____

Address _____

City _____

Phone No. _____

Number of Occupants/people at this location ~1 Age of Occupants Various

2. OWNER or LANDLORD: (Check if same as occupant ____.)

Interviewed: Y / N

Last Name _____ First Name _____

Address _____

City _____

Phone No. _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response.)

Residential	School	(Commercial/Multi-use)
Industrial	Church	Other _____

If the property is residential, what type? (Circle appropriate response.)

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouse/Condo
Modular	Log Home	Other_____

If multiple units, how many?_____

If the property is commercial, what type?

Business types(s) store, retail (used as warehouse)

Does it include residences (i.e., multi-use)? Y / (N) If yes, how many? —

Other characteristics:

Number of floors 2 (including cellar) Building age unknown

Is the building insulated? Y / (N) How airtight? Tight / Average / (Not Tight)

Have occupants noticed chemical odors in the building? (Y) / N

If yes, please describe: building smells of mold and fuel.

4. **AIRFLOW**

Use air current tubes, tracer smoke, or knowledge about the building to evaluate airflow patterns and qualitatively describe:

Airflow between floors

Yes, loose wooden floor seperates main floor from cellar

Airflow in building near suspected source

Outdoor air infiltration

Infiltration into air ducts

no air ducts.

5. **BASEMENT AND CONSTRUCTION CHARACTERISTICS** (Circle all that apply.)

a. Above-grade construction:	wood frame	log	concrete	brick
	constructed on pilings with enclosed air space		constructed on pilings with open air space	
b. Basement type:	full	crawlspace	slab-on-grade	other cellar
c. Basement floor:	concrete	dirt	stone	other
d. Basement floor:	unsealed	sealed	sealed with	
e. Foundation walls:	poured	block	stone	other
f. Foundation walls:	unsealed	sealed	sealed with	
g. The basement is:	wet	damp	dry	
h. The basement is:	finished	unfinished	partially finished	
i. Sump present?	Y / N			
j. Water in sump?	Y / N / not applicable			

Basement or lowest level depth below grade ~7ft (feet).

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, and drains).

Entire building

6. **HEATING, VENTING, and AIR CONDITIONING** (Circle all that apply.)

Type of heating system(s) used in this building: (Circle all that apply – not just primary.)

Hot air circulation	Heat pump	Hot water baseboard	
Space heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other no heat, cold storage

The primary type of fuel used is:

Natural gas	Fuel oil	Kerosene
Electric	Propane	Solar
Wood	Coal	

Domestic hot water tank is fueled by: no hot water

Boiler/furnace is located in: Basement Outdoors Main floor Other N/A

Do any of the heating appliances have cold-air intakes? Y / N

Type of air conditioning or ventilation used in this building:

Central air	Window units	Open windows	None
Commercial HVAC	Heat-recovery system	Passive air system	

Are there air distribution ducts present? Y / N

Describe the ventilation system in the building, its condition where visible, and the tightness of duct joints. Indicate the location of air supply and exhaust points on the floor plan.

_____

_____

_____

_____

Is there a radon mitigation system for the building/structure? Y / (N) Date of Installation_____

Is the system active or passive? ~~Active/Passive~~

7. OCCUPANCY

Is basement/lowest level occupied? Full-time Occasionally Seldom (Almost never)

Level	**General Use of Each Floor (e.g., family room, bedroom, laundry, workshop, or storage).**
Basement	no longer used, appears empty
1st Floor	cold storage
2nd Floor	
3rd Floor	

8. WATER AND SEWAGE

Water supply: Public water Drilled well Driven well Dug well Other none

Sewage disposal: Public sewer Septic tank Leach field Dry well Other none

9. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note that.

Basement:

Exact size of basement unknown, unable to access,

First Floor:

10. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (e.g., industries, gas stations, repair shops, landfills, etc.), outdoor air sampling locations and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the location of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.

SECTION II: INDOOR AIR SAMPLING QUESTIONNAIRE

This section should be completed during a presampling walk-through. If indoor air sources of COCs are identified and removed, consider ventilating the building prior to sampling. However, ventilation and heating systems should be operating normally for 24 hours prior to sampling.

a) 1. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

Is there an attached garage? Y / (N)

Does the garage have a separate heating unit? Y / N / (NA)

Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, ATV, or car) (Y) / N /NA

Please specify ATV in bathtub

Has the building ever had a fire? Y / (N) When?_____

Is a kerosene or unvented gas space heater present? Y / (N) Where?_____

Is there a workshop or hobby/craft area? Y / (N) Where and type_____

Is there smoking in the building? Y / (N) How frequently?_____

Has painting/staining been done in the last six months? Y / (N) Where and when?_____

Is there new carpet, drapes or other textiles? Y / (N) Where and when?_____

Is there a kitchen exhaust fan? Y / (N) If yes, where is it vented?_____

Is there a bathroom exhaust fan? Y / (N) If yes, where is it vented?_____

Is there a clothes dryer? Y / (N) If yes, is it vented outside? Y / N

Are cleaning products, cosmetic products, or pesticides used that could interfere with indoor air sampling? Y / N

If yes, please describe_____

_____

_____

Do any of the building occupants use solvents at work? Y / (N)

(For example, is the building used for chemical manufacturing or a laboratory, auto mechanic or auto body shop, painting shop, fuel oil delivery area, or do any of the occupants work as a boiler mechanic, pesticide applicator, or cosmetologist?)

If yes, what types of solvents are used?_____

If yes, are his/her/their clothes washed at work? Y / N

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry cleaning regularly (weekly) (No)

Yes, use dry cleaning infrequently (monthly or less) Unknown

Yes, work at a dry cleaning services

2. **PRODUCT INVENTORY FORM** (For use during building walk-through.)

Make and model of field instrument used:_____

List specific products found in the residence that have the potential to affect indoor air quality:

Location	Product Description	Site (units)	Condition[1]	Chemical Ingredients	Field Instrument Reading (units)	Photo[2] Y / N

[1] Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**.

[2] Photographs of the front and back of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

This form was modified from:

ITRC (Interstate Technology and Regulatory Council). 2007. *Vapor Intrusion Pathway: A Practical Guideline*. VI-1. Washington, D.C.: Interstate Technology and Regulatory Council, Vapor Intrusion Team. Available at: www.itrcweb.org.

APPENDIX D

RESULTS OF ANALYTICAL TESTING BY SGS NORTH AMERICA INC. AND ADEC LABORATORY DATA REVIEW CHECKLIST

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St. Suite 3
Anchorage, AK 99518
(907)433-3240

Report Number: **1185570**

Client Project: **Shishmaref Native Store**

Dear Matt Woods,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jillian at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Jillian Vlahovich Date
Project Manager
Jillian.Vlahovich@sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1185570**
Project Name/Site: **Shishmaref Native Store**
Project Contact: **Matt Woods**

Refer to sample receipt form for information on sample condition.

TP1-4 (1185570001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP1-5 (1185570002) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP2-3 (1185570003) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP2-39 (1185570004) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP3-2 (1185570006) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP3-29 (1185570007) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP5-2 (1185570009) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP6-1 (1185570012) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP6-3 (1185570013) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP7-1 (1185570014) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

TP7-3 (1185570015) PS

8270D SIM - PAH surrogate recovery for 2-Methylnaphthalene-d10 and Fluoranthene-d10 does not meet QC criteria due to matrix interference.
AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria due to matrix interference.

LCS for HBN 1787256 [VXX/33267 (1480609) LCS

8260C - LCS recovery for trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1185570**
Project Name/Site: **Shishmaref Native Store**
Project Contact: **Matt Woods**

1185570006MS (1479326) MS

8270D SIM - PAH MS recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1185684001MS (1480610) MS

8260C - MS recoveries for trichlorofluoromethane and hexachlorobutadiene do not meet QC criteria.

TP1-5(1185570002MS) (1481346) MS

8021B -MS recoveries for several analytes do not meet QC criteria. Refer to LCS/LCSD for accuracy

1185570006MSD (1479327) MSD

8270D SIM - PAH MSD recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1185684001MSD (1480611) MSD

8260C - MSD RPD for trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the parent sample.

TP1-5(1185570002MSD) (1481347) MSD

8021B -MSD recoveries for several analytes do not meet QC criteria. Refer to LCS/LCSD for accuracy

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

SGS North America Inc. 200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
TP1-4	1185570001	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP1-5	1185570002	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP2-3	1185570003	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP2-39	1185570004	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP2-6	1185570005	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP3-2	1185570006	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP3-29	1185570007	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP4-4	1185570008	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP5-2	1185570009	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP5-3	1185570010	09/26/2018	09/28/2018	Soil/Solid (dry weight)
SS1	1185570011	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP6-1	1185570012	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP6-3	1185570013	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP7-1	1185570014	09/26/2018	09/28/2018	Soil/Solid (dry weight)
TP7-3	1185570015	09/26/2018	09/28/2018	Soil/Solid (dry weight)
Trip Blank 01	1185570016	09/26/2018	09/28/2018	Soil/Solid (dry weight)

Method	Method Description
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel Range Organics (S)
AK101	Gasoline Range Organics (S)
SM21 2540G	Percent Solids SM2540G
SW8260C	VOC 8260 (S) Field Extracted

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **TP1-4**
Lab Sample ID: 1185570001
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	1530	mg/Kg
Ethylbenzene	32.6	ug/Kg
Gasoline Range Organics	33.8	mg/Kg
o-Xylene	815	ug/Kg
P & M -Xylene	185	ug/Kg
Xylenes (total)	1000	ug/Kg

Client Sample ID: **TP1-5**
Lab Sample ID: 1185570002
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	407	mg/Kg
Ethylbenzene	83.1	ug/Kg
Gasoline Range Organics	122	mg/Kg
o-Xylene	4410	ug/Kg
P & M -Xylene	892	ug/Kg
Xylenes (total)	5310	ug/Kg

Client Sample ID: **TP2-3**
Lab Sample ID: 1185570003
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	2040	mg/Kg
Benzene	6.59J	ug/Kg
Ethylbenzene	235	ug/Kg
Gasoline Range Organics	227	mg/Kg
o-Xylene	3480	ug/Kg
P & M -Xylene	970	ug/Kg
Toluene	34.1	ug/Kg
Xylenes (total)	4450	ug/Kg

Client Sample ID: **TP2-39**
Lab Sample ID: 1185570004
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	2200	mg/Kg
Benzene	5.80J	ug/Kg
Ethylbenzene	176	ug/Kg
Gasoline Range Organics	188	mg/Kg
o-Xylene	2950	ug/Kg
P & M -Xylene	916	ug/Kg
Toluene	31.6	ug/Kg
Xylenes (total)	3870	ug/Kg

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **TP2-6**
Lab Sample ID: 1185570005

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	432	mg/Kg
Volatile Fuels	Benzene	7.49J	ug/Kg
	Ethylbenzene	7.07J	ug/Kg
	Gasoline Range Organics	8.96	mg/Kg
	o-Xylene	143	ug/Kg
	P & M -Xylene	82.8	ug/Kg
	Toluene	20.6J	ug/Kg
	Xylenes (total)	226	ug/Kg

Client Sample ID: **TP3-2**
Lab Sample ID: 1185570006

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	5870	ug/Kg
	2-Methylnaphthalene	5080	ug/Kg
	Fluoranthene	13.4J	ug/Kg
	Fluorene	259J	ug/Kg
	Naphthalene	3180	ug/Kg
	Pyrene	18.2J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	1580	mg/Kg
Volatile Fuels	Gasoline Range Organics	1140	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	115000	ug/Kg
	1,3,5-Trimethylbenzene	37300	ug/Kg
	4-Isopropyltoluene	4940	ug/Kg
	Benzene	362	ug/Kg
	Ethylbenzene	2580	ug/Kg
	Isopropylbenzene (Cumene)	738	ug/Kg
	Naphthalene	4860	ug/Kg
	n-Propylbenzene	1010	ug/Kg
	o-Xylene	90100	ug/Kg
	P & M -Xylene	179000	ug/Kg
	sec-Butylbenzene	697	ug/Kg
	Toluene	28800	ug/Kg
	trans-1,2-Dichloroethene	344J	ug/Kg
	Xylenes (total)	269000	ug/Kg

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **TP3-29**
Lab Sample ID: 1185570007

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	4550	ug/Kg
	2-Methylnaphthalene	4180	ug/Kg
	Acenaphthene	80.1	ug/Kg
	Fluoranthene	11.0J	ug/Kg
	Fluorene	182	ug/Kg
	Naphthalene	2740	ug/Kg
	Phenanthrene	132	ug/Kg
	Pyrene	15.7J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	1630	mg/Kg
Volatile Fuels	Gasoline Range Organics	861	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	87300	ug/Kg
	1,3,5-Trimethylbenzene	30200	ug/Kg
	4-Isopropyltoluene	3860	ug/Kg
	Benzene	227	ug/Kg
	Ethylbenzene	1830	ug/Kg
	Isopropylbenzene (Cumene)	540	ug/Kg
	Naphthalene	3570	ug/Kg
	n-Propylbenzene	750	ug/Kg
	o-Xylene	66400	ug/Kg
	P & M -Xylene	128000	ug/Kg
	sec-Butylbenzene	495	ug/Kg
	Toluene	19800	ug/Kg
	Xylenes (total)	194000	ug/Kg

Client Sample ID: **TP5-2**
Lab Sample ID: 1185570009

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	3710	mg/Kg
Volatile Fuels	Benzene	5.77J	ug/Kg
	Ethylbenzene	13.5J	ug/Kg
	Gasoline Range Organics	59.2	mg/Kg
	o-Xylene	311	ug/Kg
	P & M -Xylene	71.6	ug/Kg
	Toluene	39.8	ug/Kg
	Xylenes (total)	382	ug/Kg

Client Sample ID: **TP5-3**
Lab Sample ID: 1185570010

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	842	mg/Kg
Volatile Fuels	Benzene	5.41J	ug/Kg
	Gasoline Range Organics	2.57	mg/Kg
	o-Xylene	28.4	ug/Kg
	P & M -Xylene	36.2J	ug/Kg
	Toluene	48.7	ug/Kg
	Xylenes (total)	64.5J	ug/Kg

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Detectable Results Summary

Client Sample ID: **SS1**
Lab Sample ID: 1185570011

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	2520	mg/Kg
Volatile Fuels	o-Xylene	9.58J	ug/Kg

Client Sample ID: **TP6-1**
Lab Sample ID: 1185570012

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	5230	mg/Kg
Volatile Fuels	Benzene	383	ug/Kg
	Ethylbenzene	24.3	ug/Kg
	Gasoline Range Organics	76.3	mg/Kg
	o-Xylene	267	ug/Kg
	P & M -Xylene	147	ug/Kg
	Toluene	52.6	ug/Kg
	Xylenes (total)	414	ug/Kg

Client Sample ID: **TP6-3**
Lab Sample ID: 1185570013

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	1500	ug/Kg
	2-Methylnaphthalene	2980	ug/Kg
	Acenaphthene	35.8	ug/Kg
	Benzo[b]Fluoranthene	7.74J	ug/Kg
	Fluoranthene	13.9J	ug/Kg
	Fluorene	97.4	ug/Kg
	Naphthalene	4320	ug/Kg
	Phenanthrene	92.4	ug/Kg
	Pyrene	18.7J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	1020	mg/Kg
Volatile Fuels	Gasoline Range Organics	1820	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	168000	ug/Kg
	1,3,5-Trimethylbenzene	35700	ug/Kg
	4-Isopropyltoluene	3060	ug/Kg
	Benzene	674	ug/Kg
	Ethylbenzene	4960	ug/Kg
	Isopropylbenzene (Cumene)	2320	ug/Kg
	Naphthalene	4950	ug/Kg
	n-Propylbenzene	4640	ug/Kg
	o-Xylene	181000	ug/Kg
	P & M -Xylene	395000	ug/Kg
	sec-Butylbenzene	934	ug/Kg
	Toluene	72500	ug/Kg
	Xylenes (total)	576000	ug/Kg

Detectable Results Summary

Client Sample ID: **TP7-1**
Lab Sample ID: 1185570014

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	4020	mg/Kg
Volatile Fuels	Ethylbenzene	43.0	ug/Kg
	Gasoline Range Organics	34.2	mg/Kg
	o-Xylene	1010	ug/Kg
	P & M -Xylene	269	ug/Kg
	Toluene	9.86J	ug/Kg
	Xylenes (total)	1280	ug/Kg

Client Sample ID: **TP7-3**
Lab Sample ID: 1185570015

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	10400	ug/Kg
	2-Methylnaphthalene	14000	ug/Kg
	Acenaphthene	151	ug/Kg
	Anthracene	23.3J	ug/Kg
	Chrysene	8.01J	ug/Kg
	Fluoranthene	28.1	ug/Kg
	Fluorene	299	ug/Kg
	Naphthalene	7070	ug/Kg
	Phenanthrene	194	ug/Kg
	Pyrene	26.4J	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	3580	mg/Kg
Volatile Fuels	Gasoline Range Organics	654	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	104000	ug/Kg
	1,3,5-Trimethylbenzene	61100	ug/Kg
	4-Isopropyltoluene	5280	ug/Kg
	Ethylbenzene	1690	ug/Kg
	Isopropylbenzene (Cumene)	366J	ug/Kg
	Naphthalene	8480	ug/Kg
	n-Propylbenzene	439J	ug/Kg
	o-Xylene	98600	ug/Kg
	P & M -Xylene	94900	ug/Kg
	sec-Butylbenzene	318J	ug/Kg
	Toluene	3950	ug/Kg
	Xylenes (total)	194000	ug/Kg

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **TP1-4**

Client Sample ID: **TP1-4**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570001
Lab Project ID: 1185570

Collection Date: 09/26/18 08:33
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1530		20.5	6.37	mg/Kg	1		10/01/18 14:18
Surrogates								
5a Androstane (surr)	92		50-150		%	1		10/01/18 14:18

