

February 5, 2021

Mr. Eric Hershey, P.E.
Alaska Department of Transportation and Public Services
2200 East 42nd Avenue
Anchorage, Alaska 99508

RE: ADDITIONAL SITE CHARACTERIZATION AND MONITORING WELL
 DECOMMISSIONING ACTIVITIES, LOT 1A, BLOCK 100, PORT HEIDEN AIRPORT,
 PORT HEIDEN, ALASKA; ADEC FILE NUMBERS 2637.26.002 AND 2637.57.002

Dear Mr. Hershey:

This report presents the results of Shannon & Wilson's additional site characterization and well decommissioning activities conducted at Lot 1A, Block 100, Port Heiden Airport. A warehouse, fuel tanks, and pump house were formerly located at the site. A concrete pad formerly used for storage is located east of the former warehouse. A vicinity map, site plan, and detailed site plan are included as Figures 1, 2, and 3, respectively.

The project was conducted in general accordance with our July 13, 2020 work plan which was approved by Grant Lidren of the Alaska Department of Environmental Conservation (ADEC) in an email dated July 15, 2020.

BACKGROUND

Two ADEC listed contaminated sites, identified as "*Frosty Fuels Inc. – Port Heiden*" (ADEC File Nos. 2637.26.002 and 2637.57.002, Hazard ID 23200) and "*ADOT&PF Port Heiden Airport, Block 1A, Lot 100*" (ADEC File No. 2637.57.002, Hazard ID 25437), are located at the property. According to the ADEC contaminated sites database, the Frosty Fuels site has been granted a Cleanup Complete with Institutional Controls by the ADEC. The ADOT&PF Port Heiden Airport site is listed as an active contaminated site.

As documented in our December 7, 2018 *Groundwater Monitoring, Lot 1A, Block 100, Port Heiden Airport, Port Heiden, Alaska; ADEC File No. 2637.26.002* report, six groundwater monitoring wells (MW-4, MW-7, MW-11, MW-18, MW-22, and MW-39) were identified at the site during an October 2018 site visit. The wells were previously installed as part of the assessment of the Frosty Fuels site. The approximate well locations are shown on Figure 2. It is our understanding that the ADEC has requested decommissioning of the wells.

As documented in the August 2010 *Port Heiden Airport – Former Frosty Fuels Tank Farm and Old Reeve Warehouse, Property Assessment and Cleanup Plan* prepared by Hoefler Consulting Group, petroleum-impacted soil was identified in two soil samples (PHASS01 and PHASS03) collected in 2009. Sample PHASS01 was collected from windblown soil particles on the surface of the concrete pad, beneath a leaking drum. Sample PHASS03 was collected from surface soil, potentially impacted by another leaking drum. The soil samples contained concentrations of diesel range organics (DRO), residual range organics (RRO), 1-methylnaphthalene, and/or naphthalene exceeding the current ADEC Method Two cleanup levels. In addition, polychlorinated biphenyls (PCBs) were detected at concentrations less than the ADEC Method Two cleanup level in Sample PHASS02, which was collected south of Sample PHASS01 adjacent to the concrete pad, and Sample PHASS03. The approximate sample locations are shown on Figure 3. The report recommended:

- collecting and analyzing additional samples from the site for PCBs,
- excavating PCB-impacted soil, if identified,
- excavating petroleum-impacted soil identified north of the concrete pad,
- disposing of drums, batteries, and debris,
- cleanup of the petroleum spill observed on the concrete pad, and
- conducting additional groundwater sampling.

In a letter dated November 8, 2016, the ADEC requested that the ADOT&PF address the recommendations presented in the Property Assessment and Cleanup Plan (PACP) and install additional groundwater monitoring wells at the site.

FIELD ACTIVITIES

The project consisted of decommissioning monitoring wells, advancing one test pit, collecting analytical soil samples, and handling investigation-derived waste (IDW). B.C. Excavating, LLC (BCX) provided an operator to advance the test pit using a rented local backhoe. SGS North America, Inc. (SGS) provided analytical testing of the soil samples.

As noted in the project work plan, drums, batteries, and debris were observed at the site during the PACP field activities. In addition, stained soil was observed at Samples PHASS01 and PHASS03. These items and stains were not observed during our 2020 site activities.

Monitoring Well Decommissioning Activities

Monitoring Wells MW-4, MW-7, MW-18, MW-22, and MW-39 were decommissioned in accordance with the ADEC's September 2013 *Monitoring Well Guidance* document using hand tools. Shannon & Wilson and BCX excavated around the wells in order to cut the polyvinyl chloride (PVC) well casings off approximately 1 foot below ground surface (bgs). Silica sand was placed in the wells to about 0.5 foot above the top of the well screens. Hydrated bentonite chips were then placed on top of the silica sand in the well casings to within about 1 foot of the ground surface. The ground surface was repaired with native soil to match the surrounding grade.

Upon arrival to the site, the well monument for Well MW-11 was missing and the well was filled with soil. To facilitate the decommissioning process, soil was removed from the casing to about 1 foot bgs, and the casing was cut down to approximately 1 foot bgs. The ground surface was repaired to match the surrounding grade.

Test Pits and Soil Sampling

The utility locate center was contacted to mark buried utilities within the project area and identify potential conflicts such that the locations of the proposed test pits could be adjusted, if necessary. Upon arrival in Port Heiden, the Shannon & Wilson representative also met with a local utility locator to mark approximate locations of buried utilities at the site. Buried power and telephone lines were marked in the vicinity of proposed Test Pits TP3 through TP6, TP8, and TP9. The approximate locations of the buried utilities are shown on Figure 3.

One test pit, designated Test Pit TP1, was advanced to a depth of approximately 6 feet below ground surface (bgs). The test pit was advanced adjacent to the concrete slab in the approximate location of Sample PHASS02 collected in 2009. Groundwater was not encountered in the test pit. While advancing Test Pit TP1, buried metal debris and unmarked/unlabeled 55-gallon drums were encountered from approximately 4 to 6 feet bgs. The drums were rusted, not fully intact, and did not contain liquids. The ADOT&PF project manager was notified, and the decision was made to not advance the remainder of the proposed test pits, due to the presence of the drums and the on-site utilities.

Field screening samples were collected from the test pit at approximately 1-foot intervals until the base of the test pit. Each 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 was opened slightly, the instrument probe was inserted into the air space above the soil, and the bag was 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.

Two analytical soil samples from the test pit were submitted for laboratory analysis. The samples were collected from the sample intervals with the highest PID measurements. 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-weighted, 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.

Investigation-Derived Waste Management

IDW consisted of excavated soil, drums, metal debris generated while advancing Test Pit TP1, and well materials (casings and protective monuments) generated during the well decommissioning activities. The soil was used to backfill the test pit and the well materials were removed from the site and disposed as unregulated solid waste. The drums and metal debris were crushed and placed in a supersack, labeled, and stored onsite pending future disposal by others.

LABORATORY ANALYSIS

The soil samples were submitted to SGS for analytical testing, using chain-of-custody procedures. One primary and field duplicate sample set were analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101, DRO by AK 102, RRO by AK 103, VOCs by Environmental Protection Agency (EPA) Method 8260D, Metals by EPA Method 6020B, PCBs by EPA Method 8082A, and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM. An additional sample was collected and analyzed for DRO by AK 102, RRO by AK 103, and PCBs by EPA Method 8082A. The laboratory reports and completed ADEC Laboratory Data Review Checklists (LDRCs) are provided in Attachment 3. The analytical soil sample results are summarized in Table 2.

SUBSURFACE CONDITIONS

The subsurface soil at the site generally consists of well-graded sand with gravel. Metal debris including 55-gallon drums were encountered from about 4 to 6 feet bgs in Test Pit TP1. Groundwater was not encountered in the test pit.

DISCUSSION OF ANALYTICAL RESULTS

The analytical soil results were compared to ADEC cleanup levels presented in the November 2020, 18 Alaska Administrative Code (AAC) 75 regulations. The applicable soil criteria consist of the most stringent ADEC Method Two cleanup levels listed in Tables B1 and B2 of 18 AAC 75.341, for the “under 40-inch (precipitation) zone.” The applicable soil and cleanup levels are listed in Table 2.

Arsenic (maximum 2.91 mg/kg) was detected in duplicate Samples TP1S5/TP1S15 at concentrations greater than the ADEC cleanup levels of 0.2 mg/kg. However, in our opinion, these concentrations are likely consistent with background arsenic concentrations. DRO (maximum 16.2 J mg/kg), RRO (maximum 95.7 mg/kg), PCBs (maximum 0.211 mg/kg), barium (maximum 43.1 mg/kg), cadmium (0.0773 J mg/kg), chromium (3.58 mg/kg), and lead (maximum 7.82 mg/kg) were also detected in one or more soil samples at concentrations less than the most stringent ADEC Method Two cleanup levels of 250 mg/kg, 11,000 mg/kg, 1.0 mg/kg, 2,100 mg/kg, 9.1 mg/kg, 100,000 mg/kg, and 400 mg/kg, respectively. The remaining tested analytes were not detected.

QUALITY ASSURANCE SUMMARY

The project laboratory follows on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project include surrogates, method blanks, matrix spike/matrix spike duplicates (MS/MSD), and laboratory control sample/laboratory control sample duplicates (LCS/LCSD) to assess precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a brief narrative concerning the problem in the case narrative of their laboratory reports (see Attachment 3).

Field quality control samples included a field duplicate soil sample set. One duplicate soil (TP1S5/TP1S15) set was collected to assess precision of the sampling and analysis processes using the calculated relative percent difference (RPD). All of the RPDs are within the ADEC recommended DQO of 50 percent for soil.

An estimated concentration of GRO was detected in the method blank associated with Samples TP1S5 and TP1S15. Samples are flagged “B” in Table 2 when the reported sample concentration is within 10 times the reported method blank concentration. Estimated concentrations of GRO were detected in Samples TP1S5 and TP1S15 at levels less than the LOQ; therefore, the sample concentrations are flagged “B” and reported as non-detect at the LOQ.

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 for each data package, which is included in Attachment 3. No non-conformances that would adversely affect the quality or usability of the data were noted, with the exceptions discussed above.

CONCLUSIONS

Project activities consisted of decommissioning six wells, advancing one test pit, and collecting soil samples. Arsenic concentrations exceeding the most stringent ADEC Method Two cleanup levels were detected in duplicate Samples TP1S5/TP1S15. However, in our opinion, these concentrations are consistent with background arsenic concentrations. The remaining tested analytes were either not detected or were reported at concentrations less than the ADEC cleanup levels. Due to the presence of buried utilities and metal drums/debris, the remaining test pits and groundwater monitoring wells could not be advanced or completed.

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 characterization. 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 Attachment 4, "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 (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.