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 14:18
Container ID: 1185570001-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.179 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP1-4**

Client Sample ID: **TP1-4**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570001
Lab Project ID: 1185570

Collection Date: 09/26/18 08:33
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	33.8		2.40	0.720	mg/Kg	1		10/04/18 14:59
Surrogates								
4-Bromofluorobenzene (surr)	186	*	50-150		%	1		10/04/18 14:59

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 14:59
Container ID: 1185570001-B

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 09/26/18 08:33
Prep Initial Wt./Vol.: 57.91 g
Prep Extract Vol: 26.8797 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	6.00	U	12.0	3.84	ug/Kg	1		10/04/18 14:59
Ethylbenzene	32.6		24.0	7.48	ug/Kg	1		10/04/18 14:59
o-Xylene	815		24.0	7.48	ug/Kg	1		10/04/18 14:59
P & M -Xylene	185		48.0	14.4	ug/Kg	1		10/04/18 14:59
Toluene	12.0	U	24.0	7.48	ug/Kg	1		10/04/18 14:59
Xylenes (total)	1000		72.0	21.9	ug/Kg	1		10/04/18 14:59
Surrogates								
1,4-Difluorobenzene (surr)	92.7		72-119		%	1		10/04/18 14:59

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/04/18 14:59
Container ID: 1185570001-B

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 09/26/18 08:33
Prep Initial Wt./Vol.: 57.91 g
Prep Extract Vol: 26.8797 mL

Results of **TP1-5**

Client Sample ID: **TP1-5**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570002
Lab Project ID: 1185570

Collection Date: 09/26/18 08:42
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	407		20.5	6.36	mg/Kg	1		10/01/18 14:28
Surrogates								
5a Androstane (surr)	91.6		50-150		%	1		10/01/18 14:28

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 14:28
Container ID: 1185570002-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.326 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP1-5**

Client Sample ID: **TP1-5**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570002
Lab Project ID: 1185570

Collection Date: 09/26/18 08:42
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	122		10.1	3.02	mg/Kg	5		10/04/18 20:57
Surrogates								
4-Bromofluorobenzene (surr)	660	*	50-150		%	5		10/04/18 20:57

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 20:57
Container ID: 1185570002-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 08:42
Prep Initial Wt./Vol.: 71.014 g
Prep Extract Vol: 27.5437 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.05 U		10.1	3.22	ug/Kg	1		10/07/18 23:31
Ethylbenzene	83.1		20.1	6.28	ug/Kg	1		10/07/18 23:31
o-Xylene	4410		101	31.4	ug/Kg	5		10/04/18 20:57
P & M -Xylene	892		201	60.3	ug/Kg	5		10/04/18 20:57
Toluene	10.1 U		20.1	6.28	ug/Kg	1		10/07/18 23:31
Xylenes (total)	5310		302	91.7	ug/Kg	5		10/04/18 20:57
Surrogates								
1,4-Difluorobenzene (surr)	88.2		72-119		%	5		10/04/18 20:57

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/04/18 20:57
Container ID: 1185570002-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 08:42
Prep Initial Wt./Vol.: 71.014 g
Prep Extract Vol: 27.5437 mL

Analytical Batch: VFC14483
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/07/18 23:31
Container ID: 1185570002-B

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 08:42
Prep Initial Wt./Vol.: 71.014 g
Prep Extract Vol: 27.5437 mL

Results of **TP2-3**

Client Sample ID: **TP2-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570003
Lab Project ID: 1185570

Collection Date: 09/26/18 09:39
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2040		20.6	6.39	mg/Kg	1		10/01/18 14:39
Surrogates								
5a Androstane (surr)	96.9		50-150		%	1		10/01/18 14:39

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 14:39
Container ID: 1185570003-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.334 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP2-3**

Client Sample ID: **TP2-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570003
Lab Project ID: 1185570

Collection Date: 09/26/18 09:39
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	227		11.4	3.41	mg/Kg	5		10/04/18 21:15
Surrogates								
4-Bromofluorobenzene (surr)	1020	*	50-150		%	5		10/04/18 21:15

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 21:15
Container ID: 1185570003-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 09:39
Prep Initial Wt./Vol.: 63.047 g
Prep Extract Vol: 27.5251 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	6.59	J	11.4	3.64	ug/Kg	1		10/08/18 00:25
Ethylbenzene	235		22.7	7.09	ug/Kg	1		10/08/18 00:25
o-Xylene	3480		114	35.5	ug/Kg	5		10/04/18 21:15
P & M -Xylene	970		227	68.2	ug/Kg	5		10/04/18 21:15
Toluene	34.1		22.7	7.09	ug/Kg	1		10/08/18 00:25
Xylenes (total)	4450		341	104	ug/Kg	5		10/04/18 21:15
Surrogates								
1,4-Difluorobenzene (surr)	95.1		72-119		%	5		10/04/18 21:15

Batch Information

Analytical Batch: VFC14483
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/08/18 00:25
Container ID: 1185570003-B

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 09:39
Prep Initial Wt./Vol.: 63.047 g
Prep Extract Vol: 27.5251 mL

Analytical Batch: VFC14476
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/04/18 21:15
Container ID: 1185570003-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 09:39
Prep Initial Wt./Vol.: 63.047 g
Prep Extract Vol: 27.5251 mL

Results of **TP2-39**

Client Sample ID: **TP2-39**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570004
Lab Project ID: 1185570

Collection Date: 09/26/18 17:33
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):95.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2200		20.7	6.43	mg/Kg	1		10/01/18 14:49
Surrogates								
5a Androstane (surr)	100		50-150		%	1		10/01/18 14:49

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 14:49
Container ID: 1185570004-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.234 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP2-39**

Client Sample ID: **TP2-39**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570004
Lab Project ID: 1185570

Collection Date: 09/26/18 17:33
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):95.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	188		10.7	3.22	mg/Kg	5		10/08/18 01:00
Surrogates								
4-Bromofluorobenzene (surr)	938	*	50-150		%	5		10/08/18 01:00

Batch Information

Analytical Batch: VFC14483
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/18 01:00
Container ID: 1185570004-B

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 17:33
Prep Initial Wt./Vol.: 68.035 g
Prep Extract Vol: 27.9432 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.80 J		10.7	3.43	ug/Kg	1		10/04/18 21:51
Ethylbenzene	176		21.5	6.70	ug/Kg	1		10/04/18 21:51
o-Xylene	2950		21.5	6.70	ug/Kg	1		10/04/18 21:51
P & M -Xylene	916		42.9	12.9	ug/Kg	1		10/04/18 21:51
Toluene	31.6		21.5	6.70	ug/Kg	1		10/04/18 21:51
Xylenes (total)	3870		64.4	19.6	ug/Kg	1		10/04/18 21:51
Surrogates								
1,4-Difluorobenzene (surr)	96.6		72-119		%	1		10/04/18 21:51

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/04/18 21:51
Container ID: 1185570004-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 17:33
Prep Initial Wt./Vol.: 68.035 g
Prep Extract Vol: 27.9432 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP2-6**

Client Sample ID: **TP2-6**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570005
Lab Project ID: 1185570

Collection Date: 09/26/18 10:06
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):94.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	432		20.8	6.46	mg/Kg	1		10/01/18 15:20
Surrogates								
5a Androstane (surr)	90.7		50-150		%	1		10/01/18 15:20

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 15:20
Container ID: 1185570005-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.423 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP2-6**

Client Sample ID: **TP2-6**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570005
Lab Project ID: 1185570

Collection Date: 09/26/18 10:06
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):94.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	8.96		2.08	0.624	mg/Kg	1		10/08/18 18:47
Surrogates								
4-Bromofluorobenzene (surr)	128		50-150		%	1		10/08/18 18:47

Batch Information

Analytical Batch: VFC14484
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/18 18:47
Container ID: 1185570005-B

Prep Batch: VXX33300
Prep Method: SW5035A
Prep Date/Time: 09/26/18 10:06
Prep Initial Wt./Vol.: 73.602 g
Prep Extract Vol: 28.9738 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	7.49	J	10.4	3.33	ug/Kg	1		10/08/18 18:47
Ethylbenzene	7.07	J	20.8	6.49	ug/Kg	1		10/08/18 18:47
o-Xylene	143		20.8	6.49	ug/Kg	1		10/08/18 18:47
P & M -Xylene	82.8		41.6	12.5	ug/Kg	1		10/08/18 18:47
Toluene	20.6	J	20.8	6.49	ug/Kg	1		10/08/18 18:47
Xylenes (total)	226		62.4	19.0	ug/Kg	1		10/08/18 18:47
Surrogates								
1,4-Difluorobenzene (surr)	95.4		72-119		%	1		10/08/18 18:47

Batch Information

Analytical Batch: VFC14484
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/08/18 18:47
Container ID: 1185570005-B

Prep Batch: VXX33300
Prep Method: SW5035A
Prep Date/Time: 09/26/18 10:06
Prep Initial Wt./Vol.: 73.602 g
Prep Extract Vol: 28.9738 mL

Results of **TP3-2**

Client Sample ID: **TP3-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570006
Lab Project ID: 1185570

Collection Date: 09/26/18 11:34
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	5870		515	129	ug/Kg	20		10/03/18 14:26
2-Methylnaphthalene	5080		515	129	ug/Kg	20		10/03/18 14:26
Acenaphthene	258	U	515	129	ug/Kg	20		10/03/18 14:26
Acenaphthylene	258	U	515	129	ug/Kg	20		10/03/18 14:26
Anthracene	258	U	515	129	ug/Kg	20		10/03/18 14:26
Benzo(a)Anthracene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Benzo[a]pyrene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Benzo[b]Fluoranthene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Benzo[g,h,i]perylene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Benzo[k]fluoranthene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Chrysene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Dibenzo[a,h]anthracene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Fluoranthene	13.4	J	25.7	6.44	ug/Kg	1		10/02/18 17:48
Fluorene	259	J	515	129	ug/Kg	20		10/03/18 14:26
Indeno[1,2,3-c,d] pyrene	12.9	U	25.7	6.44	ug/Kg	1		10/02/18 17:48
Naphthalene	3180		412	103	ug/Kg	20		10/03/18 14:26
Phenanthrene	258	U	515	129	ug/Kg	20		10/03/18 14:26
Pyrene	18.2	J	25.7	6.44	ug/Kg	1		10/02/18 17:48
Surrogates								
2-Methylnaphthalene-d10 (surr)	87		58-103		%	20		10/03/18 14:26
Fluoranthene-d10 (surr)	66.1		54-113		%	1		10/02/18 17:48

Batch Information

Analytical Batch: XMS11126
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/03/18 14:26
Container ID: 1185570006-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.575 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11125
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/02/18 17:48
Container ID: 1185570006-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.575 g
Prep Extract Vol: 5 mL

Results of **TP3-2**

Client Sample ID: **TP3-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570006
Lab Project ID: 1185570

Collection Date: 09/26/18 11:34
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1580		20.4	6.31	mg/Kg	1		10/01/18 15:31
Surrogates								
5a Androstane (surr)	91.7		50-150		%	1		10/01/18 15:31

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 15:31
Container ID: 1185570006-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.452 g
Prep Extract Vol: 5 mL

Results of **TP3-2**

Client Sample ID: **TP3-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570006
Lab Project ID: 1185570

Collection Date: 09/26/18 11:34
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1140		42.7	12.8	mg/Kg	20		10/04/18 17:40
Surrogates								
4-Bromofluorobenzene (surr)	767	*	50-150		%	20		10/04/18 17:40

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 17:40
Container ID: 1185570006-B

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 09/26/18 11:34
Prep Initial Wt./Vol.: 65.641 g
Prep Extract Vol: 27.1211 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP3-2**

Client Sample ID: **TP3-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570006
Lab Project ID: 1185570

Collection Date: 09/26/18 11:34
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	171	U	342	106	ug/Kg	20		10/04/18 17:40
1,1,1-Trichloroethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,1,2,2-Tetrachloroethane	107	U	213	66.6	ug/Kg	20		10/04/18 17:40
1,1,2-Trichloroethane	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
1,1-Dichloroethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,1-Dichloroethene	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,1-Dichloropropene	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,2,3-Trichlorobenzene	427	U	854	256	ug/Kg	20		10/04/18 17:40
1,2,3-Trichloropropane	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,2,4-Trichlorobenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,2,4-Trimethylbenzene	115000		4270	1280	ug/Kg	100		10/04/18 18:49
1,2-Dibromo-3-chloropropane	855	U	1710	529	ug/Kg	20		10/04/18 17:40
1,2-Dibromoethane	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
1,2-Dichlorobenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,2-Dichloroethane	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
1,2-Dichloropropane	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
1,3,5-Trimethylbenzene	37300		427	133	ug/Kg	20		10/04/18 17:40
1,3-Dichlorobenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
1,3-Dichloropropane	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
1,4-Dichlorobenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
2,2-Dichloropropane	214	U	427	133	ug/Kg	20		10/04/18 17:40
2-Butanone (MEK)	2135	U	4270	1330	ug/Kg	20		10/04/18 17:40
2-Chlorotoluene	214	U	427	133	ug/Kg	20		10/04/18 17:40
2-Hexanone	855	U	1710	529	ug/Kg	20		10/04/18 17:40
4-Chlorotoluene	214	U	427	133	ug/Kg	20		10/04/18 17:40
4-Isopropyltoluene	4940		1710	427	ug/Kg	20		10/04/18 17:40
4-Methyl-2-pentanone (MIBK)	2135	U	4270	1330	ug/Kg	20		10/04/18 17:40
Acetone	2135	U	4270	1330	ug/Kg	20		10/04/18 17:40
Benzene	362		213	66.6	ug/Kg	20		10/04/18 17:40
Bromobenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
Bromochloromethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
Bromodichloromethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
Bromoform	214	U	427	133	ug/Kg	20		10/04/18 17:40
Bromomethane	1710	U	3420	1060	ug/Kg	20		10/04/18 17:40
Carbon disulfide	855	U	1710	529	ug/Kg	20		10/04/18 17:40
Carbon tetrachloride	107	U	213	66.6	ug/Kg	20		10/04/18 17:40
Chlorobenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40

Results of **TP3-2**

Client Sample ID: **TP3-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570006
Lab Project ID: 1185570

Collection Date: 09/26/18 11:34
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	1710	U	3420	1060	ug/Kg	20		10/04/18 17:40
Chloroform	214	U	427	133	ug/Kg	20		10/04/18 17:40
Chloromethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
cis-1,2-Dichloroethene	214	U	427	133	ug/Kg	20		10/04/18 17:40
cis-1,3-Dichloropropene	107	U	213	66.6	ug/Kg	20		10/04/18 17:40
Dibromochloromethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
Dibromomethane	214	U	427	133	ug/Kg	20		10/04/18 17:40
Dichlorodifluoromethane	427	U	854	256	ug/Kg	20		10/04/18 17:40
Ethylbenzene	2580		427	133	ug/Kg	20		10/04/18 17:40
Freon-113	855	U	1710	529	ug/Kg	20		10/04/18 17:40
Hexachlorobutadiene	171	U	342	106	ug/Kg	20		10/04/18 17:40
Isopropylbenzene (Cumene)	738		427	133	ug/Kg	20		10/04/18 17:40
Methylene chloride	855	U	1710	529	ug/Kg	20		10/04/18 17:40
Methyl-t-butyl ether	855	U	1710	529	ug/Kg	20		10/04/18 17:40
Naphthalene	4860		427	133	ug/Kg	20		10/04/18 17:40
n-Butylbenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
n-Propylbenzene	1010		427	133	ug/Kg	20		10/04/18 17:40
o-Xylene	90100		2130	666	ug/Kg	100		10/04/18 18:49
P & M -Xylene	179000		4270	1280	ug/Kg	100		10/04/18 18:49
sec-Butylbenzene	697		427	133	ug/Kg	20		10/04/18 17:40
Styrene	214	U	427	133	ug/Kg	20		10/04/18 17:40
tert-Butylbenzene	214	U	427	133	ug/Kg	20		10/04/18 17:40
Tetrachloroethene	107	U	213	66.6	ug/Kg	20		10/04/18 17:40
Toluene	28800		427	133	ug/Kg	20		10/04/18 17:40
trans-1,2-Dichloroethene	344	J	427	133	ug/Kg	20		10/04/18 17:40
trans-1,3-Dichloropropene	107	U	213	66.6	ug/Kg	20		10/04/18 17:40
Trichloroethene	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
Trichlorofluoromethane	427	U	854	256	ug/Kg	20		10/04/18 17:40
Vinyl acetate	855	U	1710	529	ug/Kg	20		10/04/18 17:40
Vinyl chloride	85.5	U	171	52.9	ug/Kg	20		10/04/18 17:40
Xylenes (total)	269000		6400	1950	ug/Kg	100		10/04/18 18:49
Surrogates								
1,2-Dichloroethane-D4 (surr)	92.4		71-136		%	20		10/04/18 17:40
4-Bromofluorobenzene (surr)	113		55-151		%	20		10/04/18 17:40
Toluene-d8 (surr)	104		85-116		%	20		10/04/18 17:40

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP3-2**

Client Sample ID: **TP3-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570006
Lab Project ID: 1185570

Collection Date: 09/26/18 11:34
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 17:40
Container ID: 1185570006-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 11:34
Prep Initial Wt./Vol.: 65.641 g
Prep Extract Vol: 27.1211 mL

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 18:49
Container ID: 1185570006-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 11:34
Prep Initial Wt./Vol.: 65.641 g
Prep Extract Vol: 27.1211 mL

Results of **TP3-29**

Client Sample ID: **TP3-29**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570007
Lab Project ID: 1185570