Sincerely,

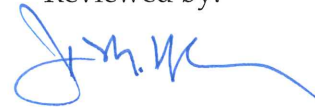
SHANNON & WILSON

Prepared by:



Alec J. Rizzo
Environmental Staff

Reviewed by:



Dan P. McMahon, PMP
Senior Associate

Enc. Tables 1 and 2; Figures 1 through 3; and Attachments 1 through 4

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 3)	Depth (feet) ^^	Headspace (ppm) ^	Sample Description
Soil Samples					
Test Pit TP1					
TP1S1	11/5/2020	Test Pit TP1, Sample S1	0-1	2.0	Brown, well graded sand with gravel; moist
* TP1S2	11/5/2020	Test Pit TP1, Sample S2	1-2	2.3	Brown, well graded sand with gravel; moist
TP1S3	11/5/2020	Test Pit TP1, Sample S3	2-3	2.2	Brown, well graded sand with gravel; moist
TP1S4	11/5/2020	Test Pit TP1, Sample S4	3-4	1.9	Brown, well graded sand with gravel; moist
* TP1S5	11/5/2020	Test Pit TP1, Sample S5	4-5	2.9	Brown, well graded sand with gravel; moist; metal debris
* TP1S15	11/5/2020	Duplicate of Sample TP1-S5	4-5	2.9	Brown, well graded sand with gravel; moist; metal debris
TP1S6	11/5/2020	Test Pit TP1, Sample S6	5-6	2.0	Brown, well graded sand with gravel; moist; metal debris

Notes:

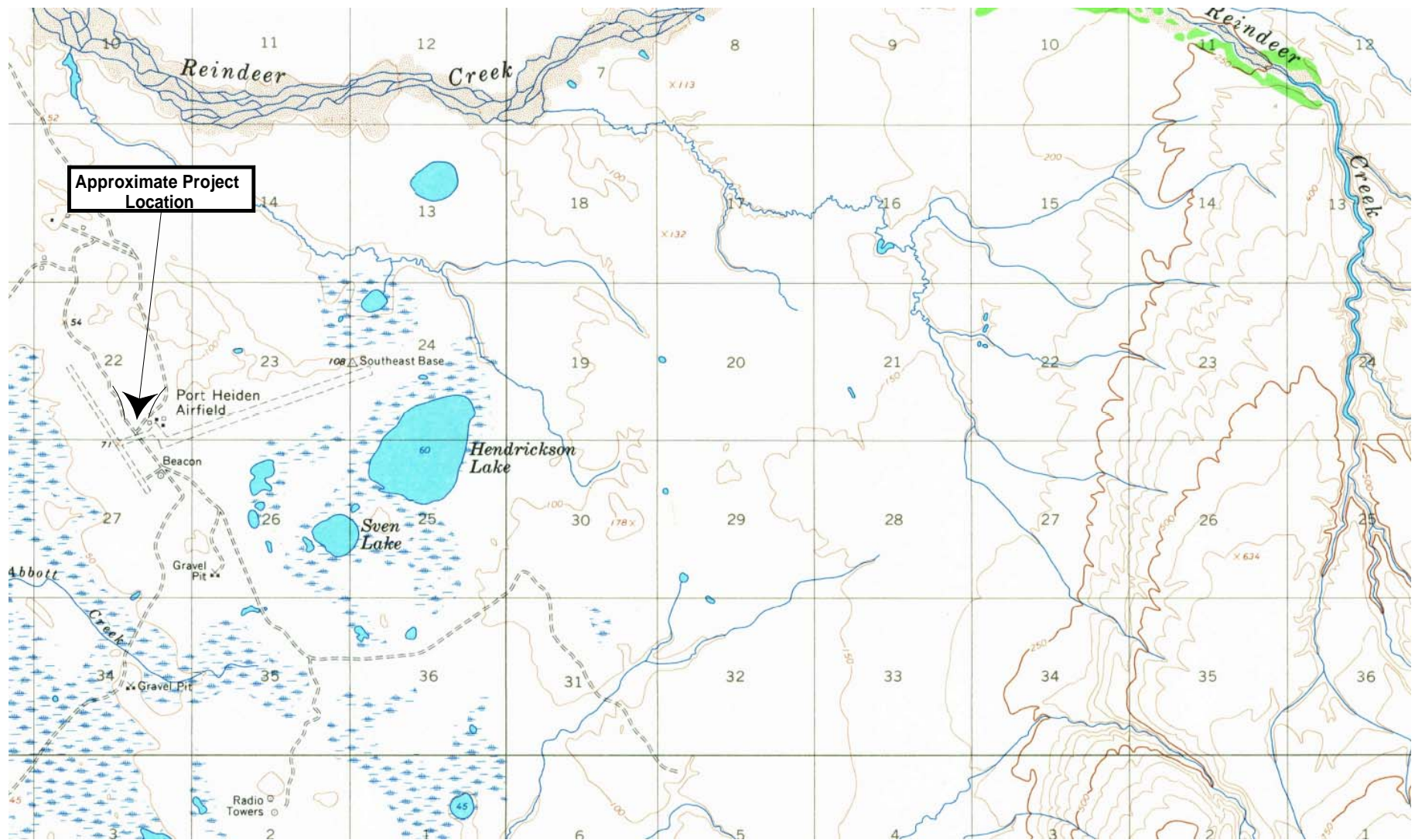
- * = Sample analyzed by the project laboratory (See Table 2)
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ^^ = Depth of soil samples are measured below ground surface.
- bgs = below ground surface
- ppm = parts per million

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number^ and Soil Sample Depth in Feet bgs (See Table 1 and Figure 3)		
			Test Pit Soil Samples		
			TP1S2 1-2	TP1S5 4-5	TP1S15~ 4-5
PID Headspace Reading - ppm	OVM 580B	-	2.3	2.9	2.9
Gasoline Range Organics (GRO) - mg/kg	AK 102	300	-	<4.89 B	<5.16 B
Diesel Range Organics (DRO) - mg/kg	AK 102	250	10.9 J	16.2 J	14.8 J
Residual Range Organics (RRO) - mg/kg	AK 103	11,000	80.6 J	95.7 J	82.7 J
Volatile Organic Compounds (VOCs)					
Benzene - mg/kg	EPA 8260D	0.022	-	<0.0123	<0.0129
Toluene - mg/kg	EPA 8260D	6.7	-	<0.0244	<0.0258
Ethylbenzene - mg/kg	EPA 8260D	0.13	-	<0.0244	<0.0258
Xylenes (total) - mg/kg	EPA 8260D	1.5	-	<0.0735	<0.0775
Other VOC Analytes - mg/kg	EPA 8260D	Various	-	ND	ND
Polychlorinated Biphenyls (PCBs)					
Arochlor-1260 - mg/kg	EPA 8082A	1.0	0.176	0.211	0.183
Other PCB Analytes - mg/kg	EPA 8082A	1.0	ND	ND	ND
Metals- mg/kg					
Arsenic - mg/kg	EPA 6020A	0.20	-	2.91	2.48
Barium - mg/kg	EPA 6020A	2,100	-	41.6	43.1
Cadmium - mg/kg	EPA 6020A	9.1	-	<0.118	0.0773 J
Chromium - mg/kg	EPA 6020A	100,000^^	-	3.58	3.58
Lead - mg/kg	EPA 6020A	400	-	7.82	7.30
Mercury - mg/kg	EPA 6020A	0.36	-	<0.177	<0.174
Selenium - mg/kg	EPA 6020A	6.9	-	<0.590	<0.580
Silver - mg/kg	EPA 6020A	11	-	<0.295	<0.290
Polynuclear Aromatic Hydrocarbons (PAHs) - mg/kg	EPA 8270D SIM	Various	-	ND	ND

Notes:


- * = See Attachment 3 for compounds tested, methods, and laboratory reporting limits
- ** = Soil cleanup level is the most stringent ADEC Method 2 standard listed in Table B1 or B2, 18 AAC 75 (November 2020), for the "under 40 inches (precipitation) zone"
- ^ = Sample ID number preceded by "101644-" on the chain of custody form
- ^^ = Cleanup level for chromium III; there are no known sources of chromium VI at the site.
- mg/kg = Milligram per kilogram
- PID = Photoionization detector
- <0.0123 = Analyte not detected; laboratory limit of detection of 0.0123 mg/kg
- 10.9** = Analyte detected
- 2.91** = Reported concentration exceeds the ADEC cleanup level
- = Not applicable or sample not tested for this analyte
- J = Estimated concentration less than the limit of quantitation. See the SGS laboratory report for more details.
- B = Analyte concentration is potentially affected by method blank detection.
See ADEC Laboratory Data Review Checklist for details.
- bgs = below ground surface
- ppm = part per million
- ~ = Duplicate sample of TP1S5



Elevation in Feet
 Contour Interval 50 Feet
 Taken from Chignik D-2
 U.S. Geological Survey Quadrangle

NOT TO SCALE





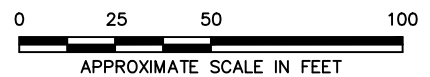
Lot 1A, Block 100, Port Heiden Airport Port Heiden, Alaska	
VICINITY MAP	
February 2021	101644-002
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	FIG. 1




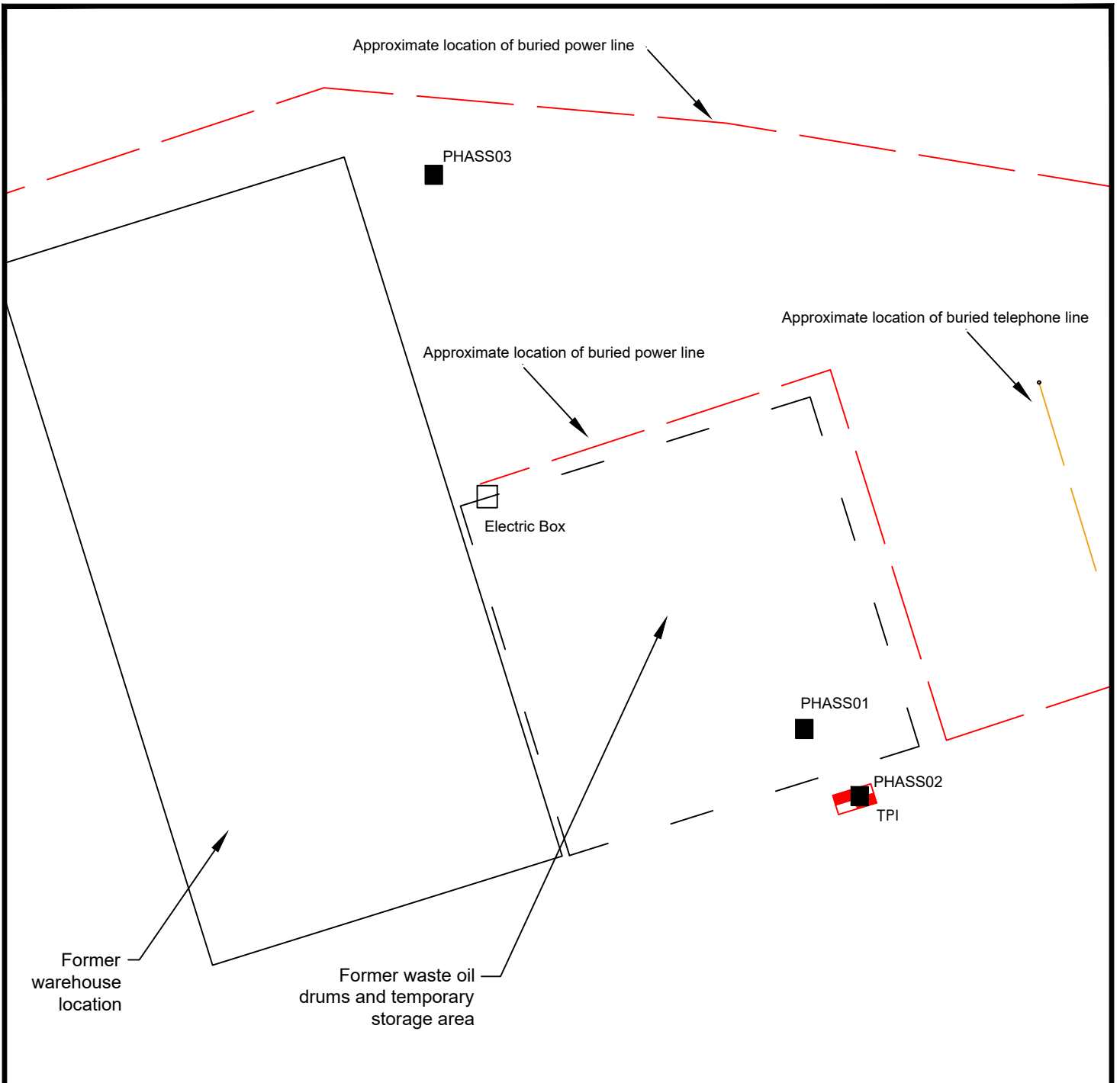
Aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth Mapping Service.