Collection Date: 09/26/18 13:37
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4550		254	63.6	ug/Kg	10		10/05/18 10:47
2-Methylnaphthalene	4180		254	63.6	ug/Kg	10		10/05/18 10:47
Acenaphthene	80.1		25.4	6.36	ug/Kg	1		10/02/18 18:49
Acenaphthylene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Anthracene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Benzo(a)Anthracene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Benzo[a]pyrene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Benzo[b]Fluoranthene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Benzo[g,h,i]perylene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Benzo[k]fluoranthene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Chrysene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Dibenzo[a,h]anthracene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Fluoranthene	11.0	J	25.4	6.36	ug/Kg	1		10/02/18 18:49
Fluorene	182		25.4	6.36	ug/Kg	1		10/02/18 18:49
Indeno[1,2,3-c,d] pyrene	12.7	U	25.4	6.36	ug/Kg	1		10/02/18 18:49
Naphthalene	2740		204	50.9	ug/Kg	10		10/05/18 10:47
Phenanthrene	132		25.4	6.36	ug/Kg	1		10/02/18 18:49
Pyrene	15.7	J	25.4	6.36	ug/Kg	1		10/02/18 18:49
Surrogates								
2-Methylnaphthalene-d10 (surr)	62		58-103		%	1		10/02/18 18:49
Fluoranthene-d10 (surr)	60		54-113		%	1		10/02/18 18:49

Batch Information

Analytical Batch: XMS11131
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/05/18 10:47
Container ID: 1185570007-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.93 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11125
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/02/18 18:49
Container ID: 1185570007-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.93 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP3-29**

Client Sample ID: **TP3-29**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570007
Lab Project ID: 1185570

Collection Date: 09/26/18 13:37
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1630		20.6	6.39	mg/Kg	1		10/01/18 15:41
Surrogates								
5a Androstane (surr)	93		50-150		%	1		10/01/18 15:41

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 15:41
Container ID: 1185570007-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.197 g
Prep Extract Vol: 5 mL

Results of **TP3-29**

Client Sample ID: **TP3-29**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570007
Lab Project ID: 1185570

Collection Date: 09/26/18 13:37
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	861		44.1	13.2	mg/Kg	20		10/04/18 17:58
Surrogates								
4-Bromofluorobenzene (surr)	636	*	50-150		%	20		10/04/18 17:58

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 17:58
Container ID: 1185570007-B

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 09/26/18 13:37
Prep Initial Wt./Vol.: 64.187 g
Prep Extract Vol: 27.3086 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP3-29**

Client Sample ID: **TP3-29**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570007
Lab Project ID: 1185570

Collection Date: 09/26/18 13:37
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	177	U	353	109	ug/Kg	20		10/04/18 17:57
1,1,1-Trichloroethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,1,2,2-Tetrachloroethane	111	U	221	68.8	ug/Kg	20		10/04/18 17:57
1,1,2-Trichloroethane	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
1,1-Dichloroethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,1-Dichloroethene	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,1-Dichloropropene	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,2,3-Trichlorobenzene	442	U	883	265	ug/Kg	20		10/04/18 17:57
1,2,3-Trichloropropane	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,2,4-Trichlorobenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,2,4-Trimethylbenzene	87300		4410	1320	ug/Kg	100		10/04/18 19:06
1,2-Dibromo-3-chloropropane	885	U	1770	547	ug/Kg	20		10/04/18 17:57
1,2-Dibromoethane	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
1,2-Dichlorobenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,2-Dichloroethane	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
1,2-Dichloropropane	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
1,3,5-Trimethylbenzene	30200		441	138	ug/Kg	20		10/04/18 17:57
1,3-Dichlorobenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
1,3-Dichloropropane	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
1,4-Dichlorobenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
2,2-Dichloropropane	221	U	441	138	ug/Kg	20		10/04/18 17:57
2-Butanone (MEK)	2205	U	4410	1380	ug/Kg	20		10/04/18 17:57
2-Chlorotoluene	221	U	441	138	ug/Kg	20		10/04/18 17:57
2-Hexanone	885	U	1770	547	ug/Kg	20		10/04/18 17:57
4-Chlorotoluene	221	U	441	138	ug/Kg	20		10/04/18 17:57
4-Isopropyltoluene	3860		1770	441	ug/Kg	20		10/04/18 17:57
4-Methyl-2-pentanone (MIBK)	2205	U	4410	1380	ug/Kg	20		10/04/18 17:57
Acetone	2205	U	4410	1380	ug/Kg	20		10/04/18 17:57
Benzene	227		221	68.8	ug/Kg	20		10/04/18 17:57
Bromobenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
Bromochloromethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
Bromodichloromethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
Bromoform	221	U	441	138	ug/Kg	20		10/04/18 17:57
Bromomethane	1765	U	3530	1090	ug/Kg	20		10/04/18 17:57
Carbon disulfide	885	U	1770	547	ug/Kg	20		10/04/18 17:57
Carbon tetrachloride	111	U	221	68.8	ug/Kg	20		10/04/18 17:57
Chlorobenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP3-29**

Client Sample ID: **TP3-29**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570007
Lab Project ID: 1185570

Collection Date: 09/26/18 13:37
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	1765	U	3530	1090	ug/Kg	20		10/04/18 17:57
Chloroform	221	U	441	138	ug/Kg	20		10/04/18 17:57
Chloromethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
cis-1,2-Dichloroethene	221	U	441	138	ug/Kg	20		10/04/18 17:57
cis-1,3-Dichloropropene	111	U	221	68.8	ug/Kg	20		10/04/18 17:57
Dibromochloromethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
Dibromomethane	221	U	441	138	ug/Kg	20		10/04/18 17:57
Dichlorodifluoromethane	442	U	883	265	ug/Kg	20		10/04/18 17:57
Ethylbenzene	1830		441	138	ug/Kg	20		10/04/18 17:57
Freon-113	885	U	1770	547	ug/Kg	20		10/04/18 17:57
Hexachlorobutadiene	177	U	353	109	ug/Kg	20		10/04/18 17:57
Isopropylbenzene (Cumene)	540		441	138	ug/Kg	20		10/04/18 17:57
Methylene chloride	885	U	1770	547	ug/Kg	20		10/04/18 17:57
Methyl-t-butyl ether	885	U	1770	547	ug/Kg	20		10/04/18 17:57
Naphthalene	3570		441	138	ug/Kg	20		10/04/18 17:57
n-Butylbenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
n-Propylbenzene	750		441	138	ug/Kg	20		10/04/18 17:57
o-Xylene	66400		2210	688	ug/Kg	100		10/04/18 19:06
P & M -Xylene	128000		4410	1320	ug/Kg	100		10/04/18 19:06
sec-Butylbenzene	495		441	138	ug/Kg	20		10/04/18 17:57
Styrene	221	U	441	138	ug/Kg	20		10/04/18 17:57
tert-Butylbenzene	221	U	441	138	ug/Kg	20		10/04/18 17:57
Tetrachloroethene	111	U	221	68.8	ug/Kg	20		10/04/18 17:57
Toluene	19800		441	138	ug/Kg	20		10/04/18 17:57
trans-1,2-Dichloroethene	221	U	441	138	ug/Kg	20		10/04/18 17:57
trans-1,3-Dichloropropene	111	U	221	68.8	ug/Kg	20		10/04/18 17:57
Trichloroethene	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
Trichlorofluoromethane	442	U	883	265	ug/Kg	20		10/04/18 17:57
Vinyl acetate	885	U	1770	547	ug/Kg	20		10/04/18 17:57
Vinyl chloride	88.5	U	177	54.7	ug/Kg	20		10/04/18 17:57
Xylenes (total)	194000		6620	2010	ug/Kg	100		10/04/18 19:06
Surrogates								
1,2-Dichloroethane-D4 (surr)	89.9		71-136		%	20		10/04/18 17:57
4-Bromofluorobenzene (surr)	108		55-151		%	20		10/04/18 17:57
Toluene-d8 (surr)	104		85-116		%	20		10/04/18 17:57

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP3-29**

Client Sample ID: **TP3-29**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570007
Lab Project ID: 1185570

Collection Date: 09/26/18 13:37
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.4
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 17:57
Container ID: 1185570007-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 13:37
Prep Initial Wt./Vol.: 64.187 g
Prep Extract Vol: 27.3086 mL

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 19:06
Container ID: 1185570007-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 13:37
Prep Initial Wt./Vol.: 64.187 g
Prep Extract Vol: 27.3086 mL

Results of **TP4-4**

Client Sample ID: **TP4-4**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570008
Lab Project ID: 1185570

Collection Date: 09/26/18 12:53
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):95.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10.4	U	20.8	6.45	mg/Kg	1		10/01/18 15:51
Surrogates								
5a Androstane (surr)	94.8		50-150		%	1		10/01/18 15:51

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 15:51
Container ID: 1185570008-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.087 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP4-4**

Client Sample ID: **TP4-4**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570008
Lab Project ID: 1185570

Collection Date: 09/26/18 12:53
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):95.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.830	U	1.66	0.498	mg/Kg	1		10/04/18 19:10
Surrogates								
4-Bromofluorobenzene (surr)	72.1		50-150		%	1		10/04/18 19:10

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 19:10
Container ID: 1185570008-B

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 09/26/18 12:53
Prep Initial Wt./Vol.: 90.035 g
Prep Extract Vol: 28.6823 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	4.15	U	8.30	2.66	ug/Kg	1		10/04/18 19:10
Ethylbenzene	8.30	U	16.6	5.18	ug/Kg	1		10/04/18 19:10
o-Xylene	8.30	U	16.6	5.18	ug/Kg	1		10/04/18 19:10
P & M -Xylene	16.6	U	33.2	9.96	ug/Kg	1		10/04/18 19:10
Toluene	8.30	U	16.6	5.18	ug/Kg	1		10/04/18 19:10
Xylenes (total)	24.9	U	49.8	15.1	ug/Kg	1		10/04/18 19:10
Surrogates								
1,4-Difluorobenzene (surr)	96.3		72-119		%	1		10/04/18 19:10

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/04/18 19:10
Container ID: 1185570008-B

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 09/26/18 12:53
Prep Initial Wt./Vol.: 90.035 g
Prep Extract Vol: 28.6823 mL

Results of **TP5-2**

Client Sample ID: **TP5-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570009
Lab Project ID: 1185570

Collection Date: 09/26/18 14:06
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3710		21.0	6.51	mg/Kg	1		10/01/18 16:02
Surrogates								
5a Androstane (surr)	90.4		50-150		%	1		10/01/18 16:02

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 16:02
Container ID: 1185570009-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.026 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP5-2**

Client Sample ID: **TP5-2**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570009
Lab Project ID: 1185570

Collection Date: 09/26/18 14:06
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):95.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	59.2		1.92	0.577	mg/Kg	1		10/08/18 19:40
Surrogates								
4-Bromofluorobenzene (surr)	333	*	50-150		%	1		10/08/18 19:40

Batch Information

Analytical Batch: VFC14484
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/18 19:40
Container ID: 1185570009-B

Prep Batch: VXX33300
Prep Method: SW5035A
Prep Date/Time: 09/26/18 14:06
Prep Initial Wt./Vol.: 78.607 g
Prep Extract Vol: 28.795 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.77 J		9.62	3.08	ug/Kg	1		10/08/18 19:40
Ethylbenzene	13.5 J		19.2	6.00	ug/Kg	1		10/08/18 19:40
o-Xylene	311		19.2	6.00	ug/Kg	1		10/08/18 19:40
P & M -Xylene	71.6		38.5	11.5	ug/Kg	1		10/08/18 19:40
Toluene	39.8		19.2	6.00	ug/Kg	1		10/08/18 19:40
Xylenes (total)	382		57.7	17.6	ug/Kg	1		10/08/18 19:40
Surrogates								
1,4-Difluorobenzene (surr)	81.8		72-119		%	1		10/08/18 19:40

Batch Information

Analytical Batch: VFC14484
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/08/18 19:40
Container ID: 1185570009-B

Prep Batch: VXX33300
Prep Method: SW5035A
Prep Date/Time: 09/26/18 14:06
Prep Initial Wt./Vol.: 78.607 g
Prep Extract Vol: 28.795 mL

Results of **TP5-3**

Client Sample ID: **TP5-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570010
Lab Project ID: 1185570

Collection Date: 09/26/18 14:05
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):93.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	842		21.2	6.58	mg/Kg	1		10/01/18 16:12
Surrogates								
5a Androstane (surr)	102		50-150		%	1		10/01/18 16:12

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 16:12
Container ID: 1185570010-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.174 g
Prep Extract Vol: 5 mL

Results of **TP5-3**

Client Sample ID: **TP5-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570010
Lab Project ID: 1185570

Collection Date: 09/26/18 14:05
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):93.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.57		2.17	0.650	mg/Kg	1		10/04/18 23:20
Surrogates								
4-Bromofluorobenzene (surr)	84.9		50-150		%	1		10/04/18 23:20

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/04/18 23:20
Container ID: 1185570010-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 14:05
Prep Initial Wt./Vol.: 73.145 g
Prep Extract Vol: 29.6634 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.41	J	10.8	3.47	ug/Kg	1		10/04/18 23:20
Ethylbenzene	10.9	U	21.7	6.76	ug/Kg	1		10/04/18 23:20
o-Xylene	28.4		21.7	6.76	ug/Kg	1		10/04/18 23:20
P & M -Xylene	36.2	J	43.3	13.0	ug/Kg	1		10/04/18 23:20
Toluene	48.7		21.7	6.76	ug/Kg	1		10/04/18 23:20
Xylenes (total)	64.5	J	65.0	19.8	ug/Kg	1		10/04/18 23:20
Surrogates								
1,4-Difluorobenzene (surr)	91.4		72-119		%	1		10/04/18 23:20

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/04/18 23:20
Container ID: 1185570010-B

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 09/26/18 14:05
Prep Initial Wt./Vol.: 73.145 g
Prep Extract Vol: 29.6634 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **SS1**

Client Sample ID: **SS1**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570011
Lab Project ID: 1185570

Collection Date: 09/26/18 14:12
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):91.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	2520		21.7	6.72	mg/Kg	1		10/01/18 16:23
Surrogates								
5a Androstane (surr)	92.6		50-150		%	1		10/01/18 16:23

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 16:23
Container ID: 1185570011-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.295 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **SS1**

Client Sample ID: **SS1**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570011
Lab Project ID: 1185570

Collection Date: 09/26/18 14:12
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):91.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.23	U	2.46	0.737	mg/Kg	1		10/05/18 14:30
Surrogates								
4-Bromofluorobenzene (surr)	68.9		50-150		%	1		10/05/18 14:30

Batch Information

Analytical Batch: VFC14479
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/05/18 14:30
Container ID: 1185570011-B

Prep Batch: VXX33285
Prep Method: SW5035A
Prep Date/Time: 09/26/18 14:12
Prep Initial Wt./Vol.: 68.846 g
Prep Extract Vol: 30.9151 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	6.15	U	12.3	3.93	ug/Kg	1		10/05/18 14:30
Ethylbenzene	12.3	U	24.6	7.66	ug/Kg	1		10/05/18 14:30
o-Xylene	9.58	J	24.6	7.66	ug/Kg	1		10/05/18 14:30
P & M -Xylene	24.6	U	49.1	14.7	ug/Kg	1		10/05/18 14:30
Toluene	12.3	U	24.6	7.66	ug/Kg	1		10/05/18 14:30
Xylenes (total)	36.9	U	73.7	22.4	ug/Kg	1		10/05/18 14:30
Surrogates								
1,4-Difluorobenzene (surr)	104		72-119		%	1		10/05/18 14:30

Batch Information

Analytical Batch: VFC14479
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/05/18 14:30
Container ID: 1185570011-B

Prep Batch: VXX33285
Prep Method: SW5035A
Prep Date/Time: 09/26/18 14:12
Prep Initial Wt./Vol.: 68.846 g
Prep Extract Vol: 30.9151 mL

Results of **TP6-1**

Client Sample ID: **TP6-1**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570012
Lab Project ID: 1185570

Collection Date: 09/26/18 15:57
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):93.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	5230		85.3	26.4	mg/Kg	4		10/01/18 16:54
Surrogates								
5a Androstane (surr)	96.2		50-150		%	4		10/01/18 16:54

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 16:54
Container ID: 1185570012-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.096 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP6-1**

Client Sample ID: **TP6-1**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570012
Lab Project ID: 1185570

Collection Date: 09/26/18 15:57
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):93.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	76.3		2.21	0.664	mg/Kg	1		10/05/18 14:48
Surrogates								
4-Bromofluorobenzene (surr)	188	*	50-150		%	1		10/05/18 14:48

Batch Information

Analytical Batch: VFC14479
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/05/18 14:48
Container ID: 1185570012-B

Prep Batch: VXX33285
Prep Method: SW5035A
Prep Date/Time: 09/26/18 15:57
Prep Initial Wt./Vol.: 71.613 g
Prep Extract Vol: 29.6321 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	383		11.1	3.54	ug/Kg	1		10/05/18 14:48
Ethylbenzene	24.3		22.1	6.90	ug/Kg	1		10/05/18 14:48
o-Xylene	267		22.1	6.90	ug/Kg	1		10/05/18 14:48
P & M -Xylene	147		44.2	13.3	ug/Kg	1		10/05/18 14:48
Toluene	52.6		22.1	6.90	ug/Kg	1		10/05/18 14:48
Xylenes (total)	414		66.4	20.2	ug/Kg	1		10/05/18 14:48
Surrogates								
1,4-Difluorobenzene (surr)	100		72-119		%	1		10/05/18 14:48

Batch Information

Analytical Batch: VFC14479
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/05/18 14:48
Container ID: 1185570012-B

Prep Batch: VXX33285
Prep Method: SW5035A
Prep Date/Time: 09/26/18 15:57
Prep Initial Wt./Vol.: 71.613 g
Prep Extract Vol: 29.6321 mL

Results of **TP6-3**

Client Sample ID: **TP6-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570013
Lab Project ID: 1185570

Collection Date: 09/26/18 15:49
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	1500		258	64.5	ug/Kg	10		10/05/18 11:08
2-Methylnaphthalene	2980		258	64.5	ug/Kg	10		10/05/18 11:08
Acenaphthene	35.8		25.8	6.45	ug/Kg	1		10/02/18 19:10
Acenaphthylene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Anthracene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Benzo(a)Anthracene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Benzo[a]pyrene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Benzo[b]Fluoranthene	7.74	J	25.8	6.45	ug/Kg	1		10/02/18 19:10
Benzo[g,h,i]perylene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Benzo[k]fluoranthene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Chrysene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Dibenzo[a,h]anthracene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Fluoranthene	13.9	J	25.8	6.45	ug/Kg	1		10/02/18 19:10
Fluorene	97.4		25.8	6.45	ug/Kg	1		10/02/18 19:10
Indeno[1,2,3-c,d] pyrene	12.9	U	25.8	6.45	ug/Kg	1		10/02/18 19:10
Naphthalene	4320		206	51.6	ug/Kg	10		10/05/18 11:08
Phenanthrene	92.4		25.8	6.45	ug/Kg	1		10/02/18 19:10
Pyrene	18.7	J	25.8	6.45	ug/Kg	1		10/02/18 19:10
Surrogates								
2-Methylnaphthalene-d10 (surr)	70.8		58-103		%	1		10/02/18 19:10
Fluoranthene-d10 (surr)	63.7		54-113		%	1		10/02/18 19:10

Batch Information

Analytical Batch: XMS11131
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/05/18 11:08
Container ID: 1185570013-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.516 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11125
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/02/18 19:10
Container ID: 1185570013-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.516 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP6-3**

Client Sample ID: **TP6-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570013
Lab Project ID: 1185570

Collection Date: 09/26/18 15:49
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1020		20.6	6.39	mg/Kg	1		10/01/18 16:33
Surrogates								
5a Androstane (surr)	94.4		50-150		%	1		10/01/18 16:33

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 16:33
Container ID: 1185570013-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.084 g
Prep Extract Vol: 5 mL

Results of **TP6-3**

Client Sample ID: **TP6-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570013
Lab Project ID: 1185570

Collection Date: 09/26/18 15:49
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1820		111	33.4	mg/Kg	50		10/09/18 02:49
Surrogates								
4-Bromofluorobenzene (surr)	991	*	50-150		%	50		10/09/18 02:49

Batch Information

Analytical Batch: VFC14484
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/09/18 02:49
Container ID: 1185570013-B

Prep Batch: VXX33301
Prep Method: SW5035A
Prep Date/Time: 09/26/18 15:49
Prep Initial Wt./Vol.: 62.605 g
Prep Extract Vol: 27.006 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP6-3**

Client Sample ID: **TP6-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570013
Lab Project ID: 1185570

Collection Date: 09/26/18 15:49
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	179	U	357	111	ug/Kg	20		10/04/18 18:14
1,1,1-Trichloroethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,1,2,2-Tetrachloroethane	112	U	223	69.5	ug/Kg	20		10/04/18 18:14
1,1,2-Trichloroethane	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
1,1-Dichloroethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,1-Dichloroethene	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,1-Dichloropropene	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,2,3-Trichlorobenzene	446	U	891	267	ug/Kg	20		10/04/18 18:14
1,2,3-Trichloropropane	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,2,4-Trichlorobenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,2,4-Trimethylbenzene	168000		4460	1340	ug/Kg	100		10/04/18 19:23
1,2-Dibromo-3-chloropropane	890	U	1780	553	ug/Kg	20		10/04/18 18:14
1,2-Dibromoethane	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
1,2-Dichlorobenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,2-Dichloroethane	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
1,2-Dichloropropane	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
1,3,5-Trimethylbenzene	35700		446	139	ug/Kg	20		10/04/18 18:14
1,3-Dichlorobenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
1,3-Dichloropropane	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
1,4-Dichlorobenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
2,2-Dichloropropane	223	U	446	139	ug/Kg	20		10/04/18 18:14
2-Butanone (MEK)	2230	U	4460	1390	ug/Kg	20		10/04/18 18:14
2-Chlorotoluene	223	U	446	139	ug/Kg	20		10/04/18 18:14
2-Hexanone	890	U	1780	553	ug/Kg	20		10/04/18 18:14
4-Chlorotoluene	223	U	446	139	ug/Kg	20		10/04/18 18:14
4-Isopropyltoluene	3060		1780	446	ug/Kg	20		10/04/18 18:14
4-Methyl-2-pentanone (MIBK)	2230	U	4460	1390	ug/Kg	20		10/04/18 18:14
Acetone	2230	U	4460	1390	ug/Kg	20		10/04/18 18:14
Benzene	674		223	69.5	ug/Kg	20		10/04/18 18:14
Bromobenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
Bromochloromethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
Bromodichloromethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
Bromoform	223	U	446	139	ug/Kg	20		10/04/18 18:14
Bromomethane	1785	U	3570	1110	ug/Kg	20		10/04/18 18:14
Carbon disulfide	890	U	1780	553	ug/Kg	20		10/04/18 18:14
Carbon tetrachloride	112	U	223	69.5	ug/Kg	20		10/04/18 18:14
Chlorobenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP6-3**

Client Sample ID: **TP6-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570013
Lab Project ID: 1185570

Collection Date: 09/26/18 15:49
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	1785	U	3570	1110	ug/Kg	20		10/04/18 18:14
Chloroform	223	U	446	139	ug/Kg	20		10/04/18 18:14
Chloromethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
cis-1,2-Dichloroethene	223	U	446	139	ug/Kg	20		10/04/18 18:14
cis-1,3-Dichloropropene	112	U	223	69.5	ug/Kg	20		10/04/18 18:14
Dibromochloromethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
Dibromomethane	223	U	446	139	ug/Kg	20		10/04/18 18:14
Dichlorodifluoromethane	446	U	891	267	ug/Kg	20		10/04/18 18:14
Ethylbenzene	4960		446	139	ug/Kg	20		10/04/18 18:14
Freon-113	890	U	1780	553	ug/Kg	20		10/04/18 18:14
Hexachlorobutadiene	179	U	357	111	ug/Kg	20		10/04/18 18:14
Isopropylbenzene (Cumene)	2320		446	139	ug/Kg	20		10/04/18 18:14
Methylene chloride	890	U	1780	553	ug/Kg	20		10/04/18 18:14
Methyl-t-butyl ether	890	U	1780	553	ug/Kg	20		10/04/18 18:14
Naphthalene	4950		446	139	ug/Kg	20		10/04/18 18:14
n-Butylbenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
n-Propylbenzene	4640		446	139	ug/Kg	20		10/04/18 18:14
o-Xylene	181000		2230	695	ug/Kg	100		10/04/18 19:23
P & M -Xylene	395000		4460	1340	ug/Kg	100		10/04/18 19:23
sec-Butylbenzene	934		446	139	ug/Kg	20		10/04/18 18:14
Styrene	223	U	446	139	ug/Kg	20		10/04/18 18:14
tert-Butylbenzene	223	U	446	139	ug/Kg	20		10/04/18 18:14
Tetrachloroethene	112	U	223	69.5	ug/Kg	20		10/04/18 18:14
Toluene	72500		2230	695	ug/Kg	100		10/04/18 19:23
trans-1,2-Dichloroethene	223	U	446	139	ug/Kg	20		10/04/18 18:14
trans-1,3-Dichloropropene	112	U	223	69.5	ug/Kg	20		10/04/18 18:14
Trichloroethene	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
Trichlorofluoromethane	446	U	891	267	ug/Kg	20		10/04/18 18:14
Vinyl acetate	890	U	1780	553	ug/Kg	20		10/04/18 18:14
Vinyl chloride	89.0	U	178	55.3	ug/Kg	20		10/04/18 18:14
Xylenes (total)	576000		6680	2030	ug/Kg	100		10/04/18 19:23
Surrogates								
1,2-Dichloroethane-D4 (surr)	91.9		71-136		%	20		10/04/18 18:14
4-Bromofluorobenzene (surr)	73.7		55-151		%	20		10/04/18 18:14
Toluene-d8 (surr)	102		85-116		%	20		10/04/18 18:14

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP6-3**

Client Sample ID: **TP6-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570013
Lab Project ID: 1185570

Collection Date: 09/26/18 15:49
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):96.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 18:14
Container ID: 1185570013-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 15:49
Prep Initial Wt./Vol.: 62.605 g
Prep Extract Vol: 27.006 mL

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 19:23
Container ID: 1185570013-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 15:49
Prep Initial Wt./Vol.: 62.605 g
Prep Extract Vol: 27.006 mL

Results of **TP7-1**

Client Sample ID: **TP7-1**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570014
Lab Project ID: 1185570

Collection Date: 09/26/18 16:55
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):91.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	4020		21.7	6.71	mg/Kg	1		10/01/18 16:44
Surrogates								
5a Androstane (surr)	92.7		50-150		%	1		10/01/18 16:44

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 16:44
Container ID: 1185570014-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.306 g
Prep Extract Vol: 5 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP7-1**

Client Sample ID: **TP7-1**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570014
Lab Project ID: 1185570

Collection Date: 09/26/18 16:55
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):91.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	34.2		2.24	0.672	mg/Kg	1		10/08/18 00:42
Surrogates								
4-Bromofluorobenzene (surr)	191	*	50-150		%	1		10/08/18 00:42

Batch Information

Analytical Batch: VFC14483
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/18 00:42
Container ID: 1185570014-B

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 16:55
Prep Initial Wt./Vol.: 77.156 g
Prep Extract Vol: 31.6192 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	5.60	U	11.2	3.59	ug/Kg	1		10/08/18 00:42
Ethylbenzene	43.0		22.4	6.99	ug/Kg	1		10/08/18 00:42
o-Xylene	1010		22.4	6.99	ug/Kg	1		10/08/18 00:42
P & M -Xylene	269		44.8	13.4	ug/Kg	1		10/08/18 00:42
Toluene	9.86	J	22.4	6.99	ug/Kg	1		10/08/18 00:42
Xylenes (total)	1280		67.2	20.4	ug/Kg	1		10/08/18 00:42
Surrogates								
1,4-Difluorobenzene (surr)	93.7		72-119		%	1		10/08/18 00:42

Batch Information

Analytical Batch: VFC14483
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/08/18 00:42
Container ID: 1185570014-B

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 16:55
Prep Initial Wt./Vol.: 77.156 g
Prep Extract Vol: 31.6192 mL

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	10400		540	135	ug/Kg	20		10/05/18 11:28
2-Methylnaphthalene	14000		1080	270	ug/Kg	40		10/08/18 15:42
Acenaphthene	151		27.0	6.75	ug/Kg	1		10/02/18 19:30
Acenaphthylene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Anthracene	23.3 J		27.0	6.75	ug/Kg	1		10/02/18 19:30
Benzo(a)Anthracene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Benzo[a]pyrene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Benzo[b]Fluoranthene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Benzo[g,h,i]perylene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Benzo[k]fluoranthene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Chrysene	8.01 J		27.0	6.75	ug/Kg	1		10/02/18 19:30
Dibenzo[a,h]anthracene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Fluoranthene	28.1		27.0	6.75	ug/Kg	1		10/02/18 19:30
Fluorene	299		27.0	6.75	ug/Kg	1		10/02/18 19:30
Indeno[1,2,3-c,d] pyrene	13.5 U		27.0	6.75	ug/Kg	1		10/02/18 19:30
Naphthalene	7070		432	108	ug/Kg	20		10/05/18 11:28
Phenanthrene	194		27.0	6.75	ug/Kg	1		10/02/18 19:30
Pyrene	26.4 J		27.0	6.75	ug/Kg	1		10/02/18 19:30
Surrogates								
2-Methylnaphthalene-d10 (surr)	39.3	*	58-103		%	1		10/02/18 19:30
Fluoranthene-d10 (surr)	30.8	*	54-113		%	1		10/02/18 19:30

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Polynuclear Aromatics GC/MS**

Batch Information

Analytical Batch: XMS11131
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/05/18 11:28
Container ID: 1185570015-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.591 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11136
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/08/18 15:42
Container ID: 1185570015-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.591 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS11125
Analytical Method: 8270D SIM (PAH)
Analyst: BMZ
Analytical Date/Time: 10/02/18 19:30
Container ID: 1185570015-A

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 09/29/18 10:44
Prep Initial Wt./Vol.: 22.591 g
Prep Extract Vol: 5 mL

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3580		85.7	26.6	mg/Kg	4		10/01/18 17:04
Surrogates								
5a Androstane (surr)	93.1		50-150		%	4		10/01/18 17:04

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Analyst: VDL
Analytical Date/Time: 10/01/18 17:04
Container ID: 1185570015-A

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 09/29/18 08:51
Prep Initial Wt./Vol.: 30.372 g
Prep Extract Vol: 5 mL

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	654		23.3	7.00	mg/Kg	10		10/08/18 01:18
Surrogates								
4-Bromofluorobenzene (surr)	1070	*	50-150		%	10		10/08/18 01:18

Batch Information

Analytical Batch: VFC14483
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/08/18 01:18
Container ID: 1185570015-B

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 16:45
Prep Initial Wt./Vol.: 71.022 g
Prep Extract Vol: 30.5594 mL

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	187	U	373	116	ug/Kg	20		10/04/18 18:31
1,1,1-Trichloroethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,1,2,2-Tetrachloroethane	117	U	233	72.8	ug/Kg	20		10/04/18 18:31
1,1,2-Trichloroethane	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
1,1-Dichloroethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,1-Dichloroethene	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,1-Dichloropropene	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,2,3-Trichlorobenzene	467	U	934	280	ug/Kg	20		10/04/18 18:31
1,2,3-Trichloropropane	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,2,4-Trichlorobenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,2,4-Trimethylbenzene	104000		4670	1400	ug/Kg	100		10/04/18 19:40
1,2-Dibromo-3-chloropropane	935	U	1870	579	ug/Kg	20		10/04/18 18:31
1,2-Dibromoethane	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
1,2-Dichlorobenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,2-Dichloroethane	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
1,2-Dichloropropane	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
1,3,5-Trimethylbenzene	61100		2330	728	ug/Kg	100		10/04/18 19:40
1,3-Dichlorobenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
1,3-Dichloropropane	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
1,4-Dichlorobenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
2,2-Dichloropropane	234	U	467	146	ug/Kg	20		10/04/18 18:31
2-Butanone (MEK)	2335	U	4670	1460	ug/Kg	20		10/04/18 18:31
2-Chlorotoluene	234	U	467	146	ug/Kg	20		10/04/18 18:31
2-Hexanone	935	U	1870	579	ug/Kg	20		10/04/18 18:31
4-Chlorotoluene	234	U	467	146	ug/Kg	20		10/04/18 18:31
4-Isopropyltoluene	5280		1870	467	ug/Kg	20		10/04/18 18:31
4-Methyl-2-pentanone (MIBK)	2335	U	4670	1460	ug/Kg	20		10/04/18 18:31
Acetone	2335	U	4670	1460	ug/Kg	20		10/04/18 18:31
Benzene	117	U	233	72.8	ug/Kg	20		10/04/18 18:31
Bromobenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
Bromochloromethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
Bromodichloromethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
Bromoform	234	U	467	146	ug/Kg	20		10/04/18 18:31
Bromomethane	1865	U	3730	1160	ug/Kg	20		10/04/18 18:31
Carbon disulfide	935	U	1870	579	ug/Kg	20		10/04/18 18:31
Carbon tetrachloride	117	U	233	72.8	ug/Kg	20		10/04/18 18:31
Chlorobenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	1865	U	3730	1160	ug/Kg	20		10/04/18 18:31
Chloroform	234	U	467	146	ug/Kg	20		10/04/18 18:31
Chloromethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
cis-1,2-Dichloroethene	234	U	467	146	ug/Kg	20		10/04/18 18:31
Ethylbenzene	1690		467	146	ug/Kg	20		10/04/18 18:31
cis-1,3-Dichloropropene	117	U	233	72.8	ug/Kg	20		10/04/18 18:31
Dibromochloromethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
Dibromomethane	234	U	467	146	ug/Kg	20		10/04/18 18:31
Dichlorodifluoromethane	467	U	934	280	ug/Kg	20		10/04/18 18:31
Freon-113	935	U	1870	579	ug/Kg	20		10/04/18 18:31
Hexachlorobutadiene	187	U	373	116	ug/Kg	20		10/04/18 18:31
Isopropylbenzene (Cumene)	366	J	467	146	ug/Kg	20		10/04/18 18:31
Methylene chloride	935	U	1870	579	ug/Kg	20		10/04/18 18:31
Methyl-t-butyl ether	935	U	1870	579	ug/Kg	20		10/04/18 18:31
Naphthalene	8480		467	146	ug/Kg	20		10/04/18 18:31
n-Butylbenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
n-Propylbenzene	439	J	467	146	ug/Kg	20		10/04/18 18:31
o-Xylene	98600		2330	728	ug/Kg	100		10/04/18 19:40
P & M -Xylene	94900		4670	1400	ug/Kg	100		10/04/18 19:40
sec-Butylbenzene	318	J	467	146	ug/Kg	20		10/04/18 18:31
Styrene	234	U	467	146	ug/Kg	20		10/04/18 18:31
tert-Butylbenzene	234	U	467	146	ug/Kg	20		10/04/18 18:31
Tetrachloroethene	117	U	233	72.8	ug/Kg	20		10/04/18 18:31
Toluene	3950		467	146	ug/Kg	20		10/04/18 18:31
trans-1,2-Dichloroethene	234	U	467	146	ug/Kg	20		10/04/18 18:31
trans-1,3-Dichloropropene	117	U	233	72.8	ug/Kg	20		10/04/18 18:31
Trichloroethene	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
Trichlorofluoromethane	467	U	934	280	ug/Kg	20		10/04/18 18:31
Vinyl acetate	935	U	1870	579	ug/Kg	20		10/04/18 18:31
Vinyl chloride	93.5	U	187	57.9	ug/Kg	20		10/04/18 18:31
Xylenes (total)	194000		7000	2130	ug/Kg	100		10/04/18 19:40
Surrogates								
1,2-Dichloroethane-D4 (surr)	94.9		71-136		%	20		10/04/18 18:31
4-Bromofluorobenzene (surr)	135		55-151		%	20		10/04/18 18:31
Toluene-d8 (surr)	101		85-116		%	20		10/04/18 18:31