LEGEND


- 
 MW-2 Approximate location of former Monitoring Well W-2.
- 
 MW-4 Approximate location of Monitoring Well MW-4, decommissioned on November 4, 2020.




LOT 1A, BLOCK 100, PORT HEIDEN AIRPORT PORT HEIDEN, ALASKA	
SITE PLAN	
February 2021	101644-002
 SHANNON & WILSON, INC. <small>Geotechnical & Environmental Consultants</small>	FIG. 2




LEGEND

PHASS001
 Approximate location of Sample PHASS001 collected on October 29, 2009 by Hoefler, Consulting Group

 Approximate location of Test Pit TP1 advanced by Shannon & Wilson on November 5, 2020
 TPI



LOT 1A, BLOCK 100, PORT HEIDEN AIRPORT PORT HEIDEN, ALASKA	
DETAILED SITE PLAN	
February 2021	101644-002
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	FIG. 3

ATTACHMENT 1

Site Photographs



Photo 1: Looking south at the advancement of Test Pit TP1. (November 5, 2020)



Photo 2: Looking south into Test Pit TP1. Metal debris were encountered between approximately 4 to 6 feet bgs. (November 5, 2020)

Lot1A, Block 100, Port Heiden Airport
Port Heiden, Alaska

PHOTOS 1 AND 2

February 2021

101644-002



SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants



Photo 3: Looking southeast at the metal debris and 55-gal drums removed from Test Pit TP1.
(November 5, 2020)

Lot 1A, Block 100, Port Heiden Airport
Port Heiden, Alaska

PHOTO 3

February 2021

101644-002



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Geotechnical & Environmental Consultants

ATTACHMENT 2

Field Notes

11/2/20

~~Arrive at~~ ~~Left at~~

0800 Arrive @ Lake Clark Air, Await
Departure to Port Heiden

1030 Depart Anchorage

1300 Arrive in Port Heiden → meet
with Derek to get equipment.

1400 Begin finding monitoring wells
@ frosty fuels site and coordinating
with Locakes / village for Jozz
site.

1700 End of day

11/3/20

0830 Arrive at ADOT Building → begin
locating wells. Calibrate P10

0930 Louker Arrives to locate @ DOT +
Frosty Fuels site

1030 Begin getting DTW @ MW at
DOT Building

		<u>DTW</u>	<u>DTB</u>
1045	MW-1	10.91	16.21

1054	MW-2	10.33	15.80
------	------	-------	-------

1055	MW-3	11.15	16.32
------	------	-------	-------

1120 Begin Advancing TP-9

1320 Begin installing MW-4 in TP-9

1400 Finish installing MW-4.

1405 Begin advancing TP-7

1545 Begin advancing TP-8

1600 Begin backfilling TP-7.

1700 Finish backfilling TP-7

1728 Begin Advancing TP-4

1815 Begin backfilling TP-8 → will
do a separate test pit 20 ft
to south tomorrow

1900 End of day

11/4/20

- 0800 Arrive onsite. Start Excavator to let warm. Calibrate PDS
- 0845 Begin advancing TP-10, step out test pit from TP-4, ~20 ft to south.
- 0940 Begin Advancing TP-6.
- 1030 Finish w/ TP-4, begin backfilling TP-10. Plan to install MW in TP-4.
- 1040 Finish backfilling TP-10, begin installing MW in TP-4
- 1130 Finish installing MW-5, begin advancing TP-5.
- 1245 Begin backfilling TP-5 + TP-6
- 1400 Finish with ADOT + DF maintenance bridge work → head to Frosty fields
- 1415 Begin decommissioning wells
MW-39 DTW DTB
 13.34
- 1410 MW-18 12.46 16.50
- 1500 MW-22 11.35 15.72
- 1520 Unsure of location of heaters @ site →

contact Saw staff/project manager to contact client about more information on underground utilities. Also talked to village staff about possible locations of power/LOHA lines.

1600 Continue decommissioning wells.

	<u>DTW</u>	<u>DTB</u>
MW-4	11.17	19.60

1630 Truck has issues and overheats → spend some time calling Scott (vehicle owner) to get fixed.

1715 Will get a new vehicle → continue decommissioning wells.

1730 MW-7 DTW DTB
 11.89 17.42

1818 1750 Arrive at MW-11. Cap^{well} is torn off likely due to snow plowing and is filled with sediment. Remove first 4 inches of soil^{AK} and (PVC) and cover with soil.

1830 End of day

Rite in the Rain.

11/5/20

Frosty Fields

- 830 Arrive onsite → calibrate PID,
turn on excavator, prep for sampling
- 910 Begin advancing TP-1.
- 920 Begin encountering metal debris +
drums in TP-1. Call project
manager to discuss what to
do next. Stop work.
- 1010 After talking w/ project manager
who discussed issue w/ client. Decision
was made to stop digging @ site,
collect soil samples from TP-1
and begin to backfill. Plan to
put metal debris in a supersack,
label it, and leave onsite.
- 1115 Finish backfilling TP-1. Placed
drums in a supersack + labeled
it. Begin walking excavator back
to DOT building (ARRF).
- 1130 Begin surveying wells + taking
swing ties (see figure) @ ABO
ARRF Building

MWDTWDTBTime

MW1

10.69

10.00

1318

MW2

10.34

15.80

~~1321~~

MW3

11.15

14.32

1324

MW4

11.40

15.10

1327

MW5

11.10

15.26

1338

1340 Begin Decoupling MW-5.

1720 Finish Decoupling / Sampling
MW-5. collected dup
MW-151800 Finish decoupling / cleaning
ups putting well caps on
all wells, and storing gear
for the night

1830 End of day

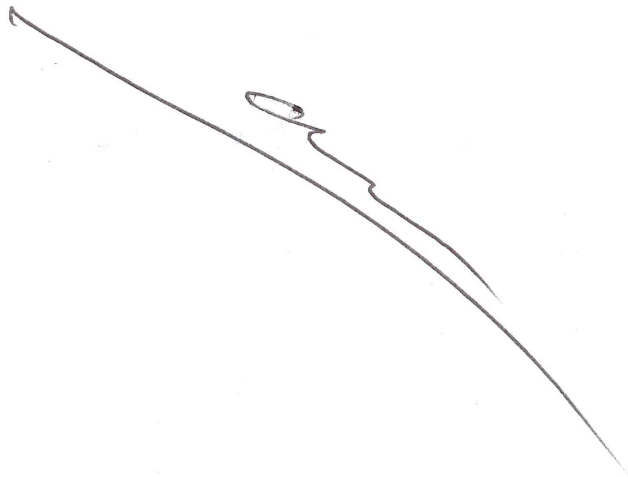
11/7/20

0800 Arrive at DOT shop → continue
packing gear and prepping for
departure

1400 Depart Port Haden for
Anchorage

1630 Arrive in Anchorage → head
to office to send straight
form for gear to ground
eviction

1730 End of Day



ATTACHMENT 3

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

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907)433-3223

Report Number: **1206171**

Client Project: **101644 Port Heiden FrostyFuels**

Dear Dan McMahon,

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 Justin 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.



Justin Nelson
2020.11.30
15:39:47 -09'00'

Justin Nelson
Project Manager
Justin.Nelson@sgs.com

Date

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1206171**
Project Name/Site: **101644 Port Heiden FrostyFuels**
Project Contact: **Dan McMahon**

Refer to sample receipt form for information on sample condition.

1206171002(1592559MS) (1592560) MS

6020B - Metals MS recovery for barium does not meet QC criteria. The post digestion spike was successful.

1206145001MS (1592960) MS

8082A - PCB Aroclors 1016/1260 MS recoveries do not meet QC criteria due to sample matrix. Refer to the LCS for accuracy requirements.

1206177005(1593090MS) (1593091) MS

8260D - MS recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements.

1206145001MSD (1592961) MSD

8082A - PCB Aroclors 1016/1260 MSD recoveries do not meet QC criteria due to sample matrix. Refer to the LCS for accuracy requirements.

1206177005(1593090MSD) (1593092) MSD

8260D - MSD recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements.

8260D - MS/MSD RPD for 1,2,3-trichlorobenzene does not meet QC criteria. This analyte was not detected above the LOQ in the parent sample.

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

Print Date: 11/30/2020 3:14:03PM

Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
SW8082A				
1592959	LCS for HBN 1814198 [XXX/44231	XGC10762	Aroclor-1016	SP
1593331	CCV for HBN 1814282 (XGC/10762	XGC10762	Aroclor-1016	SP
1593335	CCV for HBN 1814282 (XGC/10762	XGC10762	Aroclor-1016	SP
1593351	CCV for HBN 1814283 (XGC/10763	XGC10763	Aroclor-1016	SP
1593352	CCV for HBN 1814283 (XGC/10763	XGC10763	Aroclor-1016	SP
SW8260D				
1593091	1206177005(1593090MS)	VMS20487	tert-Butylbenzene	SP
1593092	1206177005(1593090MSD)	VMS20487	tert-Butylbenzene	SP
1593094	CCV for HBN 1814218 (VMS/20487	VMS20487	tert-Butylbenzene	SP
1593095	CVC for HBN 1814218 (VMS/20487	VMS20487	tert-Butylbenzene	SP

Manual Integration Reason Code Descriptions

Code	Description
O	Original Chromatogram
M	Modified Chromatogram
SS	Skimmed surrogate
BLG	Closed baseline gap
RP	Reassign peak name
PIR	Pattern integration required
IT	Included tail
SP	Split peak
RSP	Removed split peak
FPS	Forced peak start/stop
BLC	Baseline correction
PNF	Peak not found by software

All DRO/RRO analysis are integrated per SOP.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. The results apply to the samples as received. 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, indemnification 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, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. 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
TNTC	Too Numerous To Count
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.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
101644-TP1S2	1206171001	11/05/2020	11/09/2020	Soil/Solid (dry weight)
101644-TP1S5	1206171002	11/05/2020	11/09/2020	Soil/Solid (dry weight)
101644-TP1S15	1206171003	11/05/2020	11/09/2020	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
AK101	Gasoline Range Organics (S)
SW6020B	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's
SW8260D	VOC 8260 (S) Field Extracted

Print Date: 11/30/2020 3:14:07PM

Detectable Results Summary

Client Sample ID: **101644-TP1S2**

Lab Sample ID: 1206171001

**Polychlorinated Biphenyls
Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Aroclor-1260	176	ug/kg
Diesel Range Organics	10.9J	mg/kg
Residual Range Organics	80.6J	mg/kg

Client Sample ID: **101644-TP1S5**

Lab Sample ID: 1206171002

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	
Arsenic	2.91	mg/kg	
Barium	41.6	mg/kg	
Chromium	3.58	mg/kg	
Lead	7.82	mg/kg	
Polychlorinated Biphenyls	Aroclor-1260	211	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	16.2J	mg/kg
	Residual Range Organics	95.7J	mg/kg
Volatile Fuels	Gasoline Range Organics	1.49J	mg/kg

Client Sample ID: **101644-TP1S15**

Lab Sample ID: 1206171003

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	
Arsenic	2.48	mg/kg	
Barium	43.1	mg/kg	
Cadmium	0.0773J	mg/kg	
Chromium	3.58	mg/kg	
Lead	7.30	mg/kg	
Polychlorinated Biphenyls	Aroclor-1260	183	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	14.8J	mg/kg
	Residual Range Organics	82.7J	mg/kg
Volatile Fuels	Gasoline Range Organics	1.97J	mg/kg



Results of 101644-TP1S2

Client Sample ID: **101644-TP1S2**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171001
Lab Project ID: 1206171

Collection Date: 11/05/20 10:15
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):86.0
Location:

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	28.8 U	57.5	14.4	ug/kg	1		11/16/20 17:55
Aroclor-1221	57.5 U	115	28.7	ug/kg	1		11/16/20 17:55
Aroclor-1232	28.8 U	57.5	14.4	ug/kg	1		11/16/20 17:55
Aroclor-1242	28.8 U	57.5	14.4	ug/kg	1		11/16/20 17:55
Aroclor-1248	28.8 U	57.5	14.4	ug/kg	1		11/16/20 17:55
Aroclor-1254	28.8 U	57.5	14.4	ug/kg	1		11/16/20 17:55
Aroclor-1260	176	57.5	14.4	ug/kg	1		11/16/20 17:55
Surrogates							
Decachlorobiphenyl (surr)	85	60-125		%	1		11/16/20 17:55

Batch Information

Analytical Batch: XGC10762
Analytical Method: SW8082A
Analyst: LAW
Analytical Date/Time: 11/16/20 17:55
Container ID: 1206171001-A

Prep Batch: XXX44231
Prep Method: SW3550C
Prep Date/Time: 11/13/20 13:20
Prep Initial Wt./Vol.: 22.768 g
Prep Extract Vol: 5 mL



Results of **101644-TP1S2**

Client Sample ID: **101644-TP1S2**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171001
Lab Project ID: 1206171

Collection Date: 11/05/20 10:15
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):86.0
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	10.9 J	23.0	7.12	mg/kg	1		11/14/20 00:22
Surrogates							
5a Androstane (surr)	94.8	50-150		%	1		11/14/20 00:22

Batch Information

Analytical Batch: XFC15811
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/14/20 00:22
Container ID: 1206171001-A

Prep Batch: XXX44222
Prep Method: SW3550C
Prep Date/Time: 11/12/20 10:59
Prep Initial Wt./Vol.: 30.37 g
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	80.6 J	115	49.4	mg/kg	1		11/14/20 00:22
Surrogates							
n-Triacontane-d62 (surr)	97.5	50-150		%	1		11/14/20 00:22

Batch Information

Analytical Batch: XFC15811
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/14/20 00:22
Container ID: 1206171001-A

Prep Batch: XXX44222
Prep Method: SW3550C
Prep Date/Time: 11/12/20 10:59
Prep Initial Wt./Vol.: 30.37 g
Prep Extract Vol: 5 mL



Results of 101644-TP1S5

Client Sample ID: **101644-TP1S5**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171002
Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	2.91	1.18	0.366	mg/kg	10		11/13/20 12:27
Barium	41.6	0.354	0.111	mg/kg	10		11/13/20 12:27
Cadmium	0.118 U	0.236	0.0732	mg/kg	10		11/13/20 12:27
Chromium	3.58	0.472	0.153	mg/kg	10		11/13/20 12:27
Lead	7.82	0.236	0.0732	mg/kg	10		11/13/20 12:27
Mercury	0.177 U	0.354	0.118	mg/kg	10		11/13/20 12:27
Selenium	0.590 U	1.18	0.366	mg/kg	10		11/13/20 12:27
Silver	0.295 U	0.590	0.177	mg/kg	10		11/13/20 12:27

Batch Information

Analytical Batch: MMS10942
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 11/13/20 12:27
Container ID: 1206171002-A

Prep Batch: MX33823
Prep Method: SW3050B
Prep Date/Time: 11/11/20 09:52
Prep Initial Wt./Vol.: 1.006 g
Prep Extract Vol: 50 mL



Results of 101644-TP1S5

Client Sample ID: 101644-TP1S5
Client Project ID: 101644 Port Heiden FrostyFuels
Lab Sample ID: 1206171002
Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location:

Results by Polychlorinated Biphenyls

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Aroclor-1016 through Aroclor-1260 and Surrogates (Decachlorobiphenyl (surr)).

Batch Information

Analytical Batch: XGC10762
Analytical Method: SW8082A
Analyst: LAW
Analytical Date/Time: 11/16/20 18:06
Container ID: 1206171002-A

Prep Batch: XXX44231
Prep Method: SW3550C
Prep Date/Time: 11/13/20 13:20
Prep Initial Wt./Vol.: 22.551 g
Prep Extract Vol: 5 mL

Results of 101644-TP1S5

Client Sample ID: **101644-TP1S5**
 Client Project ID: **101644 Port Heiden FrostyFuels**
 Lab Sample ID: 1206171002
 Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
 Received Date: 11/09/20 13:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):84.2
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
2-Methylnaphthalene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Acenaphthene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Acenaphthylene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Anthracene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Benzo(a)Anthracene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Benzo[a]pyrene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Benzo[b]Fluoranthene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Benzo[g,h,i]perylene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Benzo[k]fluoranthene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Chrysene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Dibenzo[a,h]anthracene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Fluoranthene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Fluorene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Indeno[1,2,3-c,d] pyrene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Naphthalene	11.8 U	23.6	5.91	ug/kg	1		11/25/20 23:46
Phenanthrene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Pyrene	14.8 U	29.5	7.39	ug/kg	1		11/25/20 23:46
Surrogates							
2-Methylnaphthalene-d10 (surr)	79.7	58-103		%	1		11/25/20 23:46
Fluoranthene-d10 (surr)	81.1	54-113		%	1		11/25/20 23:46

Batch Information

Analytical Batch: XMS12421
 Analytical Method: 8270D SIM (PAH)
 Analyst: LAW
 Analytical Date/Time: 11/25/20 23:46
 Container ID: 1206171002-A

Prep Batch: XXX44219
 Prep Method: SW3550C
 Prep Date/Time: 11/11/20 14:20
 Prep Initial Wt./Vol.: 22.611 g
 Prep Extract Vol: 5 mL



Results of **101644-TP1S5**

Client Sample ID: **101644-TP1S5**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171002
Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	16.2 J	23.5	7.29	mg/kg	1		11/14/20 00:32

Surrogates

5a Androstane (surr)	93.5	50-150		%	1		11/14/20 00:32
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Batch Information

Analytical Batch: XFC15811
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/14/20 00:32
Container ID: 1206171002-A

Prep Batch: XXX44222
Prep Method: SW3550C
Prep Date/Time: 11/12/20 10:59
Prep Initial Wt./Vol.: 30.31 g
Prep Extract Vol: 5 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Residual Range Organics	95.7 J	118	50.6	mg/kg	1		11/14/20 00:32

Surrogates

n-Triacontane-d62 (surr)	95.7	50-150		%	1		11/14/20 00:32
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Batch Information

Analytical Batch: XFC15811
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/14/20 00:32
Container ID: 1206171002-A

Prep Batch: XXX44222
Prep Method: SW3550C
Prep Date/Time: 11/12/20 10:59
Prep Initial Wt./Vol.: 30.31 g
Prep Extract Vol: 5 mL

Results of 101644-TP1S5

Client Sample ID: **101644-TP1S5**
 Client Project ID: **101644 Port Heiden FrostyFuels**
 Lab Sample ID: 1206171002
 Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
 Received Date: 11/09/20 13:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):84.2
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.49 J	4.89	1.47	mg/kg	1		11/10/20 15:05
Surrogates							
4-Bromofluorobenzene (surr)	94.4	50-150		%	1		11/10/20 15:05

Batch Information

Analytical Batch: VFC15445
 Analytical Method: AK101
 Analyst: ALJ
 Analytical Date/Time: 11/10/20 15:05
 Container ID: 1206171002-C

Prep Batch: VXX36670
 Prep Method: SW5035A
 Prep Date/Time: 11/05/20 10:25
 Prep Initial Wt./Vol.: 37.576 g
 Prep Extract Vol: 30.9404 mL



Results of 101644-TP1S5

Client Sample ID: 101644-TP1S5
Client Project ID: 101644 Port Heiden FrostyFuels
Lab Sample ID: 1206171002
Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their corresponding test results.



Results of 101644-TP1S5

Client Sample ID: **101644-TP1S5**
 Client Project ID: **101644 Port Heiden FrostyFuels**
 Lab Sample ID: 1206171002
 Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
 Received Date: 11/09/20 13:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):84.2
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroethane	196 U	391	121	ug/kg	1		11/15/20 03:22
Chloroform	3.91 U	7.82	1.96	ug/kg	1		11/15/20 03:22
Chloromethane	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
cis-1,2-Dichloroethene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
cis-1,3-Dichloropropene	12.3 U	24.5	7.63	ug/kg	1		11/15/20 03:22
Dibromochloromethane	4.89 U	9.78	2.93	ug/kg	1		11/15/20 03:22
Dibromomethane	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
Dichlorodifluoromethane	48.9 U	97.8	29.3	ug/kg	1		11/15/20 03:22
Ethylbenzene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
Freon-113	98.0 U	196	60.6	ug/kg	1		11/15/20 03:22
Hexachlorobutadiene	19.6 U	39.1	12.1	ug/kg	1		11/15/20 03:22
Isopropylbenzene (Cumene)	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
Methylene chloride	98.0 U	196	60.6	ug/kg	1		11/15/20 03:22
Methyl-t-butyl ether	98.0 U	196	60.6	ug/kg	1		11/15/20 03:22
Naphthalene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
n-Butylbenzene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
n-Propylbenzene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
o-Xylene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
P & M -Xylene	48.9 U	97.8	29.3	ug/kg	1		11/15/20 03:22
sec-Butylbenzene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
Styrene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
tert-Butylbenzene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
Tetrachloroethene	12.3 U	24.5	7.63	ug/kg	1		11/15/20 03:22
Toluene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
trans-1,2-Dichloroethene	24.4 U	48.9	15.3	ug/kg	1		11/15/20 03:22
trans-1,3-Dichloropropene	12.3 U	24.5	7.63	ug/kg	1		11/15/20 03:22
Trichloroethene	4.89 U	9.78	2.93	ug/kg	1		11/15/20 03:22
Trichlorofluoromethane	48.9 U	97.8	29.3	ug/kg	1		11/15/20 03:22
Vinyl acetate	98.0 U	196	60.6	ug/kg	1		11/15/20 03:22
Vinyl chloride	0.780 U	1.56	0.489	ug/kg	1		11/15/20 03:22
Xylenes (total)	73.5 U	147	44.6	ug/kg	1		11/15/20 03:22
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	71-136		%	1		11/15/20 03:22
4-Bromofluorobenzene (surr)	94.1	55-151		%	1		11/15/20 03:22
Toluene-d8 (surr)	99	85-116		%	1		11/15/20 03:22

Results of 101644-TP1S5

Client Sample ID: **101644-TP1S5**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171002
Lab Project ID: 1206171

Collection Date: 11/05/20 10:25
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS20487
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/15/20 03:22
Container ID: 1206171002-C