Print Date: 10/16/2018 9:40:13AM

J flagging is activated

Results of **TP7-3**

Client Sample ID: **TP7-3**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570015
Lab Project ID: 1185570

Collection Date: 09/26/18 16:45
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):92.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 18:31
Container ID: 1185570015-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 16:45
Prep Initial Wt./Vol.: 71.022 g
Prep Extract Vol: 30.5594 mL

Analytical Batch: VMS18409
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 10/04/18 19:40
Container ID: 1185570015-B

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 09/26/18 16:45
Prep Initial Wt./Vol.: 71.022 g
Prep Extract Vol: 30.5594 mL

Results of **Trip Blank 01**

Client Sample ID: **Trip Blank 01**
Client Project ID: **Shishmaref Native Store**
Lab Sample ID: 1185570016
Lab Project ID: 1185570

Collection Date: 09/26/18 11:11
Received Date: 09/28/18 13:51
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.25	U	2.50	0.751	mg/Kg	1		10/07/18 22:55
Surrogates								
4-Bromofluorobenzene (surr)	63.4		50-150		%	1		10/07/18 22:55

Batch Information

Analytical Batch: VFC14483
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 10/07/18 22:55
Container ID: 1185570016-A

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 11:11
Prep Initial Wt./Vol.: 49.901 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Ethylbenzene	12.5	U	25.0	7.82	ug/Kg	1		10/07/18 22:55
Benzene	6.25	U	12.5	4.01	ug/Kg	1		10/07/18 22:55
o-Xylene	12.5	U	25.0	7.82	ug/Kg	1		10/07/18 22:55
P & M -Xylene	25.1	U	50.1	15.0	ug/Kg	1		10/07/18 22:55
Toluene	12.5	U	25.0	7.82	ug/Kg	1		10/07/18 22:55
Xylenes (total)	37.5	U	75.1	22.8	ug/Kg	1		10/07/18 22:55
Surrogates								
1,4-Difluorobenzene (surr)	95		72-119		%	1		10/07/18 22:55

Batch Information

Analytical Batch: VFC14483
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 10/07/18 22:55
Container ID: 1185570016-A

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 09/26/18 11:11
Prep Initial Wt./Vol.: 49.901 g
Prep Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1786986 [SPT/10634]
Blank Lab ID: 1479383

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570001, 1185570002, 1185570003, 1185570004, 1185570005, 1185570006, 1185570007, 1185570008, 1185570009, 1185570010, 1185570011, 1185570012, 1185570013, 1185570014, 1185570015

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10634
Analytical Method: SM21 2540G
Instrument:
Analyst: FGL
Analytical Date/Time: 9/29/2018 3:24:00PM

Duplicate Sample Summary

Original Sample ID: 1185570001
Duplicate Sample ID: 1479384

Analysis Date: 09/29/2018 15:24
Matrix: Soil/Solid (dry weight)

QC for Samples:

1185570001, 1185570002, 1185570003, 1185570004, 1185570005, 1185570006, 1185570007, 1185570008, 1185570009, 1185570010, 1185570011

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	96.8	96.7	%	0.03	(< 15)

Batch Information

Analytical Batch: SPT10634
Analytical Method: SM21 2540G
Instrument:
Analyst: FGL

Print Date: 10/16/2018 9:40:17AM

Duplicate Sample Summary

Original Sample ID: 1185570011
Duplicate Sample ID: 1479385

Analysis Date: 09/29/2018 15:24
Matrix: Soil/Solid (dry weight)

QC for Samples:

1185570002, 1185570003, 1185570004, 1185570005, 1185570006, 1185570007, 1185570008, 1185570009, 1185570010, 1185570011, 1185570012, 1185570013, 1185570014, 1185570015

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	91.4	91.9	%	0.53	(< 15)

Batch Information

Analytical Batch: SPT10634
Analytical Method: SM21 2540G
Instrument:
Analyst: FGL

Print Date: 10/16/2018 9:40:17AM

Method Blank

Blank ID: MB for HBN 1787256 [VXX/33267]
Blank Lab ID: 1480608

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	10.0U	20.0	6.20	ug/Kg
1,1,1-Trichloroethane	12.5U	25.0	7.80	ug/Kg
1,1,2,2-Tetrachloroethane	6.25U	12.5	3.90	ug/Kg
1,1,2-Trichloroethane	5.00U	10.0	3.10	ug/Kg
1,1-Dichloroethane	12.5U	25.0	7.80	ug/Kg
1,1-Dichloroethene	12.5U	25.0	7.80	ug/Kg
1,1-Dichloropropene	12.5U	25.0	7.80	ug/Kg
1,2,3-Trichlorobenzene	25.0U	50.0	15.0	ug/Kg
1,2,3-Trichloropropane	12.5U	25.0	7.80	ug/Kg
1,2,4-Trichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/Kg
1,2-Dibromo-3-chloropropane	50.0U	100	31.0	ug/Kg
1,2-Dibromoethane	5.00U	10.0	3.10	ug/Kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,2-Dichloroethane	5.00U	10.0	3.10	ug/Kg
1,2-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
1,3-Dichloropropane	5.00U	10.0	3.10	ug/Kg
1,4-Dichlorobenzene	12.5U	25.0	7.80	ug/Kg
2,2-Dichloropropane	12.5U	25.0	7.80	ug/Kg
2-Butanone (MEK)	125U	250	78.0	ug/Kg
2-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
2-Hexanone	50.0U	100	31.0	ug/Kg
4-Chlorotoluene	12.5U	25.0	7.80	ug/Kg
4-Isopropyltoluene	50.0U	100	25.0	ug/Kg
4-Methyl-2-pentanone (MIBK)	125U	250	78.0	ug/Kg
Acetone	125U	250	78.0	ug/Kg
Benzene	6.25U	12.5	3.90	ug/Kg
Bromobenzene	12.5U	25.0	7.80	ug/Kg
Bromochloromethane	12.5U	25.0	7.80	ug/Kg
Bromodichloromethane	12.5U	25.0	7.80	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Bromomethane	100U	200	62.0	ug/Kg
Carbon disulfide	50.0U	100	31.0	ug/Kg
Carbon tetrachloride	6.25U	12.5	3.90	ug/Kg
Chlorobenzene	12.5U	25.0	7.80	ug/Kg
Chloroethane	100U	200	62.0	ug/Kg

Method Blank

Blank ID: MB for HBN 1787256 [VXX/33267]
Blank Lab ID: 1480608

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloroform	12.5U	25.0	7.80	ug/Kg
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	10.0U	20.0	6.20	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Trichloroethene	5.00U	10.0	3.10	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	103	71-136		%
4-Bromofluorobenzene (surr)	104	55-151		%
Toluene-d8 (surr)	105	85-116		%

Method Blank

Blank ID: MB for HBN 1787256 [VXX/33267]
Blank Lab ID: 1480608

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS18409
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: NRO
Analytical Date/Time: 10/4/2018 9:20:00AM

Prep Batch: VXX33267
Prep Method: SW5035A
Prep Date/Time: 10/4/2018 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33267]
Blank Spike Lab ID: 1480609
Date Analyzed: 10/04/2018 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	755	101	(78-125)
1,1,1-Trichloroethane	750	814	109	(73-130)
1,1,2,2-Tetrachloroethane	750	730	97	(70-124)
1,1,2-Trichloroethane	750	760	101	(78-121)
1,1-Dichloroethane	750	769	103	(76-125)
1,1-Dichloroethene	750	805	107	(70-131)
1,1-Dichloropropene	750	850	113	(76-125)
1,2,3-Trichlorobenzene	750	597	80	(66-130)
1,2,3-Trichloropropane	750	761	102	(73-125)
1,2,4-Trichlorobenzene	750	661	88	(67-129)
1,2,4-Trimethylbenzene	750	832	111	(75-123)
1,2-Dibromo-3-chloropropane	750	695	93	(61-132)
1,2-Dibromoethane	750	736	98	(78-122)
1,2-Dichlorobenzene	750	776	103	(78-121)
1,2-Dichloroethane	750	779	104	(73-128)
1,2-Dichloropropane	750	803	107	(76-123)
1,3,5-Trimethylbenzene	750	826	110	(73-124)
1,3-Dichlorobenzene	750	780	104	(77-121)
1,3-Dichloropropane	750	836	111	(77-121)
1,4-Dichlorobenzene	750	780	104	(75-120)
2,2-Dichloropropane	750	814	109	(67-133)
2-Butanone (MEK)	2250	2000	89	(51-148)
2-Chlorotoluene	750	806	107	(75-122)
2-Hexanone	2250	2030	90	(53-145)
4-Chlorotoluene	750	790	105	(72-124)
4-Isopropyltoluene	750	832	111	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	1950	87	(65-135)
Acetone	2250	2130	95	(36-164)
Benzene	750	803	107	(77-121)
Bromobenzene	750	799	106	(78-121)
Bromochloromethane	750	753	100	(78-125)
Bromodichloromethane	750	796	106	(75-127)
Bromoform	750	742	99	(67-132)
Bromomethane	750	868	116	(53-143)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33267]
Blank Spike Lab ID: 1480609
Date Analyzed: 10/04/2018 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)		CL
Carbon disulfide	1130	1270	113		(63-132)
Carbon tetrachloride	750	866	115		(70-135)
Chlorobenzene	750	781	104		(79-120)
Chloroethane	750	1020	136		(59-139)
Chloroform	750	814	109		(78-123)
Chloromethane	750	772	103		(50-136)
cis-1,2-Dichloroethene	750	764	102		(77-123)
cis-1,3-Dichloropropene	750	852	114		(74-126)
Dibromochloromethane	750	778	104		(74-126)
Dibromomethane	750	747	100		(78-125)
Dichlorodifluoromethane	750	658	88		(29-149)
Ethylbenzene	750	789	105		(76-122)
Freon-113	1130	1210	108		(66-136)
Hexachlorobutadiene	750	879	117		(61-135)
Isopropylbenzene (Cumene)	750	789	105		(68-134)
Methylene chloride	750	856	114		(70-128)
Methyl-t-butyl ether	1130	1100	98		(73-125)
Naphthalene	750	612	82		(62-129)
n-Butylbenzene	750	861	115		(70-128)
n-Propylbenzene	750	831	111		(73-125)
o-Xylene	750	782	104		(77-123)
P & M -Xylene	1500	1570	105		(77-124)
sec-Butylbenzene	750	823	110		(73-126)
Styrene	750	796	106		(76-124)
tert-Butylbenzene	750	808	108		(73-125)
Tetrachloroethene	750	809	108		(73-128)
Toluene	750	783	104		(77-121)
trans-1,2-Dichloroethene	750	781	104		(74-125)
trans-1,3-Dichloropropene	750	773	103		(71-130)
Trichloroethene	750	827	110		(77-123)
Trichlorofluoromethane	750	1600	213	*	(62-140)
Vinyl acetate	750	780	104		(50-151)
Vinyl chloride	750	807	108		(56-135)
Xylenes (total)	2250	2360	105		(78-124)

Print Date: 10/16/2018 9:40:19AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33267]
Blank Spike Lab ID: 1480609
Date Analyzed: 10/04/2018 10:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	91.1	91	(71-136)
4-Bromofluorobenzene (surr)	750	103	103	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS18409**
Analytical Method: **SW8260C**
Instrument: **VSA Agilent GC/MS 7890B/5977A**
Analyst: **NRO**

Prep Batch: **VXX33267**
Prep Method: **SW5035A**
Prep Date/Time: **10/04/2018 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1185684001
MS Sample ID: 1480610 MS
MSD Sample ID: 1480611 MSD

Analysis Date: 10/04/2018 13:40
Analysis Date: 10/04/2018 12:14
Analysis Date: 10/04/2018 12:32
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	15.1U	565	547	97	565	555	98	78-125	1.50	(< 20)
1,1,1-Trichloroethane	18.9U	565	572	101	565	537	95	73-130	6.40	(< 20)
1,1,2,2-Tetrachloroethane	9.46U	565	537	95	565	549	97	70-124	2.30	(< 20)
1,1,2-Trichloroethane	7.57U	565	553	98	565	567	100	78-121	2.60	(< 20)
1,1-Dichloroethane	18.9U	565	539	95	565	518	92	76-125	4.10	(< 20)
1,1-Dichloroethene	18.9U	565	569	101	565	530	94	70-131	7.00	(< 20)
1,1-Dichloropropene	18.9U	565	597	106	565	562	99	76-125	6.10	(< 20)
1,2,3-Trichlorobenzene	37.9U	565	451	80	565	518	92	66-130	13.80	(< 20)
1,2,3-Trichloropropane	18.9U	565	546	97	565	569	101	73-125	4.30	(< 20)
1,2,4-Trichlorobenzene	18.9U	565	498	88	565	531	94	67-129	6.40	(< 20)
1,2,4-Trimethylbenzene	37.9U	565	606	107	565	570	101	75-123	5.90	(< 20)
1,2-Dibromo-3-chloropropane	75.7U	565	516	91	565	535	95	61-132	3.70	(< 20)
1,2-Dibromoethane	7.57U	565	541	96	565	559	99	78-122	3.30	(< 20)
1,2-Dichlorobenzene	18.9U	565	532	94	565	528	93	78-121	0.76	(< 20)
1,2-Dichloroethane	7.57U	565	550	97	565	540	96	73-128	1.90	(< 20)
1,2-Dichloropropane	7.57U	565	569	101	565	558	99	76-123	2.00	(< 20)
1,3,5-Trimethylbenzene	18.9U	565	594	105	565	568	101	73-124	4.40	(< 20)
1,3-Dichlorobenzene	18.9U	565	551	98	565	531	94	77-121	3.70	(< 20)
1,3-Dichloropropane	7.57U	565	603	107	565	621	110	77-121	2.80	(< 20)
1,4-Dichlorobenzene	18.9U	565	551	98	565	530	94	75-120	4.00	(< 20)
2,2-Dichloropropane	18.9U	565	573	101	565	537	95	67-133	6.50	(< 20)
2-Butanone (MEK)	189U	1700	1477	87	1700	1600	95	51-148	8.30	(< 20)
2-Chlorotoluene	18.9U	565	560	99	565	549	97	75-122	1.90	(< 20)
2-Hexanone	75.7U	1700	1465	86	1700	1667	98	53-145	12.70	(< 20)
4-Chlorotoluene	18.9U	565	567	100	565	540	96	72-124	4.80	(< 20)
4-Isopropyltoluene	75.7U	565	593	105	565	568	100	73-127	4.40	(< 20)
4-Methyl-2-pentanone (MIBK)	189U	1700	1387	82	1700	1544	91	65-135	10.80	(< 20)
Acetone	189U	1700	1544	91	1700	1667	99	36-164	8.30	(< 20)
Benzene	9.46U	565	567	100	565	554	98	77-121	2.40	(< 20)
Bromobenzene	18.9U	565	548	97	565	534	94	78-121	2.70	(< 20)
Bromochloromethane	18.9U	565	528	94	565	510	90	78-125	3.50	(< 20)
Bromodichloromethane	18.9U	565	564	100	565	546	97	75-127	3.30	(< 20)
Bromoform	18.9U	565	548	97	565	563	100	67-132	2.70	(< 20)
Bromomethane	151U	565	604	107	565	548	97	53-143	9.70	(< 20)
Carbon disulfide	75.7U	848	899	106	848	813	96	63-132	10.20	(< 20)
Carbon tetrachloride	9.46U	565	610	108	565	565	100	70-135	7.50	(< 20)
Chlorobenzene	18.9U	565	554	98	565	558	99	79-120	0.73	(< 20)

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1185684001
MS Sample ID: 1480610 MS
MSD Sample ID: 1480611 MSD