Prep Batch: VXX36677
Prep Method: SW5035A
Prep Date/Time: 11/05/20 10:25
Prep Initial Wt./Vol.: 37.576 g
Prep Extract Vol: 30.9404 mL



Results of 101644-TP1S15

Client Sample ID: **101644-TP1S15**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171003
Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.8
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Arsenic	2.48	1.16	0.360	mg/kg	10		11/13/20 13:28
Barium	43.1	0.348	0.109	mg/kg	10		11/13/20 13:28
Cadmium	0.0773 J	0.232	0.0720	mg/kg	10		11/13/20 13:28
Chromium	3.58	0.464	0.151	mg/kg	10		11/13/20 13:28
Lead	7.30	0.232	0.0720	mg/kg	10		11/13/20 13:28
Mercury	0.174 U	0.348	0.116	mg/kg	10		11/13/20 13:28
Selenium	0.580 U	1.16	0.360	mg/kg	10		11/13/20 13:28
Silver	0.290 U	0.581	0.174	mg/kg	10		11/13/20 13:28

Batch Information

Analytical Batch: MMS10942
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 11/13/20 13:28
Container ID: 1206171003-A

Prep Batch: MX33823
Prep Method: SW3050B
Prep Date/Time: 11/11/20 09:52
Prep Initial Wt./Vol.: 1.015 g
Prep Extract Vol: 50 mL



Results of 101644-TP1S15

Client Sample ID: **101644-TP1S15**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171003
Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.8
Location:

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	29.0 U	58.0	14.5	ug/kg	1		11/16/20 18:16
Aroclor-1221	58.0 U	116	29.0	ug/kg	1		11/16/20 18:16
Aroclor-1232	29.0 U	58.0	14.5	ug/kg	1		11/16/20 18:16
Aroclor-1242	29.0 U	58.0	14.5	ug/kg	1		11/16/20 18:16
Aroclor-1248	29.0 U	58.0	14.5	ug/kg	1		11/16/20 18:16
Aroclor-1254	29.0 U	58.0	14.5	ug/kg	1		11/16/20 18:16
Aroclor-1260	183	58.0	14.5	ug/kg	1		11/16/20 18:16
Surrogates							
Decachlorobiphenyl (surr)	89	60-125		%	1		11/16/20 18:16

Batch Information

Analytical Batch: XGC10762
Analytical Method: SW8082A
Analyst: LAW
Analytical Date/Time: 11/16/20 18:16
Container ID: 1206171003-A

Prep Batch: XXX44231
Prep Method: SW3550C
Prep Date/Time: 11/13/20 13:20
Prep Initial Wt./Vol.: 22.844 g
Prep Extract Vol: 5 mL



Results of 101644-TP1S15

Client Sample ID: 101644-TP1S15
Client Project ID: 101644 Port Heiden FrostyFuels
Lab Sample ID: 1206171003
Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.8
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate standards with associated quality and detection data.

Batch Information

Analytical Batch: XMS12421
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 11/26/20 00:06
Container ID: 1206171003-A

Prep Batch: XXX44219
Prep Method: SW3550C
Prep Date/Time: 11/11/20 14:20
Prep Initial Wt./Vol.: 22.784 g
Prep Extract Vol: 5 mL



Results of 101644-TP1S15

Client Sample ID: 101644-TP1S15
Client Project ID: 101644 Port Heiden FrostyFuels
Lab Sample ID: 1206171003
Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.8
Location:

Results by Semivolatile Organic Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC15811
Analytical Method: AK102
Analyst: CDM
Analytical Date/Time: 11/14/20 00:42
Container ID: 1206171003-A

Prep Batch: XXX44222
Prep Method: SW3550C
Prep Date/Time: 11/12/20 10:59
Prep Initial Wt./Vol.: 30.285 g
Prep Extract Vol: 5 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Residual Range Organics and Surrogates (n-Triacontane-d62).

Batch Information

Analytical Batch: XFC15811
Analytical Method: AK103
Analyst: CDM
Analytical Date/Time: 11/14/20 00:42
Container ID: 1206171003-A

Prep Batch: XXX44222
Prep Method: SW3550C
Prep Date/Time: 11/12/20 10:59
Prep Initial Wt./Vol.: 30.285 g
Prep Extract Vol: 5 mL

Results of 101644-TP1S15

Client Sample ID: **101644-TP1S15**
 Client Project ID: **101644 Port Heiden FrostyFuels**
 Lab Sample ID: 1206171003
 Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
 Received Date: 11/09/20 13:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):84.8
 Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	1.97 J	5.16	1.55	mg/kg	1		11/10/20 14:47
Surrogates							
4-Bromofluorobenzene (surr)	91.2	50-150		%	1		11/10/20 14:47

Batch Information

Analytical Batch: VFC15445
 Analytical Method: AK101
 Analyst: ALJ
 Analytical Date/Time: 11/10/20 14:47
 Container ID: 1206171003-C

Prep Batch: VXX36670
 Prep Method: SW5035A
 Prep Date/Time: 11/05/20 10:40
 Prep Initial Wt./Vol.: 34.518 g
 Prep Extract Vol: 30.2296 mL



Results of 101644-TP1S15

Client Sample ID: 101644-TP1S15
Client Project ID: 101644 Port Heiden FrostyFuels
Lab Sample ID: 1206171003
Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.8
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various chemical compounds and their detection results.



Results of 101644-TP1S15

Client Sample ID: **101644-TP1S15**
 Client Project ID: **101644 Port Heiden FrostyFuels**
 Lab Sample ID: 1206171003
 Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
 Received Date: 11/09/20 13:11
 Matrix: Soil/Solid (dry weight)
 Solids (%):84.8
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Chloroethane	207 U	413	128	ug/kg	1		11/15/20 03:37
Chloroform	4.13 U	8.26	2.06	ug/kg	1		11/15/20 03:37
Chloromethane	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
cis-1,2-Dichloroethene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
cis-1,3-Dichloropropene	12.9 U	25.8	8.05	ug/kg	1		11/15/20 03:37
Dibromochloromethane	5.15 U	10.3	3.10	ug/kg	1		11/15/20 03:37
Dibromomethane	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
Dichlorodifluoromethane	51.5 U	103	31.0	ug/kg	1		11/15/20 03:37
Ethylbenzene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
Freon-113	103 U	206	64.0	ug/kg	1		11/15/20 03:37
Hexachlorobutadiene	20.6 U	41.3	12.8	ug/kg	1		11/15/20 03:37
Isopropylbenzene (Cumene)	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
Methylene chloride	103 U	206	64.0	ug/kg	1		11/15/20 03:37
Methyl-t-butyl ether	103 U	206	64.0	ug/kg	1		11/15/20 03:37
Naphthalene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
n-Butylbenzene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
n-Propylbenzene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
o-Xylene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
P & M -Xylene	51.5 U	103	31.0	ug/kg	1		11/15/20 03:37
sec-Butylbenzene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
Styrene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
tert-Butylbenzene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
Tetrachloroethene	12.9 U	25.8	8.05	ug/kg	1		11/15/20 03:37
Toluene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
trans-1,2-Dichloroethene	25.8 U	51.6	16.1	ug/kg	1		11/15/20 03:37
trans-1,3-Dichloropropene	12.9 U	25.8	8.05	ug/kg	1		11/15/20 03:37
Trichloroethene	5.15 U	10.3	3.10	ug/kg	1		11/15/20 03:37
Trichlorofluoromethane	51.5 U	103	31.0	ug/kg	1		11/15/20 03:37
Vinyl acetate	103 U	206	64.0	ug/kg	1		11/15/20 03:37
Vinyl chloride	0.825 U	1.65	0.516	ug/kg	1		11/15/20 03:37
Xylenes (total)	77.5 U	155	47.1	ug/kg	1		11/15/20 03:37
Surrogates							
1,2-Dichloroethane-D4 (surr)	100	71-136		%	1		11/15/20 03:37
4-Bromofluorobenzene (surr)	95.8	55-151		%	1		11/15/20 03:37
Toluene-d8 (surr)	98.5	85-116		%	1		11/15/20 03:37

Results of 101644-TP1S15

Client Sample ID: **101644-TP1S15**
Client Project ID: **101644 Port Heiden FrostyFuels**
Lab Sample ID: 1206171003
Lab Project ID: 1206171

Collection Date: 11/05/20 10:40
Received Date: 11/09/20 13:11
Matrix: Soil/Solid (dry weight)
Solids (%):84.8
Location:

Results by Volatile GC/MS

Batch Information

Analytical Batch: VMS20487
Analytical Method: SW8260D
Analyst: NRB
Analytical Date/Time: 11/15/20 03:37
Container ID: 1206171003-C

Prep Batch: VXX36677
Prep Method: SW5035A
Prep Date/Time: 11/05/20 10:40
Prep Initial Wt./Vol.: 34.518 g
Prep Extract Vol: 30.2296 mL

Method Blank

Blank ID: MB for HBN 1814111 [MXX/33823]
 Blank Lab ID: 1592557

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1206171002, 1206171003

Results by SW6020B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Arsenic	0.500U	1.00	0.310	mg/kg
Barium	0.150U	0.300	0.0940	mg/kg
Cadmium	0.100U	0.200	0.0620	mg/kg
Chromium	0.200U	0.400	0.130	mg/kg
Lead	0.100U	0.200	0.0620	mg/kg
Mercury	0.150U	0.300	0.100	mg/kg
Selenium	0.500U	1.00	0.310	mg/kg
Silver	0.250U	0.500	0.150	mg/kg

Batch Information

Analytical Batch: MMS10942
 Analytical Method: SW6020B
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 11/13/2020 12:18:08PM

Prep Batch: MXX33823
 Prep Method: SW3050B
 Prep Date/Time: 11/11/2020 9:52:27AM
 Prep Initial Wt./Vol.: 1 g
 Prep Extract Vol: 50 mL

Print Date: 11/30/2020 3:14:12PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [MXX33823]
 Blank Spike Lab ID: 1592558
 Date Analyzed: 11/13/2020 12:22

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by SW6020B

Parameter	Blank Spike (mg/kg)			CL
	Spike	Result	Rec (%)	
Arsenic	50	53.6	107	(82-118)
Barium	50	48.5	97	(86-116)
Cadmium	5	5.08	102	(84-116)
Chromium	20	21.6	108	(83-119)
Lead	50	56.8	114	(84-118)
Mercury	0.5	0.540	108	(74-126)
Selenium	50	55.4	111	(80-119)
Silver	5	5.28	106	(83-118)

Batch Information

Analytical Batch: **MMS10942**
 Analytical Method: **SW6020B**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **DMM**

Prep Batch: **MXX33823**
 Prep Method: **SW3050B**
 Prep Date/Time: **11/11/2020 09:52**
 Spike Init Wt./Vol.: 50 mg/kg Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:



Matrix Spike Summary

Original Sample ID: 1592559
MS Sample ID: 1592560 MS
MSD Sample ID: 1592561 MSD

Analysis Date: 11/13/2020 12:27
Analysis Date: 11/13/2020 12:32
Analysis Date: 11/13/2020 12:36
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1206171002, 1206171003

Results by SW6020B

Parameter	Sample	Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Arsenic	2.45	49.6	53	102	49.4	54.4	105	82-118	2.62	(< 20)
Barium	35.0	49.6	107	144 *	49.4	88.3	108	86-116	18.80	(< 20)
Cadmium	0.0995U	4.96	5.03	101	4.94	5.06	102	84-116	0.55	(< 20)
Chromium	3.02	19.8	23.1	101	19.8	24.7	110	83-119	6.59	(< 20)
Lead	6.59	49.6	62.2	112	49.4	61.1	110	84-118	1.74	(< 20)
Mercury	0.149U	0.496	.538	108	0.494	0.530	107	74-126	1.36	(< 20)
Selenium	0.497U	49.6	50.4	102	49.4	52.7	107	80-119	4.52	(< 20)
Silver	0.249U	4.96	5.27	106	4.94	5.18	105	83-118	1.76	(< 20)

Batch Information

Analytical Batch: MMS10942
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: DMM
Analytical Date/Time: 11/13/2020 12:32:14PM

Prep Batch: MXX33823
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 11/11/2020 9:52:27AM
Prep Initial Wt./Vol.: 1.01g
Prep Extract Vol: 50.00mL

Print Date: 11/30/2020 3:14:16PM

Bench Spike Summary

Original Sample ID: 1592559
 MS Sample ID: 1592562 BND
 MSD Sample ID:

Analysis Date: 11/13/2020 12:27
 Analysis Date: 11/13/2020 12:41
 Analysis Date:
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1206171002, 1206171003

Results by SW6020B

Parameter	Sample	Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Barium	35.0	249	275	97				75-125		

Batch Information

Analytical Batch: MMS10942
 Analytical Method: SW6020B
 Instrument: Perkin Elmer Nexlon P5
 Analyst: DMM
 Analytical Date/Time: 11/13/2020 12:41:39PM

Prep Batch: MXX33823
 Prep Method: Soils/Solids Digest for Metals by ICP-MS
 Prep Date/Time: 11/11/2020 9:52:27AM
 Prep Initial Wt./Vol.: 1.01g
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1814106 [SPT/11181]
Blank Lab ID: 1592545

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206171001, 1206171002, 1206171003

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT11181
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M
Analytical Date/Time: 11/10/2020 4:50:00PM

Print Date: 11/30/2020 3:14:18PM

Duplicate Sample Summary

Original Sample ID: 1206170009
Duplicate Sample ID: 1592546
QC for Samples:

Analysis Date: 11/10/2020 16:50
Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	81.7	82.7	%	1.10	(< 15)

Batch Information

Analytical Batch: SPT11181
Analytical Method: SM21 2540G
Instrument:
Analyst: H.M

Print Date: 11/30/2020 3:14:19PM

Duplicate Sample Summary

Original Sample ID: 1206170020

Duplicate Sample ID: 1592547

QC for Samples:

1206171001, 1206171002, 1206171003

Analysis Date: 11/10/2020 16:50

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	76.8	76.9	%	0.15	(< 15)

Batch Information

Analytical Batch: SPT11181

Analytical Method: SM21 2540G

Instrument:

Analyst: H.M

Print Date: 11/30/2020 3:14:19PM



Method Blank

Blank ID: MB for HBN 1814123 [VXX/36670]

Blank Lab ID: 1592610

QC for Samples:

1206171002, 1206171003

Matrix: Soil/Solid (dry weight)

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	0.782J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	92.4	50-150		%

Batch Information

Analytical Batch: VFC15445

Analytical Method: AK101

Instrument: Agilent 7890A PID/FID

Analyst: ALJ

Analytical Date/Time: 11/10/2020 11:50:00AM

Prep Batch: VXX36670

Prep Method: SW5035A

Prep Date/Time: 11/10/2020 6:00:00AM

Prep Initial Wt./Vol.: 50 g

Prep Extract Vol: 25 mL

Print Date: 11/30/2020 3:14:23PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [VXX36670]
 Blank Spike Lab ID: 1592611
 Date Analyzed: 11/10/2020 11:14

Spike Duplicate ID: LCSD for HBN 1206171 [VXX36670]
 Spike Duplicate Lab ID: 1592612
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by AK101

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	12.5	13.5	108	12.5	12.9	103	(60-120)	4.50	(< 20)

Surrogates

4-Bromofluorobenzene (surr)	1.25	98.4	98	1.25	96.8	97	(50-150)	1.60	
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Batch Information

Analytical Batch: **VFC15445**
 Analytical Method: **AK101**
 Instrument: **Agilent 7890A PID/FID**
 Analyst: **ALJ**

Prep Batch: **VXX36670**
 Prep Method: **SW5035A**
 Prep Date/Time: **11/10/2020 06:00**
 Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

Print Date: 11/30/2020 3:14:25PM

Method Blank

Blank ID: MB for HBN 1814217 [VXX/36677]

Blank Lab ID: 1593088

QC for Samples:

1206171002, 1206171003

Matrix: Soil/Solid (dry weight)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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	1.00U	2.00	0.620	ug/kg
1,1,2-Trichloroethane	0.400U	0.800	0.250	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	1.00U	2.00	0.620	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	0.500U	1.00	0.400	ug/kg
1,2-Dichlorobenzene	12.5U	25.0	7.80	ug/kg
1,2-Dichloroethane	1.00U	2.00	0.700	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	1.00U	2.00	0.620	ug/kg
Bromoform	12.5U	25.0	7.80	ug/kg
Bromomethane	10.0U	20.0	6.20	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

Print Date: 11/30/2020 3:14:28PM

Method Blank

Blank ID: MB for HBN 1814217 [VXX/36677]

Blank Lab ID: 1593088

QC for Samples:

1206171002, 1206171003

Matrix: Soil/Solid (dry weight)

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Chloroform	2.00U	4.00	1.00	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	2.50U	5.00	1.50	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	2.50U	5.00	1.50	ug/kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/kg
Vinyl acetate	50.0U	100	31.0	ug/kg
Vinyl chloride	0.400U	0.800	0.250	ug/kg
Xylenes (total)	37.5U	75.0	22.8	ug/kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	102	71-136		%
4-Bromofluorobenzene (surr)	98.3	55-151		%
Toluene-d8 (surr)	99.4	85-116		%

Print Date: 11/30/2020 3:14:28PM



Method Blank

Blank ID: MB for HBN 1814217 [VXX/36677]
Blank Lab ID: 1593088

Matrix: Soil/Solid (dry weight)

QC for Samples:
1206171002, 1206171003

Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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Batch Information

Analytical Batch: VMS20487
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: NRB
Analytical Date/Time: 11/14/2020 9:54:00PM

Prep Batch: VXX36677
Prep Method: SW5035A
Prep Date/Time: 11/14/2020 12:30:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 11/30/2020 3:14:28PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [VXX36677]

Blank Spike Lab ID: 1593089

Date Analyzed: 11/14/2020 22:37

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by SW8260D

Parameter	Blank Spike (ug/kg)			CL
	Spike	Result	Rec (%)	
1,1,1,2-Tetrachloroethane	750	779	104	(78-125)
1,1,1-Trichloroethane	750	780	104	(73-130)
1,1,2,2-Tetrachloroethane	750	739	99	(70-124)
1,1,2-Trichloroethane	750	749	100	(78-121)
1,1-Dichloroethane	750	749	100	(76-125)
1,1-Dichloroethene	750	784	104	(70-131)
1,1-Dichloropropene	750	782	104	(76-125)
1,2,3-Trichlorobenzene	750	660	88	(66-130)
1,2,3-Trichloropropane	750	717	96	(73-125)
1,2,4-Trichlorobenzene	750	711	95	(67-129)
1,2,4-Trimethylbenzene	750	748	100	(75-123)
1,2-Dibromo-3-chloropropane	750	758	101	(61-132)
1,2-Dibromoethane	750	767	102	(78-122)
1,2-Dichlorobenzene	750	737	98	(78-121)
1,2-Dichloroethane	750	754	101	(73-128)
1,2-Dichloropropane	750	770	103	(76-123)
1,3,5-Trimethylbenzene	750	760	101	(73-124)
1,3-Dichlorobenzene	750	759	101	(77-121)
1,3-Dichloropropane	750	766	102	(77-121)
1,4-Dichlorobenzene	750	755	101	(75-120)
2,2-Dichloropropane	750	818	109	(67-133)
2-Butanone (MEK)	2250	2330	103	(51-148)
2-Chlorotoluene	750	777	104	(75-122)
2-Hexanone	2250	2290	102	(53-145)
4-Chlorotoluene	750	750	100	(72-124)
4-Isopropyltoluene	750	760	101	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2300	102	(65-135)
Acetone	2250	2010	89	(36-164)
Benzene	750	759	101	(77-121)
Bromobenzene	750	799	106	(78-121)
Bromochloromethane	750	744	99	(78-125)
Bromodichloromethane	750	797	106	(75-127)
Bromoform	750	826	110	(67-132)
Bromomethane	750	835	111	(53-143)

Print Date: 11/30/2020 3:14:30PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [VXX36677]

Blank Spike Lab ID: 1593089

Date Analyzed: 11/14/2020 22:37

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by SW8260D

Parameter	Blank Spike (ug/kg)			CL
	Spike	Result	Rec (%)	
Carbon disulfide	1130	1260	112	(63-132)
Carbon tetrachloride	750	807	108	(70-135)
Chlorobenzene	750	754	101	(79-120)
Chloroethane	750	963	128	(59-139)
Chloroform	750	725	97	(78-123)
Chloromethane	750	733	98	(50-136)
cis-1,2-Dichloroethene	750	755	101	(77-123)
cis-1,3-Dichloropropene	750	821	109	(74-126)
Dibromochloromethane	750	827	110	(74-126)
Dibromomethane	750	772	103	(78-125)
Dichlorodifluoromethane	750	736	98	(29-149)
Ethylbenzene	750	754	100	(76-122)
Freon-113	1130	1170	104	(66-136)
Hexachlorobutadiene	750	875	117	(61-135)
Isopropylbenzene (Cumene)	750	742	99	(68-134)
Methylene chloride	750	752	100	(70-128)
Methyl-t-butyl ether	1130	1100	98	(73-125)
Naphthalene	750	694	93	(62-129)
n-Butylbenzene	750	761	101	(70-128)
n-Propylbenzene	750	750	100	(73-125)
o-Xylene	750	747	100	(77-123)
P & M -Xylene	1500	1490	100	(77-124)
sec-Butylbenzene	750	743	99	(73-126)
Styrene	750	767	102	(76-124)
tert-Butylbenzene	750	718	96	(73-125)
Tetrachloroethene	750	788	105	(73-128)
Toluene	750	736	98	(77-121)
trans-1,2-Dichloroethene	750	825	110	(74-125)
trans-1,3-Dichloropropene	750	817	109	(71-130)
Trichloroethene	750	766	102	(77-123)
Trichlorofluoromethane	750	816	109	(62-140)
Vinyl acetate	750	805	107	(50-151)
Vinyl chloride	750	773	103	(56-135)
Xylenes (total)	2250	2240	100	(78-124)

Print Date: 11/30/2020 3:14:30PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [VXX36677]
 Blank Spike Lab ID: 1593089
 Date Analyzed: 11/14/2020 22:37

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by SW8260D

Parameter	Blank Spike (ug/kg)			CL
	Spike	Result	Rec (%)	
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	97.6	98	(71-136)
4-Bromofluorobenzene (surr)	750	96.4	96	(55-151)
Toluene-d8 (surr)	750	100	100	(85-116)

Batch Information

Analytical Batch: **VMS20487**
 Analytical Method: **SW8260D**
 Instrument: **VRA Agilent GC/MS 7890B/5977A**
 Analyst: **NRB**

Prep Batch: **VXX36677**
 Prep Method: **SW5035A**
 Prep Date/Time: **11/14/2020 00:30**
 Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/30/2020 3:14:30PM