Analysis Date: 10/04/2018 13:40
Analysis Date: 10/04/2018 12:14
Analysis Date: 10/04/2018 12:32
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroethane	151U	565	683	121		565	562	99	59-139	19.60	(< 20)
Chloroform	18.9U	565	575	102		565	550	97	78-123	4.30	(< 20)
Chloromethane	18.9U	565	579	102		565	527	93	50-136	9.60	(< 20)
cis-1,2-Dichloroethene	18.9U	565	547	97		565	515	91	77-123	6.20	(< 20)
cis-1,3-Dichloropropene	9.46U	565	602	106		565	596	105	74-126	0.87	(< 20)
Dibromochloromethane	18.9U	565	567	100		565	569	101	74-126	0.27	(< 20)
Dibromomethane	18.9U	565	529	94		565	523	93	78-125	1.00	(< 20)
Dichlorodifluoromethane	37.9U	565	512	91		565	454	80	29-149	12.00	(< 20)
Ethylbenzene	18.9U	565	560	99		565	557	99	76-122	0.64	(< 20)
Freon-113	75.7U	848	853	101		848	803	95	66-136	6.00	(< 20)
Hexachlorobutadiene	15.1U	565	775	137	*	565	705	125	61-135	9.50	(< 20)
Isopropylbenzene (Cumene)	18.9U	565	576	102		565	583	103	68-134	1.00	(< 20)
Methylene chloride	75.7U	565	584	103		565	557	99	70-128	4.50	(< 20)
Methyl-t-butyl ether	75.7U	848	775	92		848	810	96	73-125	4.30	(< 20)
Naphthalene	18.9U	565	465	82		565	536	95	62-129	14.30	(< 20)
n-Butylbenzene	18.9U	565	626	111		565	578	102	70-128	8.00	(< 20)
n-Propylbenzene	18.9U	565	577	102		565	572	101	73-125	1.00	(< 20)
o-Xylene	18.9U	565	576	102		565	577	102	77-123	0.15	(< 20)
P & M -Xylene	37.9U	1130	1130	100		1130	1141	101	77-124	0.87	(< 20)
sec-Butylbenzene	18.9U	565	589	104		565	565	100	73-126	4.20	(< 20)
Styrene	18.9U	565	593	105		565	585	103	76-124	1.30	(< 20)
tert-Butylbenzene	18.9U	565	572	101		565	558	99	73-125	2.50	(< 20)
Tetrachloroethene	9.46U	565	582	103		565	570	101	73-128	1.90	(< 20)
Toluene	18.9U	565	553	98		565	547	97	77-121	1.00	(< 20)
trans-1,2-Dichloroethene	18.9U	565	554	98		565	527	93	74-125	4.90	(< 20)
trans-1,3-Dichloropropene	9.46U	565	563	100		565	569	101	71-130	1.20	(< 20)
Trichloroethene	7.57U	565	585	104		565	563	100	77-123	3.90	(< 20)
Trichlorofluoromethane	37.9U	565	1085	192	*	565	682	121	62-140	45.50	* (< 20)
Vinyl acetate	75.7U	565	557	99		565	575	102	50-151	3.10	(< 20)
Vinyl chloride	7.57U	565	594	105		565	525	93	56-135	12.40	(< 20)
Xylenes (total)	56.8U	1700	1711	101		1700	1723	101	78-124	0.63	(< 20)
Surrogates											
1,2-Dichloroethane-D4 (surr)		565	517	91		565	518	92	71-136	0.23	
4-Bromofluorobenzene (surr)		649	661	102		649	641	99	55-151	3.10	
Toluene-d8 (surr)		565	574	101		565	575	102	85-116	0.31	

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1185684001
MS Sample ID: 1480610 MS
MSD Sample ID: 1480611 MSD

Analysis Date:
Analysis Date: 10/04/2018 12:14
Analysis Date: 10/04/2018 12:32
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **SW8260C**

		Matrix Spike (%)			Spike Duplicate (%)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL

Batch Information

Analytical Batch: VMS18409
Analytical Method: SW8260C
Instrument: VSA Agilent GC/MS 7890B/5977A
Analyst: NRO
Analytical Date/Time: 10/4/2018 12:14:00PM

Prep Batch: VXX33267
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 10/4/2018 6:00:00AM
Prep Initial Wt./Vol.: 107.84g
Prep Extract Vol: 36.48mL

Print Date: 10/16/2018 9:40:20AM

Method Blank

Blank ID: MB for HBN 1787310 [VXX/33277]
Blank Lab ID: 1480853

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570001, 1185570006, 1185570007, 1185570008

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Xylenes (total)	0.0375U	0.0750	0.0228	mg/Kg
Surrogates				
1,4-Difluorobenzene (surr)	89.1	72-119		%
4-Bromofluorobenzene (surr)	86.1	50-150		%

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/4/2018 11:41:00AM

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33277]
Blank Spike Lab ID: 1480854
Date Analyzed: 10/04/2018 10:30

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33277]
Spike Duplicate Lab ID: 1480855
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570001, 1185570006, 1185570007, 1185570008

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	11.7	94	12.5	11.7	93	(60-120)	0.65	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	89.9	90	1.25	93.4	93	(50-150)	3.90	

Batch Information

Analytical Batch: **VFC14476**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33277**
Prep Method: **SW5035A**
Prep Date/Time: **10/04/2018 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33277]
Blank Spike Lab ID: 1480856
Date Analyzed: 10/04/2018 11:05

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33277]
Spike Duplicate Lab ID: 1480857
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570001, 1185570006, 1185570007, 1185570008

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.37	110	1.25	1.29	103	(75-125)	6.50	(< 20)
Ethylbenzene	1.25	1.35	108	1.25	1.30	104	(75-125)	3.80	(< 20)
o-Xylene	1.25	1.26	101	1.25	1.24	99	(75-125)	1.60	(< 20)
P & M -Xylene	2.50	2.63	105	2.50	2.54	102	(80-125)	3.40	(< 20)
Toluene	1.25	1.31	104	1.25	1.29	103	(70-125)	1.10	(< 20)
Xylenes (total)	3.75	3.89	104	3.75	3.78	101	(78-124)	2.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1.25	101	101	1.25	89	89	(72-119)	12.50	

Batch Information

Analytical Batch: **VFC14476**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33277**
Prep Method: **SW5035A**
Prep Date/Time: **10/04/2018 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1185593003
MS Sample ID: 1480858 MS
MSD Sample ID: 1480859 MSD

Analysis Date: 10/04/2018 16:46
Analysis Date: 10/04/2018 17:04
Analysis Date: 10/04/2018 17:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570001, 1185570006, 1185570007, 1185570008

Results by **AK101**

		Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.00996J	1.43	1.41	98	1.43	1.52	106	75-125	7.90	(< 20)
Ethylbenzene	0.0160U	1.43	1.45	102	1.43	1.48	104	75-125	1.80	(< 20)
o-Xylene	0.0160U	1.43	1.39	98	1.43	1.46	102	75-125	4.60	(< 20)
P & M -Xylene	0.0321U	2.85	2.84	100	2.85	2.95	103	80-125	3.70	(< 20)
Toluene	0.0160U	1.43	1.45	102	1.43	1.47	103	70-125	1.50	(< 20)
Xylenes (total)	0.0482U	4.28	4.23	99	4.28	4.41	103	78-124	4.00	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		1.43	1.29	90	1.43	1.40	99	72-119	9.00	

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/4/2018 5:04:00PM

Prep Batch: VXX33277
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 47.02g
Prep Extract Vol: 25.00mL

Print Date: 10/16/2018 9:40:23AM

Method Blank

Blank ID: MB for HBN 1787310 [VXX/33277]
Blank Lab ID: 1480853

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570001, 1185570006, 1185570007, 1185570008

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	89.1	72-119		%

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/4/2018 11:41:00AM

Prep Batch: VXX33277
Prep Method: SW5035A
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33277]
Blank Spike Lab ID: 1480856
Date Analyzed: 10/04/2018 11:05

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33277]
Spike Duplicate Lab ID: 1480857
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570001, 1185570006, 1185570007, 1185570008

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1370	110	1250	1290	103	(75-125)	6.50	(< 20)
Ethylbenzene	1250	1350	108	1250	1300	104	(75-125)	3.80	(< 20)
o-Xylene	1250	1260	101	1250	1240	99	(75-125)	1.60	(< 20)
P & M -Xylene	2500	2630	105	2500	2540	102	(80-125)	3.40	(< 20)
Toluene	1250	1310	104	1250	1290	103	(70-125)	1.10	(< 20)
Xylenes (total)	3750	3890	104	3750	3780	101	(78-124)	2.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	101	101	1250	89	89	(72-119)	12.50	

Batch Information

Analytical Batch: **VFC14476**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33277**
Prep Method: **SW5035A**
Prep Date/Time: **10/04/2018 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1185593003
MS Sample ID: 1480858 MS
MSD Sample ID: 1480859 MSD

Analysis Date: 10/04/2018 16:46
Analysis Date: 10/04/2018 17:04
Analysis Date: 10/04/2018 17:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570001, 1185570006, 1185570007, 1185570008

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	9.96J	1426	1415	98	1426	1522	106	75-125	7.90	(< 20)
Ethylbenzene	16.1U	1426	1447	102	1426	1479	104	75-125	1.80	(< 20)
o-Xylene	16.1U	1426	1393	98	1426	1458	102	75-125	4.60	(< 20)
P & M -Xylene	32.1U	2851	2840	100	2851	2947	103	80-125	3.70	(< 20)
Toluene	16.1U	1426	1447	102	1426	1468	103	70-125	1.50	(< 20)
Xylenes (total)	48.2U	4277	4234	99	4277	4405	103	78-124	4.00	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		1426	1286	90	1426	1404	99	72-119	9.00	

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/4/2018 5:04:00PM

Prep Batch: VXX33277
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 47.02g
Prep Extract Vol: 25.00mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1787311 [VXX/33278]
Blank Lab ID: 1480860

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570002, 1185570003, 1185570004, 1185570010

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	79.5	50-150		%

Batch Information

Analytical Batch: VFC14476
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/4/2018 7:28:00PM

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33278]
Blank Spike Lab ID: 1480861
Date Analyzed: 10/04/2018 19:46

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33278]
Spike Duplicate Lab ID: 1480862
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570010

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	11.5	92	12.5	11.3	91	(60-120)	1.00	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	89.5	90	1.25	91.9	92	(50-150)	2.60	

Batch Information

Analytical Batch: **VFC14476**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33278**
Prep Method: **SW5035A**
Prep Date/Time: **10/04/2018 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1787311 [VXX/33278]
Blank Lab ID: 1480860

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570002, 1185570003, 1185570004, 1185570010

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	97.6	72-119		%

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/4/2018 7:28:00PM

Prep Batch: VXX33278
Prep Method: SW5035A
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33278]
Blank Spike Lab ID: 1480863
Date Analyzed: 10/04/2018 20:21

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33278]
Spike Duplicate Lab ID: 1480864
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570010

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1270	102	1250	1230	99	(75-125)	2.80	(< 20)
Ethylbenzene	1250	1280	102	1250	1250	100	(75-125)	2.30	(< 20)
o-Xylene	1250	1240	100	1250	1260	100	(75-125)	0.84	(< 20)
P & M -Xylene	2500	2500	100	2500	2500	100	(80-125)	0.16	(< 20)
Toluene	1250	1230	98	1250	1210	97	(70-125)	1.30	(< 20)
Xylenes (total)	3750	3740	100	3750	3760	100	(78-124)	0.39	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	100	100	1250	101	101	(72-119)	0.83	

Batch Information

Analytical Batch: **VFC14476**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33278**
Prep Method: **SW5035A**
Prep Date/Time: **10/04/2018 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1185593014
MS Sample ID: 1480865 MS
MSD Sample ID: 1480866 MSD

Analysis Date: 10/04/2018 23:56
Analysis Date: 10/05/2018 0:14
Analysis Date: 10/05/2018 0:32
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570010

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	6.65U	1191	1296	108	1191	1275	107	75-125	1.20	(< 20)
Ethylbenzene	13.3U	1191	1317	110	1191	1254	105	75-125	4.90	(< 20)
o-Xylene	13.3U	1191	1233	103	1191	1222	102	75-125	1.10	(< 20)
P & M -Xylene	26.6U	2392	2540	106	2392	2476	104	80-125	2.80	(< 20)
Toluene	13.3U	1191	1286	107	1191	1254	105	70-125	2.30	(< 20)
Xylenes (total)	39.9U	3583	3783	105	3583	3699	103	78-124	2.20	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		1191	1159	97	1191	1243	104	72-119	6.90	

Batch Information

Analytical Batch: VFC14476
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/5/2018 12:14:00AM

Prep Batch: VXX33278
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/4/2018 8:00:00AM
Prep Initial Wt./Vol.: 55.11g
Prep Extract Vol: 25.00mL

Print Date: 10/16/2018 9:40:31AM

Method Blank

Blank ID: MB for HBN 1787365 [VXX/33285]
Blank Lab ID: 1481130

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570011, 1185570012

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	83.5	50-150		%

Batch Information

Analytical Batch: VFC14479
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/5/2018 12:43:00PM

Prep Batch: VXX33285
Prep Method: SW5035A
Prep Date/Time: 10/5/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33285]
Blank Spike Lab ID: 1481131
Date Analyzed: 10/05/2018 11:31

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33285]
Spike Duplicate Lab ID: 1481132
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570011, 1185570012

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	11.8	95	12.5	10.8	86	(60-120)	9.30	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	84.4	84	1.25	86.6	87	(50-150)	2.60	

Batch Information

Analytical Batch: **VFC14479**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33285**
Prep Method: **SW5035A**
Prep Date/Time: **10/05/2018 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1787365 [VXX/33285]
Blank Lab ID: 1481130

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570011, 1185570012

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	89.8	72-119		%

Batch Information

Analytical Batch: VFC14479
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/5/2018 12:43:00PM

Prep Batch: VXX33285
Prep Method: SW5035A
Prep Date/Time: 10/5/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33285]
Blank Spike Lab ID: 1481133
Date Analyzed: 10/05/2018 12:07

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33285]
Spike Duplicate Lab ID: 1481134
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570011, 1185570012

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1270	102	1250	1350	108	(75-125)	5.90	(< 20)
Ethylbenzene	1250	1330	106	1250	1320	105	(75-125)	0.79	(< 20)
o-Xylene	1250	1270	102	1250	1270	102	(75-125)	0.35	(< 20)
P & M -Xylene	2500	2600	104	2500	2620	105	(80-125)	0.98	(< 20)
Toluene	1250	1280	102	1250	1290	103	(70-125)	1.20	(< 20)
Xylenes (total)	3750	3870	103	3750	3900	104	(78-124)	0.77	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	94.2	94	1250	102	102	(72-119)	8.10	

Batch Information

Analytical Batch: **VFC14479**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33285**
Prep Method: **SW5035A**
Prep Date/Time: **10/05/2018 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1185642070
MS Sample ID: 1481135 MS
MSD Sample ID: 1481136 MSD

Analysis Date: 10/05/2018 17:47
Analysis Date: 10/05/2018 18:05
Analysis Date: 10/05/2018 18:23
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570011, 1185570012

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	23.9U	2895	3035	105	2895	3070	106	75-125	1.20	(< 20)
Ethylbenzene	47.8U	2895	2930	101	2895	3140	108	75-125	6.70	(< 20)
o-Xylene	47.8U	2895	2877	99	2895	2982	103	75-125	3.50	(< 20)
P & M -Xylene	95.5U	5789	5825	101	5789	6123	106	80-125	4.90	(< 20)
Toluene	47.8U	2895	2895	100	2895	2965	103	70-125	2.40	(< 20)
Xylenes (total)	143U	8684	8702	100	8684	9088	105	78-124	4.40	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		2895	2912	101	2895	2842	98	72-119	2.80	

Batch Information

Analytical Batch: VFC14479
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/5/2018 6:05:00PM

Prep Batch: VXX33285
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/5/2018 8:00:00AM
Prep Initial Wt./Vol.: 37.90g
Prep Extract Vol: 25.00mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1787411 [VXX/33293]
Blank Lab ID: 1481341

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Xylenes (total)	0.0375U	0.0750	0.0228	mg/Kg
Surrogates				
1,4-Difluorobenzene (surr)	95.1	72-119		%
4-Bromofluorobenzene (surr)	82.3	50-150		%

Batch Information

Analytical Batch: VFC14483
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/7/2018 10:37:00PM

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 10/7/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33293]
Blank Spike Lab ID: 1481342
Date Analyzed: 10/07/2018 21:26

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33293]
Spike Duplicate Lab ID: 1481343
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	10.8	86	12.5	10.6	85	(60-120)	1.30	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	81.6	82	1.25	83.8	84	(50-150)	2.60	

Batch Information

Analytical Batch: **VFC14483**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33293**
Prep Method: **SW5035A**
Prep Date/Time: **10/07/2018 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33293]
Blank Spike Lab ID: 1481344
Date Analyzed: 10/07/2018 22:02

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33293]
Spike Duplicate Lab ID: 1481345
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.25	100	1.25	1.29	103	(75-125)	2.70	(< 20)
Ethylbenzene	1.25	1.26	101	1.25	1.30	104	(75-125)	3.70	(< 20)
o-Xylene	1.25	1.23	98	1.25	1.25	100	(75-125)	1.50	(< 20)
P & M -Xylene	2.50	2.49	100	2.50	2.53	101	(80-125)	1.90	(< 20)
Toluene	1.25	1.28	102	1.25	1.28	102	(70-125)	0.06	(< 20)
Xylenes (total)	3.75	3.72	99	3.75	3.78	101	(78-124)	1.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1.25	96.3	96	1.25	91.5	92	(72-119)	5.10	

Batch Information

Analytical Batch: **VFC14483**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33293**
Prep Method: **SW5035A**
Prep Date/Time: **10/07/2018 08:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1481422
MS Sample ID: 1481346 MS
MSD Sample ID: 1481347 MSD

Analysis Date: 10/07/2018 23:31
Analysis Date: 10/07/2018 23:49
Analysis Date: 10/08/2018 0:07
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **AK101**

		Matrix Spike (mg/Kg)				Spike Duplicate (mg/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzene	0.00440U	0.880	0.944	107		0.880	0.904	103		75-125	4.40	(< 20)
Ethylbenzene	0.0727	0.880	0.955	100		0.880	0.915	96		75-125	4.20	(< 20)
o-Xylene	2.83	0.880	1.72	-126	*	0.880	1.61	-139	*	75-125	6.70	(< 20)
P & M -Xylene	0.584	1.76	2.91	132	*	1.76	2.74	123		80-125	5.70	(< 20)
Toluene	0.00880U	0.880	0.883	100		0.880	0.880	100		70-125	0.34	(< 20)
Xylenes (total)	3.41	2.64	4.63	46	*	2.64	4.35	36	*	78-124	6.10	(< 20)
Surrogates												
1,4-Difluorobenzene (surr)		0.880	0.895	102		0.880	0.866	98		72-119	3.30	

Batch Information

Analytical Batch: VFC14483
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/7/2018 11:49:00PM

Prep Batch: VXX33293
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/7/2018 8:00:00AM
Prep Initial Wt./Vol.: 71.01g
Prep Extract Vol: 25.00mL