Matrix Spike Summary

Original Sample ID: 1593090
 MS Sample ID: 1593091 MS
 MSD Sample ID: 1593092 MSD

Analysis Date: 11/15/2020 1:19
 Analysis Date: 11/14/2020 23:00
 Analysis Date: 11/14/2020 23:15
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1206171002, 1206171003

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,1,1,2-Tetrachloroethane	6.10U	458	597	130 *	458	594	130 *	78-125	0.47	(< 20)
1,1,1-Trichloroethane	7.65U	458	589	128	458	589	129	73-130	0.12	(< 20)
1,1,2,2-Tetrachloroethane	0.610U	458	562	123	458	566	123	70-124	0.77	(< 20)
1,1,2-Trichloroethane	0.245U	458	579	126 *	458	580	126 *	78-121	0.16	(< 20)
1,1-Dichloroethane	7.65U	458	571	125	458	570	124	76-125	0.15	(< 20)
1,1-Dichloroethene	7.65U	458	568	124	458	554	121	70-131	2.40	(< 20)
1,1-Dichloropropene	7.65U	458	586	128 *	458	583	127 *	76-125	0.60	(< 20)
1,2,3-Trichlorobenzene	15.3U	458	518	113	458	649	142 *	66-130	22.40 *	(< 20)
1,2,3-Trichloropropane	0.610U	458	540	118	458	555	121	73-125	2.80	(< 20)
1,2,4-Trichlorobenzene	7.65U	458	537	117	458	621	135 *	67-129	14.50	(< 20)
1,2,4-Trimethylbenzene	15.3U	458	563	123	458	575	125 *	75-123	2.10	(< 20)
1,2-Dibromo-3-chloropropane	30.6U	458	591	129	458	627	137 *	61-132	5.90	(< 20)
1,2-Dibromoethane	0.306U	458	590	129 *	458	590	129 *	78-122	0.02	(< 20)
1,2-Dichlorobenzene	7.65U	458	547	119	458	540	118	78-121	1.10	(< 20)
1,2-Dichloroethane	0.610U	458	573	125	458	577	126	73-128	0.66	(< 20)
1,2-Dichloropropane	3.06U	458	587	128 *	458	593	129 *	76-123	1.00	(< 20)
1,3,5-Trimethylbenzene	7.65U	458	550	120	458	569	124	73-124	3.40	(< 20)
1,3-Dichlorobenzene	7.65U	458	558	122 *	458	572	125 *	77-121	2.30	(< 20)
1,3-Dichloropropane	3.06U	458	595	130 *	458	588	128 *	77-121	1.20	(< 20)
1,4-Dichlorobenzene	7.65U	458	552	121 *	458	570	124 *	75-120	3.20	(< 20)
2,2-Dichloropropane	7.65U	458	586	128	458	586	128	67-133	0.07	(< 20)
2-Butanone (MEK)	76.5U	1370	1820	133	1370	1890	137	51-148	3.40	(< 20)
2-Chlorotoluene	7.65U	458	566	124 *	458	575	126 *	75-122	1.60	(< 20)
2-Hexanone	30.6U	1370	1810	132	1370	1830	133	53-145	1.30	(< 20)
4-Chlorotoluene	7.65U	458	549	120	458	562	123	72-124	2.40	(< 20)
4-Isopropyltoluene	30.6U	458	553	121	458	579	126	73-127	4.70	(< 20)
4-Methyl-2-pentanone (MIBK)	76.5U	1370	1770	129	1370	1810	131	65-135	2.00	(< 20)
Acetone	76.5U	1370	1570	114	1370	1630	119	36-164	3.80	(< 20)
Benzene	3.83U	458	578	126 *	458	578	126 *	77-121	0.01	(< 20)
Bromobenzene	7.65U	458	588	128 *	458	582	127 *	78-121	1.00	(< 20)
Bromochloromethane	7.65U	458	566	123	458	570	124	78-125	0.77	(< 20)
Bromodichloromethane	0.610U	458	611	133 *	458	616	135 *	75-127	0.81	(< 20)
Bromoform	7.65U	458	636	139 *	458	642	140 *	67-132	0.94	(< 20)
Bromomethane	6.10U	458	693	151 *	458	663	145 *	53-143	4.40	(< 20)
Carbon disulfide	30.6U	687	859	125	687	821	119	63-132	4.60	(< 20)
Carbon tetrachloride	3.83U	458	612	134	458	604	132	70-135	1.40	(< 20)
Chlorobenzene	7.65U	458	575	126 *	458	575	125 *	79-120	0.14	(< 20)

Print Date: 11/30/2020 3:14:32PM

Matrix Spike Summary

Original Sample ID: 1593090
 MS Sample ID: 1593091 MS
 MSD Sample ID: 1593092 MSD

Analysis Date: 11/15/2020 1:19
 Analysis Date: 11/14/2020 23:00
 Analysis Date: 11/14/2020 23:15
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1206171002, 1206171003

Results by SW8260D

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Chloroethane	61.0U	458	676	148 *	458	655	143 *	59-139	3.30	(< 20)
Chloroform	1.23U	458	553	121	458	555	121	78-123	0.43	(< 20)
Chloromethane	7.65U	458	627	137 *	458	593	129	50-136	5.60	(< 20)
cis-1,2-Dichloroethene	7.65U	458	571	125 *	458	576	126 *	77-123	0.89	(< 20)
cis-1,3-Dichloropropene	3.83U	458	621	136 *	458	621	135 *	74-126	0.11	(< 20)
Dibromochloromethane	1.53U	458	643	140 *	458	640	140 *	74-126	0.53	(< 20)
Dibromomethane	7.65U	458	588	128 *	458	592	129 *	78-125	0.65	(< 20)
Dichlorodifluoromethane	15.3U	458	657	143	458	596	130	29-149	9.80	(< 20)
Ethylbenzene	7.65U	458	567	124 *	458	573	125 *	76-122	0.96	(< 20)
Freon-113	30.6U	687	823	120	687	815	119	66-136	1.00	(< 20)
Hexachlorobutadiene	6.10U	458	634	138 *	458	612	134	61-135	3.50	(< 20)
Isopropylbenzene (Cumene)	7.65U	458	551	120	458	574	125	68-134	4.10	(< 20)
Methylene chloride	30.6U	458	567	124	458	568	124	70-128	0.17	(< 20)
Methyl-t-butyl ether	30.6U	687	830	121	687	846	123	73-125	1.90	(< 20)
Naphthalene	7.65U	458	539	118	458	625	136 *	62-129	14.60	(< 20)
n-Butylbenzene	7.65U	458	538	117	458	548	120	70-128	2.00	(< 20)
n-Propylbenzene	7.65U	458	541	118	458	572	125	73-125	5.50	(< 20)
o-Xylene	7.65U	458	572	125 *	458	581	127 *	77-123	1.60	(< 20)
P & M -Xylene	15.3U	917	1110	121	917	1140	125 *	77-124	2.80	(< 20)
sec-Butylbenzene	7.65U	458	530	116	458	568	124	73-126	7.10	(< 20)
Styrene	7.65U	458	592	129 *	458	596	130 *	76-124	0.60	(< 20)
tert-Butylbenzene	7.65U	458	529	115	458	550	120	73-125	3.90	(< 20)
Tetrachloroethene	3.83U	458	578	126	458	592	129 *	73-128	2.40	(< 20)
Toluene	7.65U	458	564	123 *	458	562	123 *	77-121	0.21	(< 20)
trans-1,2-Dichloroethene	7.65U	458	571	125	458	567	124	74-125	0.84	(< 20)
trans-1,3-Dichloropropene	3.83U	458	618	135 *	458	611	133 *	71-130	1.10	(< 20)
Trichloroethene	1.53U	458	577	126 *	458	581	127 *	77-123	0.70	(< 20)
Trichlorofluoromethane	15.3U	458	673	147 *	458	660	144 *	62-140	1.90	(< 20)
Vinyl acetate	30.6U	458	674	147	458	686	150	50-151	1.90	(< 20)
Vinyl chloride	0.245U	458	644	141 *	458	682	149 *	56-135	5.60	(< 20)
Xylenes (total)	22.9U	1370	1680	122	1370	1720	125 *	78-124	2.40	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		458	449	98	458	452	99	71-136	0.66	
4-Bromofluorobenzene (surr)		603	538	89	603	541	90	55-151	0.55	
Toluene-d8 (surr)		458	463	101	458	458	100	85-116	1.10	

Print Date: 11/30/2020 3:14:32PM

Matrix Spike Summary

Original Sample ID: 1593090
 MS Sample ID: 1593091 MS
 MSD Sample ID: 1593092 MSD

Analysis Date:
 Analysis Date: 11/14/2020 23:00
 Analysis Date: 11/14/2020 23:15
 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1206171002, 1206171003

Results by SW8260D

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

Batch Information

Analytical Batch: VMS20487
 Analytical Method: SW8260D
 Instrument: VRA Agilent GC/MS 7890B/5977A
 Analyst: NRB
 Analytical Date/Time: 11/14/2020 11:00:00PM

Prep Batch: VXX36677
 Prep Method: Vol. Extraction SW8260 Field Extracted L
 Prep Date/Time: 11/14/2020 12:30:00AM
 Prep Initial Wt./Vol.: 103.64g
 Prep Extract Vol: 31.71mL

Print Date: 11/30/2020 3:14:32PM

Method Blank

Blank ID: MB for HBN 1814130 [XXX/44219]
 Blank Lab ID: 1592647

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1206171002, 1206171003

Results by 8270D SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
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)	78.3	58-103		%
Fluoranthene-d10 (surr)	84.7	54-113		%

Batch Information

Analytical Batch: XMS12421
 Analytical Method: 8270D SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 11/25/2020 4:55:00PM

Prep Batch: XXX44219
 Prep Method: SW3550C
 Prep Date/Time: 11/11/2020 2:20:07PM
 Prep Initial Wt./Vol.: 22.5 g
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [XXX44219]

Blank Spike Lab ID: 1592648

Date Analyzed: 11/25/2020 17:16

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by 8270D SIM (PAH)

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	93.0	84	(43-111)
2-Methylnaphthalene	111	94.4	85	(39-114)
Acenaphthene	111	96.8	87	(44-111)
Acenaphthylene	111	98.3	89	(39-116)
Anthracene	111	97.1	87	(50-114)
Benzo(a)Anthracene	111	92.4	83	(54-122)
Benzo[a]pyrene	111	95.9	86	(50-125)
Benzo[b]Fluoranthene	111	99.2	89	(53-128)
Benzo[g,h,i]perylene	111	93.0	84	(49-127)
Benzo[k]fluoranthene	111	101	91	(56-123)
Chrysene	111	101	91	(57-118)
Dibenzo[a,h]anthracene	111	93.9	85	(50-129)
Fluoranthene	111	104	93	(55-119)
Fluorene	111	98.9	89	(47-114)
Indeno[1,2,3-c,d] pyrene	111	101	91	(49-130)
Naphthalene	111	93.8	84	(38-111)
Phenanthrene	111	105	94	(49-113)
Pyrene	111	102	92	(55-117)

Surrogates

2-Methylnaphthalene-d10 (surr)	111	82.4	82	(58-103)
Fluoranthene-d10 (surr)	111	84.8	85	(54-113)

Batch Information

Analytical Batch: XMS12421

Analytical Method: 8270D SIM (PAH)

Instrument: Agilent GC 7890B/5977A SWA

Analyst: LAW

Prep Batch: XXX44219

Prep Method: SW3550C

Prep Date/Time: 11/11/2020 14:20

Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL

Dupe Init Wt./Vol.: Extract Vol:



Matrix Spike Summary

Original Sample ID: 1206170020
 MS Sample ID: 1592649 MS
 MSD Sample ID: 1592650 MSD

Analysis Date: 11/25/2020 22:03
 Analysis Date: 11/25/2020 22:24
 Analysis Date: 11/25/2020 22:44
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171002, 1206171003

Results by 8270D SIM (PAH)

Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	16.1U	145	118	82	145	113	78	43-111	3.80	(< 20)
2-Methylnaphthalene	16.1U	145	120	83	145	115	80	39-114	3.90	(< 20)
Acenaphthene	16.1U	145	120	83	145	117	81	44-111	2.80	(< 20)
Acenaphthylene	16.1U	145	123	86	145	119	83	39-116	3.20	(< 20)
Anthracene	16.1U	145	118	82	145	117	81	50-114	1.70	(< 20)
Benzo(a)Anthracene	16.1U	145	113	79	145	112	78	54-122	1.20	(< 20)
Benzo(a)pyrene	16.1U	145	119	83	145	118	82	50-125	1.10	(< 20)
Benzo(b)Fluoranthene	16.1U	145	123	85	145	121	84	53-128	1.10	(< 20)
Benzo(g,h,i)perylene	16.1U	145	113	79	145	113	78	49-127	0.66	(< 20)
Benzo(k)fluoranthene	16.1U	145	121	84	145	119	83	56-123	1.20	(< 20)
Chrysene	16.1U	145	121	84	145	119	82	57-118	2.10	(< 20)
Dibenzo(a,h)anthracene	16.1U	145	116	80	145	115	79	50-129	0.94	(< 20)
Fluoranthene	16.1U	145	125	87	145	123	85	55-119	1.50	(< 20)
Fluorene	16.1U	145	121	84	145	118	81	47-114	2.80	(< 20)
Indeno[1,2,3-c,d] pyrene	16.1U	145	122	85	145	121	84	49-130	0.42	(< 20)
Naphthalene	12.9U	145	118	82	145	115	80	38-111	3.20	(< 20)
Phenanthrene	16.1U	145	127	89	145	124	86	49-113	2.70	(< 20)
Pyrene	16.1U	145	121	84	145	121	84	55-117	0.26	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		145	113	79	145	112	78	58-103	0.62	
Fluoranthene-d10 (surr)		145	114	79	145	112	78	54-113	1.40	

Batch Information

Analytical Batch: XMS12421
 Analytical Method: 8270D SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 11/25/2020 10:24:00PM

Prep Batch: XXX44219
 Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
 Prep Date/Time: 11/11/2020 2:20:07PM
 Prep Initial Wt./Vol.: 22.60g
 Prep Extract Vol: 5.00mL

Print Date: 11/30/2020 3:14:37PM

Method Blank

Blank ID: MB for HBN 1814151 [XXX/44222]

Blank Lab ID: 1592765

QC for Samples:

1206171001, 1206171002, 1206171003

Matrix: Soil/Solid (dry weight)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	96.8	60-120		%

Batch Information

Analytical Batch: XFC15811

Analytical Method: AK102

Instrument: Agilent 7890B F

Analyst: CDM

Analytical Date/Time: 11/13/2020 8:52:00PM

Prep Batch: XXX44222

Prep Method: SW3550C

Prep Date/Time: 11/12/2020 10:59:40AM

Prep Initial Wt./Vol.: 30 g

Prep Extract Vol: 5 mL

Print Date: 11/30/2020 3:14:39PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [XXX44222]
 Blank Spike Lab ID: 1592766
 Date Analyzed: 11/13/2020 21:02

Spike Duplicate ID: LCSD for HBN 1206171 [XXX44222]
 Spike Duplicate Lab ID: 1592767
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171001, 1206171002, 1206171003

Results by AK102

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	833	727	87	833	711	85	(75-125)	2.20	(< 20)

Surrogates

5a Androstane (surr)	16.7	107	107	16.7	107	107	(60-120)	0.26	
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Batch Information

Analytical Batch: **XFC15811**
 Analytical Method: **AK102**
 Instrument: **Agilent 7890B F**
 Analyst: **CDM**

Prep Batch: **XXX44222**
 Prep Method: **SW3550C**
 Prep Date/Time: **11/12/2020 10:59**
 Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

Print Date: 11/30/2020 3:14:41PM

Method Blank

Blank ID: MB for HBN 1814151 [XXX/44222]

Blank Lab ID: 1592765

QC for Samples:

1206171001, 1206171002, 1206171003

Matrix: Soil/Solid (dry weight)

Results by AK103

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Residual Range Organics	50.0U	100	43.0	mg/kg
Surrogates				
n-Triacontane-d62 (surr)	102	60-120		%

Batch Information

Analytical Batch: XFC15811

Analytical Method: AK103

Instrument: Agilent 7890B F

Analyst: CDM

Analytical Date/Time: 11/13/2020 8:52:00PM

Prep Batch: XXX44222

Prep Method: SW3550C

Prep Date/Time: 11/12/2020 10:59:40AM

Prep Initial Wt./Vol.: 30 g

Prep Extract Vol: 5 mL

Print Date: 11/30/2020 3:14:44PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [XXX44222]
 Blank Spike Lab ID: 1592766
 Date Analyzed: 11/13/2020 21:02

Spike Duplicate ID: LCSD for HBN 1206171 [XXX44222]
 Spike Duplicate Lab ID: 1592767
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171001, 1206171002, 1206171003

Results by AK103

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Residual Range Organics	833	738	89	833	718	86	(60-120)	2.80	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7	101	101	16.7	102	102	(60-120)	0.94	

Batch Information

Analytical Batch: **XFC15811**
 Analytical Method: **AK103**
 Instrument: **Agilent 7890B F**
 Analyst: **CDM**

Prep Batch: **XXX44222**
 Prep Method: **SW3550C**
 Prep Date/Time: **11/12/2020 10:59**
 Spike Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 833 mg/kg Extract Vol: 5 mL

Print Date: 11/30/2020 3:14:47PM

Method Blank

Blank ID: MB for HBN 1814198 [XXX/44231]
 Blank Lab ID: 1592958

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1206171001, 1206171002, 1206171003

Results by SW8082A

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Aroclor-1016	25.0U	50.0	12.5	ug/kg
Aroclor-1221	50.0U	100	25.0	ug/kg
Aroclor-1232	25.0U	50.0	12.5	ug/kg
Aroclor-1242	25.0U	50.0	12.5	ug/kg
Aroclor-1248	25.0U	50.0	12.5	ug/kg
Aroclor-1254	25.0U	50.0	12.5	ug/kg
Aroclor-1260	25.0U	50.0	12.5	ug/kg

Surrogates

Decachlorobiphenyl (surr)	97	60-125		%
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Batch Information

Analytical Batch: XGC10762
 Analytical Method: SW8082A
 Instrument: Agilent 7890B GC ECD SW F
 Analyst: LAW
 Analytical Date/Time: 11/16/2020 10:00:00AM

Prep Batch: XXX44231
 Prep Method: SW3550C
 Prep Date/Time: 11/13/2020 1:20:59PM
 Prep Initial Wt./Vol.: 22.5 g
 Prep Extract Vol: 5 mL

Print Date: 11/30/2020 3:14:49PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1206171 [XXX44231]
 Blank Spike Lab ID: 1592959
 Date Analyzed: 11/16/2020 10:10

Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171001, 1206171002, 1206171003

Results by SW8082A

Parameter	Blank Spike (ug/kg)			CL
	Spike	Result	Rec (%)	
Aroclor-1016	222	216	97	(47-134)
Aroclor-1260	222	240	108	(53-140)
Surrogates				
Decachlorobiphenyl (surr)	222	92	92	(60-125)

Batch Information

Analytical Batch: **XGC10762**
 Analytical Method: **SW8082A**
 Instrument: **Agilent 7890B GC ECD SW F**
 Analyst: **LAW**

Prep Batch: **XXX44231**
 Prep Method: **SW3550C**
 Prep Date/Time: **11/13/2020 13:20**
 Spike Init Wt./Vol.: 222 ug/kg Extract Vol: 5 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1206145001
 MS Sample ID: 1592960 MS
 MSD Sample ID: 1592961 MSD

Analysis Date: 11/16/2020 16:43
 Analysis Date: 11/16/2020 16:54
 Analysis Date: 11/16/2020 17:04
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1206171001, 1206171002, 1206171003

Results by SW8082A

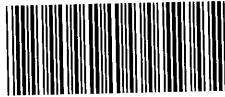
Parameter	Sample	Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Aroclor-1016	1875U	329	1875U	0 *	327	1875U	0 *	47-134	0.00	(< 30)
Aroclor-1260	40700	329	38438	-661 *	327	37387	-993 *	53-140	2.86	(< 30)
Surrogates										
Decachlorobiphenyl (surr)		329	329	100	327	327	100	60-125	0.26	

Batch Information

Analytical Batch: XGC10763
 Analytical Method: SW8082A
 Instrument: Agilent 7890B GC ECD SW R
 Analyst: LAW
 Analytical Date/Time: 11/16/2020 4:54:00PM

Prep Batch: XXX44231
 Prep Method: Sonication Extraction Soil SW8082 PCB
 Prep Date/Time: 11/13/2020 1:20:59PM
 Prep Initial Wt./Vol.: 22.83g
 Prep Extract Vol: 5.00mL

1206171



365300 X0

Shannon & Wilson, Inc.
5430 Fairbanks Street, Suite 3
Anchorage, Alaska 99518
(907) 561-2120
Fax (206) 695-6777

SGS North America Inc.

DRO/RRO- AK102/103	PCBs- EPA Method 8082A	GRO- AK101	VOCs- EPA Method 80260D	RCRA Metals	PAHs- EPA Method 8270D SIM
4C AR HCF	4C	MeOH	MeOH	4C	4C
X	X				
X	X	X	X	X	X
X	X	X	X	X	X

Date	Time	Sample ID	Total Containers
11/5/2020	10:15	101644-TP1S2	2
11/5/2020	10:25	101644-TP1S5	3
11/5/2020	10:40	101644-TP1S15	3

LAB
 CAC
 CAC
 5/11/20

Relinquished By:		Relinquished By:		Project Information	
Signature: <i>Alex Poro</i>		Signature: _____		Project Number: 101644	
Print Name: Alex Poro		Print Name: _____		Project Name: Port Heiden Frosty Fuels	
Company: Shannon & Wilson, Inc.		Company: _____		Contact: Dan McMahon	
Date: 11/9/20		Date: _____		Sampler: AJR	
Time: _____		Time: _____		Special Instructions:	
Received By:		Received By:		Sample Receipt	
Signature: _____		Signature: <i>ML</i>		Shipped Via: <u>Hand Delivered</u> Absent	
Print Name: _____		Print Name: ML		Cooler Temperature Upon Arrival: 1.0°C 059	
Company: _____		Company: SGS		Sample Matrix: Groundwater Soil	
Date: _____		Date: 11/9/20		10 Working DAY TAT	
Time: _____		Time: 13 11			



e-Sample Receipt Form

SGS Workorder #:

1206171



1 2 0 6 1 7 1

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	N/A	ABSENT
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
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 @ 1.0 °C Therm. ID: D59
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		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	
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.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals))	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?	N/A	
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

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1206171001-A	No Preservative Required	OK			
1206171001-B	No Preservative Required	OK			
1206171002-A	No Preservative Required	OK			
1206171002-B	No Preservative