Print Date: 10/16/2018 9:40:40AM

Method Blank

Blank ID: MB for HBN 1787411 [VXX/33293]
Blank Lab ID: 1481341

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	95.1	72-119		%

Batch Information

Analytical Batch: VFC14483
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/7/2018 10:37:00PM

Prep Batch: VXX33293
Prep Method: SW5035A
Prep Date/Time: 10/7/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33293]
Blank Spike Lab ID: 1481344
Date Analyzed: 10/07/2018 22:02

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33293]
Spike Duplicate Lab ID: 1481345
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1250	100	1250	1290	103	(75-125)	2.70	(< 20)
Ethylbenzene	1250	1260	101	1250	1300	104	(75-125)	3.70	(< 20)
o-Xylene	1250	1230	98	1250	1250	100	(75-125)	1.50	(< 20)
P & M -Xylene	2500	2490	100	2500	2530	101	(80-125)	1.90	(< 20)
Toluene	1250	1280	102	1250	1280	102	(70-125)	0.06	(< 20)
Xylenes (total)	3750	3720	99	3750	3780	101	(78-124)	1.70	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	96.3	96	1250	91.5	92	(72-119)	5.10	

Batch Information

Analytical Batch: **VFC14483**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33293**
Prep Method: **SW5035A**
Prep Date/Time: **10/07/2018 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1481422
MS Sample ID: 1481346 MS
MSD Sample ID: 1481347 MSD

Analysis Date: 10/07/2018 23:31
Analysis Date: 10/07/2018 23:49
Analysis Date: 10/08/2018 0:07
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570002, 1185570003, 1185570004, 1185570014, 1185570015, 1185570016

Results by **SW8021B**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzene	4.40U	880	944	107		880	904	103		75-125	4.40	(< 20)
Ethylbenzene	72.7	880	955	100		880	915	96		75-125	4.20	(< 20)
o-Xylene	2830	880	1720	-126	*	880	1610	-139	*	75-125	6.70	(< 20)
P & M -Xylene	584	1760	2910	132	*	1760	2740	123		80-125	5.70	(< 20)
Toluene	8.80U	880	883	100		880	880	100		70-125	0.34	(< 20)
Xylenes (total)	3410	2640	4630	46	*	2640	4350	36	*	78-124	6.10	(< 20)
Surrogates												
1,4-Difluorobenzene (surr)		880	895	102		880	866	98		72-119	3.30	

Batch Information

Analytical Batch: VFC14483
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/7/2018 11:49:00PM

Prep Batch: VXX33293
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/7/2018 8:00:00AM
Prep Initial Wt./Vol.: 71.01g
Prep Extract Vol: 25.00mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1787456 [VXX/33300]
Blank Lab ID: 1481497

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570005, 1185570009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	83.5	50-150		%

Batch Information

Analytical Batch: VFC14484
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2018 5:53:00PM

Prep Batch: VXX33300
Prep Method: SW5035A
Prep Date/Time: 10/8/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33300]
Blank Spike Lab ID: 1481498
Date Analyzed: 10/08/2018 16:41

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33300]
Spike Duplicate Lab ID: 1481499
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570005, 1185570009

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	11.0	88	12.5	10.9	87	(60-120)	0.88	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	87.8	88	1.25	88	88	(50-150)	0.14	

Batch Information

Analytical Batch: **VFC14484**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33300**
Prep Method: **SW5035A**
Prep Date/Time: **10/08/2018 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1787456 [VXX/33300]
Blank Lab ID: 1481497

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570005, 1185570009

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	98.2	72-119		%

Batch Information

Analytical Batch: VFC14484
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2018 5:53:00PM

Prep Batch: VXX33300
Prep Method: SW5035A
Prep Date/Time: 10/8/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33300]
Blank Spike Lab ID: 1481500
Date Analyzed: 10/08/2018 17:17

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33300]
Spike Duplicate Lab ID: 1481501
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570005, 1185570009

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1310	105	1250	1210	97	(75-125)	7.80	(< 20)
Ethylbenzene	1250	1300	104	1250	1280	102	(75-125)	1.60	(< 20)
o-Xylene	1250	1260	101	1250	1210	97	(75-125)	4.10	(< 20)
P & M -Xylene	2500	2570	103	2500	2490	100	(80-125)	3.10	(< 20)
Toluene	1250	1290	103	1250	1270	101	(70-125)	1.70	(< 20)
Xylenes (total)	3750	3830	102	3750	3700	99	(78-124)	3.40	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	96.1	96	1250	89.6	90	(72-119)	7.00	

Batch Information

Analytical Batch: **VFC14484**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33300**
Prep Method: **SW5035A**
Prep Date/Time: **10/08/2018 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1185570005
MS Sample ID: 1481504 MS
MSD Sample ID: 1481505 MSD

Analysis Date: 10/08/2018 18:47
Analysis Date: 10/08/2018 19:04
Analysis Date: 10/08/2018 19:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570005, 1185570009

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	7.49J	897	974	108	897	918	101	75-125	5.90	(< 20)
Ethylbenzene	7.07J	897	969	107	897	901	100	75-125	7.40	(< 20)
o-Xylene	143	897	1226	121	897	1121	109	75-125	9.00	(< 20)
P & M -Xylene	82.8	1797	2093	112	1797	1913	102	80-125	8.90	(< 20)
Toluene	20.6J	897	950	104	897	928	101	70-125	2.40	(< 20)
Xylenes (total)	226	2696	3319	115	2696	3034	104	78-124	8.90	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		897	912	102	897	875	98	72-119	4.20	

Batch Information

Analytical Batch: VFC14484
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/8/2018 7:04:00PM

Prep Batch: VXX33300
Prep Method: AK101 Extraction (S)
Prep Date/Time: 10/8/2018 8:00:00AM
Prep Initial Wt./Vol.: 73.60g
Prep Extract Vol: 25.00mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1787460 [VXX/33301]
Blank Lab ID: 1481519

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570013

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
1,4-Difluorobenzene (surr)	87.7	72-119		%
4-Bromofluorobenzene (surr)	80.4	50-150		%

Batch Information

Analytical Batch: VFC14484
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 10/9/2018 1:02:00AM

Prep Batch: VXX33301
Prep Method: SW5035A
Prep Date/Time: 10/8/2018 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [VXX33301]
Blank Spike Lab ID: 1481520
Date Analyzed: 10/09/2018 01:19

Spike Duplicate ID: LCSD for HBN 1185570 [VXX33301]
Spike Duplicate Lab ID: 1481521
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570013

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	11.3	91	12.5	11.1	89	(60-120)	2.40	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	92.1	92	1.25	89.9	90	(50-150)	2.40	

Batch Information

Analytical Batch: **VFC14484**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX33301**
Prep Method: **SW5035A**
Prep Date/Time: **10/08/2018 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Method Blank

Blank ID: MB for HBN 1786972 [XXX/40615]
Blank Lab ID: 1479316

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570001, 1185570002, 1185570003, 1185570004, 1185570005, 1185570006, 1185570007, 1185570008, 1185570009, 1185570010, 1185570011, 1185570012, 1185570013, 1185570014, 1185570015

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	106	60-120		%

Batch Information

Analytical Batch: XFC14666
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: VDL
Analytical Date/Time: 10/1/2018 12:55:00PM

Prep Batch: XXX40615
Prep Method: SW3550C
Prep Date/Time: 9/29/2018 8:51:35AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [XXX40615]
Blank Spike Lab ID: 1479317
Date Analyzed: 10/01/2018 13:05

Spike Duplicate ID: LCSD for HBN 1185570 [XXX40615]
Spike Duplicate Lab ID: 1479318
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570001, 1185570002, 1185570003, 1185570004, 1185570005, 1185570006, 1185570007, 1185570008, 1185570009, 1185570010, 1185570011, 1185570012, 1185570013, 1185570014, 1185570015

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	833	873	105	833	877	105	(75-125)	0.45	(< 20)
Surrogates									
5a Androstane (surr)	16.7	106	106	16.7	107	107	(60-120)	0.20	

Batch Information

Analytical Batch: **XFC14666**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **VDL**

Prep Batch: **XXX40615**
Prep Method: **SW3550C**
Prep Date/Time: **09/29/2018 08:51**
Spike Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 833 mg/Kg Extract Vol: 5 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1786974 [XXX/40616]
Blank Lab ID: 1479324

Matrix: Soil/Solid (dry weight)

QC for Samples:
1185570006, 1185570007, 1185570013, 1185570015

Results by **8270D SIM (PAH)**

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/Kg
Acenaphthene	12.5U	25.0	6.25	ug/Kg
Acenaphthylene	12.5U	25.0	6.25	ug/Kg
Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/Kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/Kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/Kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/Kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/Kg
Chrysene	12.5U	25.0	6.25	ug/Kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/Kg
Fluoranthene	12.5U	25.0	6.25	ug/Kg
Fluorene	12.5U	25.0	6.25	ug/Kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/Kg
Naphthalene	10.0U	20.0	5.00	ug/Kg
Phenanthrene	12.5U	25.0	6.25	ug/Kg
Pyrene	12.5U	25.0	6.25	ug/Kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	67.9	58-103		%
Fluoranthene-d10 (surr)	68	54-113		%

Batch Information

Analytical Batch: XMS11125
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: BMZ
Analytical Date/Time: 10/2/2018 3:25:00PM

Prep Batch: XXX40616
Prep Method: SW3550C
Prep Date/Time: 9/29/2018 10:44:31AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1185570 [XXX40616]
Blank Spike Lab ID: 1479325
Date Analyzed: 10/02/2018 15:45

Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **8270D SIM (PAH)**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	85.4	77	(43-111)
2-Methylnaphthalene	111	84.2	76	(39-114)
Acenaphthene	111	96.5	87	(44-111)
Acenaphthylene	111	84.8	76	(39-116)
Anthracene	111	92.3	83	(50-114)
Benzo(a)Anthracene	111	84.0	76	(54-122)
Benzo[a]pyrene	111	88.9	80	(50-125)
Benzo[b]Fluoranthene	111	91.9	83	(53-128)
Benzo[g,h,i]perylene	111	90.4	81	(49-127)
Benzo[k]fluoranthene	111	96.8	87	(56-123)
Chrysene	111	90.1	81	(57-118)
Dibenzo[a,h]anthracene	111	96.7	87	(50-129)
Fluoranthene	111	82.1	74	(55-119)
Fluorene	111	93.4	84	(47-114)
Indeno[1,2,3-c,d] pyrene	111	93.1	84	(49-130)
Naphthalene	111	76.5	69	(38-111)
Phenanthrene	111	90.0	81	(49-113)
Pyrene	111	84.9	76	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111	75.4	75	(58-103)
Fluoranthene-d10 (surr)	111	72.4	72	(54-113)

Batch Information

Analytical Batch: **XMS11125**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **BMZ**

Prep Batch: **XXX40616**
Prep Method: **SW3550C**
Prep Date/Time: **09/29/2018 10:44**
Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/16/2018 9:40:54AM

Matrix Spike Summary

Original Sample ID: 1185570006
MS Sample ID: 1479326 MS
MSD Sample ID: 1479327 MSD

Analysis Date: 10/02/2018 17:48
Analysis Date: 10/02/2018 18:08
Analysis Date: 10/02/2018 18:29
Matrix: Soil/Solid (dry weight)

QC for Samples: 1185570006, 1185570007, 1185570013, 1185570015

Results by **8270D SIM (PAH)**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzo(a)Anthracene	12.9U	114	85.6	76		114	87.3	77		54-122	1.90	(< 20)
Benzo[a]pyrene	12.9U	114	92.6	82		114	94.0	83		50-125	1.60	(< 20)
Benzo[b]Fluoranthene	12.9U	114	94.5	84		114	96.1	84		53-128	1.60	(< 20)
Benzo[g,h,i]perylene	12.9U	114	90.2	80		114	93.2	82		49-127	3.20	(< 20)
Benzo[k]fluoranthene	12.9U	114	96.7	86		114	101	88		56-123	4.10	(< 20)
Chrysene	12.9U	114	91.5	81		114	92.1	81		57-118	0.74	(< 20)
Dibenzo[a,h]anthracene	12.9U	114	95.0	84		114	97.2	85		50-129	2.30	(< 20)
Fluoranthene	13.4J	114	86.5	65		114	87.2	65		55-119	0.85	(< 20)
Indeno[1,2,3-c,d] pyrene	12.9U	114	90.6	80		114	93.1	82		49-130	2.70	(< 20)
Pyrene	18.2J	114	95.2	68		114	94.7	67		55-117	0.55	(< 20)
1-Methylnaphthalene	5870	114	5568	-263	*	114	5227	-567	*	43-111	6.50	(< 20)
2-Methylnaphthalene	5080	114	4855	-197	*	114	4535	-477	*	39-114	6.80	(< 20)
Acenaphthene	258U	114	194J	172	*	114	200J	176	*	44-111	3.00	(< 20)
Acenaphthylene	258U	114	258U	0	*	114	258U	0	*	39-116	0.00	(< 20)
Anthracene	258U	114	258U	0	*	114	258U	0	*	50-114	0.00	(< 20)
Fluorene	259J	114	350J	81		114	320J	54		47-114	9.20	(< 20)
Naphthalene	3180	114	2913	-234	*	114	2758	-368	*	38-111	5.50	(< 20)
Phenanthrene	258U	114	202J	179	*	114	196J	172	*	49-113	3.10	(< 20)
Surrogates												
Fluoranthene-d10 (surr)		114	71.3	63		114	72.0	63		54-113	1.10	
2-Methylnaphthalene-d10 (surr)		114	90.1	80		114	66.9	59		58-103	29.40	

Batch Information

Analytical Batch: XMS11125
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: BMZ
Analytical Date/Time: 10/2/2018 6:08:00PM

Prep Batch: XXX40616
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 9/29/2018 10:44:31AM
Prep Initial Wt./Vol.: 22.83g
Prep Extract Vol: 5.00mL

Analytical Batch: XMS11126
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: BMZ
Analytical Date/Time: 10/3/2018 2:46:00PM

Prep Batch: XXX40616
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 9/29/2018 10:44:31AM
Prep Initial Wt./Vol.: 22.83g
Prep Extract Vol: 5.00mL

SGS

REVIEWED: NJW

SGS North America Inc.
CHAIN OF CUSTODY RECORI

1185570

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
West Virginia	Kentucky

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT:

CONTACT: Matt Woods PHONE NO: 907-433-3236

PROJECT NAME: Shishmaref Native Store PROJECT/ PWSID/ PERMIT#: 32-1-20017

REPORTS TO: Dan McMahon E-MAIL: DMX@shanwil.com

Matt Woods MXW@shanwil.com

INVOICE TO: Shannon and Wilson QUOTE #:

P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	GRO (AK101)	DRO (AK102)	BTEX by 8021B	VOCs (SW 8260C)	PAH by 8270D-SIM						REMARKS/ LOC ID
(1) A-B	TP1-4	9/26/2018	833	soil	2	G	X	X	X								
(2) A-B	TP1-5	9/26/2018	842	soil	2	G	X	X	X								
(3) A-B	TP2-3	9/26/2018	939	soil	2	G	X	X	X								
(4) A-B	TP2-39	9/26/2018	1733	soil	2	G	X	X	X								
(5) A-B	TP2-6	9/26/2018	1006	soil	2	G	X	X	X								
(6) A-B	TP3-2	9/26/2018	1134	soil	2	G	X	X		X	X						✓
(7) A-B	TP3-29	9/26/2018	1337	soil	2	G	X	X		X	X						✓
(8) A-B	TP4-4	9/26/2018	1253	soil	2	G	X	X	X								
(9) A-B	TP5-2	9/26/2018	1406	soil	2	G	X	X	X								
(10) A-B	TP5-3	9/26/2018	1405	soil	2	G	X	X	X								

Section 5

	Date	Time	
Relinquished By: (1)	9/28	1330	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	9/28/18	13:51	Received For Laboratory By: KET

Section 4

DOD Project? Yes (No)

Cooler ID: —

Data Deliverable Requirements:

Level 2

Requested Turnaround Time and/or Special Instructions:

Standard TAT

Temp Blank °C: 30 D21

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

1F1B HD

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1185570

Locations Nationwide
aska Maryland
ew Jersey New York
orth Carolina Indiana
est Virgina Kentucky
www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT:

CONTACT: Matt Woods PHONE NO: 907-433-3236

PROJECT NAME: Shishmaref Native Store PROJECT/ PWSID/ PERMIT#: 32-1-20017

REPORTS TO: Dan McMahon E-MAIL: DMX@shanwil.com

Matt Woods MXW@shanwil.com

INVOICE TO: Shannon and Wilson QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	GRO (AK101)	DRO (AK102)	BTEX by 8021B	VOCs (SW 8260C)	PAH by 8270D-SIM					REMARKS/ LOC ID
(11) AB	SS1	9/26/2018	1412	soil	2	G	X	X	X							
(12) A-B	TP6-1	9/26/2018	1557	soil	2	G	X	X	X							
(13) A-B	TP6-3	9/26/2018	1549	soil	2	G	X	X		X	X					✓
(14) A-B	TP7-1	9/26/2018	1655	soil	2	G	X	X	X							
(15) A-B	TP7-3	9/26/2018	1645	soil	2	G	X	X		X	X					✓
(16) A	Trip Blank 01	9/26/2018	1111	soil	1	G	X		X							
~~(17)~~ N/C																
9/25/18																

Section 5

	Date	Time	
Relinquished By: (1)	9/28	1330	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	9/28/18	13:51	Received For Laboratory By: KET

Section 4

DOD Project? Yes (No)

Cooler ID: —

Data Deliverable Requirements:

Level 2

Requested Turnaround Time and/or Special Instructions:

Standard TAT

Temp Blank °C: 30 D21

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

1C 1B

~~INTACT~~ BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

Shipper's Name and Address Shannon and Wilson Inc 5430 Fairbanks Street Suite 3 Anchorage, AK 99518 USA Tel: 907-561-2120	Shipper's Account Number 27442311496 Customer's ID Number 10925
Not Negotiable **Air Waybill** Issued By Alaska AIR CARGO P.O. BOX 68900 SEATTLE, WA 98168 800-225-2752 ALASKACARGO.COM	
Consignee's Name and Address Shannon and Wilson Inc 5430 Fairbanks Street Suite 3 Anchorage, AK 99518 USA Tel: 907-561-2120	Consignee's Account Number 27442311496
Also notify Tel:	
Issuing Carrier's Agent and City	Accounting Information 10925 Shannon and Wilson Inc 5430 Fairbanks Street Suite 3 Anchorage, AK 99518 USA GoldStreak
Agent's IATA Code / Account No.	
Airport of Departure (Addr. of First Carrier) and Requested Routing Nome	

To	By First Carrier	To / By	To / By	Currency		WT/VAL		Other		Declared Value For Carriage	Declared Value For Customs
ANC	Alaska Airlines			USD	PX	X		X		NVD	NCV

Airport of Destination	Flight/Date	Flight/Date	Amount of Insurance
Anchorage	AS 153/27		XXX

Handling Information

DANGEROUS GOODS IN EXCEPTED QUANTITIES DGD AND NOTOC NOT REQUIRED
NOA MATT 989-600-2235

SCI

No of Pieces	Gross Weight	kg lb		Commodity Item No.	Chargeable Weight	Rate / Charge	Total	Nature and Quantity of Goods (Incl. Dimensions or Volume)
1	47.0	L	Q		60.0	1.37	82.20	SOIL SAMPLES DG IN EXCEPTED QUANT UN1993 CLASS 3 DOTSP-15368 Dims: 24 x 14 x14 x 1 GSX REQ
1	47.0						82.20	Volume: 2.722

Prepaid	Weight Charge	Collect	Other Charges
	82.20		XBC 0.00
Valuation Charge			
Tax	5.14		
Total Other Charges Due Agent			
Total Other Charges Due Carrier			
Total Prepaid	87.34	Total Collect	

Shipper certifies that the particulars on the face hereof are correct and that **insofar as any part of the consignment contains dangerous goods, such part is properly described by name and is in proper condition for carriage by air according to the applicable Dangerous Goods Regulations. I consent to the inspection of this cargo.**

For: Shannon and Wilson Inc

Signature of Shipper or his Agent

☐ THIS SHIPMENT DOES NOT CONTAIN DANGEROUS GOODS

☑ THIS SHIPMENT DOES CONTAIN DANGEROUS GOODS

Executed On (Date)	at (Place)	Signature of Issuing Carrier or its Agent
27 Sep 2018 15:01	Nome	Alaska Airlines

May 03, 2017

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

East Building, PHH-30
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

DOT-SP 15368
(SECOND REVISION)

EXPIRATION DATE: 2021-04-30

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Shannon & Wilson, Inc.
Fairbanks, AK

2. PURPOSE AND LIMITATION:

a. This special permit authorizes the transportation in commerce of flammable liquid, n.o.s., containing methanol in soil samples, listed in Paragraph 6, as "Dangerous Goods in Excepted Quantities" when transported and packaged in accordance with 173.4a and this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.

b. The safety analyses performed in the development of this special permit only considered the hazards and risks associated with the transportation in commerce.

c. No party status will be granted to this special permit.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR 173.4a(c) and (d) in that the quantity of hazardous material in inner and outer packagings may exceed the allowable limits.

5. BASIS: This special permit is based on the application of Shannon & Wilson, Inc. dated March 20, 2017 submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identification Number**	**Packing Group**
Flammable liquid, n.o.s.*	3	UN1993	II

*Contains methanol in soil samples contaminated with gasoline or volatile organic compounds.

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Material listed in paragraph 6 must be packed as follows:

(1) Inner packaging must consist of: a 4-oz amber glass jar in which 25 mL of methanol is mixed with 50 grams of a soil sample contaminated with gasoline or volatile organic compounds (VOC) with its lid secured from loosing with tape;

(2) Intermediate packaging must consist of a sample jar individually placed in a resealable plastic bag and wrapped with bubble wrap or encased in vermiculite; and additionally cushioned with a non-reactive, absorbent material.

(3) Outer packaging. The intermediate packaging system must be placed in a foam-insulated polyethylene cooler, with a capacity not more than twenty-five (25) intermediate packagings. All drains of the cooler are taped closed and the lid is closed with two full wraps of strapping tape. The intermediate packaging must be securely cushioned with a non-reactive, absorbent material inside the cooler.

(4) Ice or a substitute must be placed inside the cooler to maintain a temperature of 0°C to 6°C during shipment.

(5) The packagings prescribed must comply with the performance requirements of 49 CFR § 173.4a(c), (d), (e) and (f).

b. OPERATIONAL CONTROLS:

(1) Packages prepared under this special permit may not be carried in checked or carry-on baggage.

(2) Sample packaging and offering dangerous goods for shipment must be performed by trained employees.

c. MARKING - Packages shipped under this special permit must be marked "DOT-SP 15368" and the excepted quantity marking required under § 173.4a(g).

d. SHIPPING PAPERS:

(1) No shipping paper is required.

(2) A document such as an air bill must include the statement "Dangerous Goods in Excepted Quantities".

8. SPECIAL PROVISIONS:

a. A person who is not a holder of this special permit who receives a package covered by this special permit may reoffer it for transportation provided no modification or change is made to the package and it is reoffered for transportation in conformance with this special permit and the HMR.

b. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor Vehicle, Cargo aircraft, Cargo vessel, Passenger aircraft.

10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel, aircraft, or motor vehicle used to transport packages covered by this special permit. The shipper must furnish a copy of this special permit to the air carrier before or at the time the shipment is tendered.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
- Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
- Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) – "The Hazardous Materials Safety and Security Reauthorization Act of 2005" (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term "exemption" to "special permit" and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 - Immediate notice of certain hazardous materials incidents, and 171.16 - Detailed hazardous

e-Sample Receipt Form

SGS Workorder #: **1185570**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		YES Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	YES	1F 1B
COC accompanied samples?	YES	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	YES	Cooler ID: 1 @ 3.0 °C Therm. ID: D21
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	YES	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	YES	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	YES	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	YES	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	YES	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	YES	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1185570001-A	No Preservative Required	OK			
1185570001-B	Methanol field pres. 4 C	OK			
1185570002-A	No Preservative Required	OK			
1185570002-B	Methanol field pres. 4 C	OK			
1185570003-A	No Preservative Required	OK			
1185570003-B	Methanol field pres. 4 C	OK			
1185570004-A	No Preservative Required	OK			
1185570004-B	Methanol field pres. 4 C	OK			
1185570005-A	No Preservative Required	OK			
1185570005-B	Methanol field pres. 4 C	OK			
1185570006-A	No Preservative Required	OK			
1185570006-B	Methanol field pres. 4 C	OK			
1185570007-A	No Preservative Required	OK			
1185570007-B	Methanol field pres. 4 C	OK			
1185570008-A	No Preservative Required	OK			
1185570008-B	Methanol field pres. 4 C	OK			
1185570009-A	No Preservative Required	OK			
1185570009-B	Methanol field pres. 4 C	OK			
1185570010-A	No Preservative Required	OK			
1185570010-B	Methanol field pres. 4 C	OK			
1185570011-A	No Preservative Required	OK			
1185570011-B	Methanol field pres. 4 C	OK			
1185570012-A	No Preservative Required	OK			
1185570012-B	Methanol field pres. 4 C	OK			
1185570013-A	No Preservative Required	OK			
1185570013-B	Methanol field pres. 4 C	OK			
1185570014-A	No Preservative Required	OK			
1185570014-B	Methanol field pres. 4 C	OK			
1185570015-A	No Preservative Required	OK			
1185570015-B	Methanol field pres. 4 C	OK			
1185570016-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: Shishmaref Native Store
Shishmaref, Alaska

Date: February 2019

Laboratory Report Date: October 16, 2018

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Matt Woods
Title: Environmental Engineering Staff
Laboratory Name: SGS North America Inc.
Work Order Number: 1185570
ADEC File Number: 530.38.006

(**NOTE**: ***NA*** = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes / No / NA (Please explain.)**
Comments:

b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No / NA
Comments: *The samples were not transferred to another "network" laboratory or sub-contracted to an alternate laboratory.*

2. Chain of Custody (COC)

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

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

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?
Yes / No / NA (Please explain.)
Comments: *The temperature blank had a temperature of 3.0*° C.

b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes / No / NA (Please explain.)**
Comments:

c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes / No / NA (Please explain.)**
Comments:

d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes / No / NA (Please explain.)**
Comments: *No discrepancies were noted.*

e. Data quality or usability affected? **Yes / No (Please Explain.)**
Comments*:*

4. Case Narrative

a. Present and understandable? **Yes / No / NA (Please explain.)**
Comments:

b. Discrepancies, errors or QC failures noted by the lab? **Yes / No / NA (Please explain.)**
Comments:

- *Samples TP1-4, TP1-5, TP2-3, TP2-39, TP-3-2, TP3-29, TP5-2, TP6-1, TP6-3, TP7-1, and TP7-3 surrogate recoveries for 4-bromofluorobenzene do not meet QC criteria due to matrix interference.*
- *TP7-3: PAH surrogate recovery for 2-Methylnaphthalene-d10 and Fluoranthene-d10 does not meet QC criteria due to matrix interference.*
- *LCS – 8270D surrogate recovery for trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.*
- *PAH MS/MSD recovery for several analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.*
- *MS – 8260C recoveries for trichlorofluoromethane and hexachlorobutadiene do not meet QC criteria.*
- *MS recoveries for several analytes do not meet QC criteria. Refer to LCS/LCSD for accuracy*
- *8260C - MSD RPD for trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the parent sample.*
- *8021B -MSD recoveries for several analytes do not meet QC criteria. Refer to LCS/LCSD for accuracy*

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

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

5. Sample Results

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

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

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

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

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

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis, and 20 samples?
Yes / No / NA (Please explain.)
Comments:

ii. All method blank results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

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

iv. Do the affected sample(s) have data flags? **Yes / No / NA**
Comments:

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

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

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples?
(LCS/LCSD required per AK methods, LCS required per SW846) **Yes / No / *NA* (Please explain.)**
Comments:

ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes / No / NA (Please explain.)**
Comments: *Samples were not analyzed for metals/inorganics.*

iii. Accuracy – All percent recoveries (%R) reported *and w*ithin method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

- *LCS recovery for trichlorofluoromethane (213%) does not meet QC criteria of 62% to 140%.*

iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes / No / NA (Please explain.)**
Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected? ***NA***
Comments: *Samples TP3-2, TP3-29, TP6-3, and TP7-3.*

vi. Do the affected samples(s) have data flags? **Yes / No / NA**
Comments: *See above.*

If so, are the data flags clearly defined? **Yes / No / NA**
Comments: *See above.*

vii. Data quality or usability affected? Explain. ***NA***
Comments*: Trichlorofluoromethane was not detected in the associated samples. Therefore, data quality is not affected.*

c. Surrogates - Organics Only

i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes / No / NA (Please explain.)**
Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes / No / NA (Please explain.)**
Comments:

- *Recovery of GRO surrogate 4-bromofluorobenzene for Project Samples TP1-4, TP1-5, TP2-3, TP2-39, TP3-2, TP3-29, TP5-2, TP6-1, TP6-3, TP7-1, and TP7-3 are above QC criteria.*
- *Recovery of PAH surrogates 2-Methylnaphthalene-d10 and Fluoranthene-d10 for Project Sample TP7-3 are below QC criteria.*

iii. Do the sample results with failed surrogate recoveries have data flags? **Yes / No / NA (Please explain.)**
Comments: *Project samples affected by surrogate recovery failures due to matrix interference are flagged "J+"(GRO) and "J-"(PAHs) on Table 2 of the report.*

If so, are the data flags clearly defined? **Yes / No / NA**
Comments:

iv. Data quality or usability affected? Explain.
Comments: *The flagged data are considered potentially biased high (GRO) and biased low (PAHs).*

d. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.)

i. One trip blank reported per matrix, analysis and cooler? **Yes / No / NA (Please explain.)**
Comments:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA (Please explain if NA or no.)**
Comments: *One trip blank, designated Trip Blank 01, was submitted to the laboratory with the project samples*

iii. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

iv. If above LOQ, what samples are affected? **NA**
Comments**:**

v. Data quality or usability affected? Explain.
Comments: *Data quality/usability are unaffected; see above.*

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA (Please explain.)
Comments:

ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA (Please explain.)**
Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs?
(Recommended: 30% for water, 50% for soil) **Yes / No / NA (Please explain.)**
Comments:

iv. Data quality or usability affected? Explain. ***NA***
Comments:

f. Decontamination or Equipment Blank (if not applicable, a comment stating why must be entered below)
Yes / No / NA (Please explain.)
Comments: *A decontamination or equipment blank was not included in our ADEC-approved work plan.*

i. All results less than LOQ? **Yes / No / NA (Please explain.)**
Comments:

ii. If results are above LOQ, what samples are affected? ***NA***
Comments:

iii. Data quality or usability affected? Explain. ***NA***
Comments:

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

a. Are they defined and appropriate? **Yes / No / NA**
Comments: *Laboratory-specific flags are defined on page 4 of the SGS report.*

APPENDIX E

ADEC CONCEPTUAL SITE MODEL

Print Form

Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name: Shishmaref Native Store

File Number: 530.38.006

Completed by: Matt Woods, Shannon & Wilson, Inc.

Introduction

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

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

1. General Information:

Sources *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☒ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☒ Other: Fuel transfer location (marine header), piping

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

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

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

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

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

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

* bgs - below ground surface

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

a) Direct Contact -

1. Incidental Soil Ingestion

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

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

Comments:

Petroleum hydrocarbons (GRO and DRO), VOCs, and PAHs have been detected in soil samples collected at the site.

2. Dermal Absorption of Contaminants from Soil

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

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

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

Comments:

Constituents listed in Appendix B were detected at the site at concentrations below ADEC cleanup levels. However, 1-methylnaphthalene and naphthalene are above 1/10th the cleanup level and therefore exposure may be considered significant.

b) Ingestion -

1. Ingestion of Groundwater

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

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

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

Comments:

Permafrost encountered during site investigation, groundwater (suprapermafrost water) not documented. The village of Shishmaref uses snow melt water as their drinking water source.

2. Ingestion of Surface Water

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

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

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

Comments:

There is a potential that contaminants could migrate from the site to the Chuckchi Sea, however it cannot be used as a drinking water source.

3. Ingestion of Wild and Farmed Foods

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

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

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

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

Comments:

According to the ADEC contaminated site database, residents have in the past used the section of shoreline beneath the marine header for subsistence fishing.

c) Inhalation-

1. Inhalation of Outdoor Air

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

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

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

Comments:

Xylenes, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, 4-Isopropyltoluene have been detected in soil samples collected a the site at concentrations above the applicable ADEC inhalation cleanup levels. Other volatile compounds have also been detected, but below the ADEC cleanup level.

2. Inhalation of Indoor Air

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

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

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

Comments:

The Shishmaref Native Store is constructed on pilings with a partially enclosed air space, and the pathway is considered potentially complete, and the Warehouse has a sub-grade cellar and the pathway is considered complete. See ADEC Indoor Air Quality Surveys for details.

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

Dermal Exposure to Contaminants in Groundwater and Surface Water

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

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

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

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

Comments:

Inhalation of Volatile Compounds in Tap Water

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

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

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

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

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

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

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

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

Comments:

Analytes detected in near-surface soil samples are limited to volatile compounds.

Direct Contact with Sediment

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

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

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

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

Comments:

While at the site Shannon and Wilson observed recreational activities, children playing, at the site.

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

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Shishmaref Native Store

Completed By: Matt Woods

Date Completed: 1/22/2019

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

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

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

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

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

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

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Current & Future Receptors: Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil — check soil	☑ soil	☑ Incidental Soil Ingestion		C/F	C/F	C/F	C/F		
	☑ Migration to subsurface — check soil		☑ Dermal Absorption of Contaminants from Soil		C/F	C/F	C/F	C/F		
	☐ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☑ Volatilization — check air	☐ groundwater	☐ Ingestion of Groundwater							
	☑ Runoff or erosion — check surface water		☐ Dermal Absorption of Contaminants in Groundwater							
	☐ Uptake by plants or animals — check biota		☐ Inhalation of Volatile Compounds in Tap Water							
	☐ Other (list):	☑ air	☑ Inhalation of Outdoor Air		C/F	C/F	C/F	C/F		
☑ Subsurface Soil (2-15 ft bgs)	☑ Direct release to subsurface soil — check soil		☑ Inhalation of Indoor Air		C/F	C/F	F			
	☐ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☑ Volatilization — check air	☑ surface water	☐ Ingestion of Surface Water							
	☐ Uptake by plants or animals — check biota		☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Other (list):		☐ Inhalation of Volatile Compounds in Tap Water							
☐ Ground-water	☐ Direct release to groundwater — check groundwater	☑ sediment	☑ Direct Contact with Sediment			C/F		C/F		
	☐ Volatilization — check air	☑ biota	☑ Ingestion of Wild or Farmed Foods			C/F		C/F	C/F	
	☐ Flow to surface water body — check surface water									
	☐ Flow to sediment — check sediment									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Surface Water	☑ Direct release to surface water — check surface water									
	☐ Volatilization — check air									
	☑ Sedimentation — check sediment									
	☑ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Sediment	☑ Direct release to sediment — check sediment									
	☐ Resuspension, runoff, or erosion — check surface water									
	☑ Uptake by plants or animals — check biota									
	☐ Other (list):									

Revised, 10/01/2010

APPENDIX F

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

Attachment to and part of Report 32-1-20017

Date: February 2019
To: ANICA, Inc

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland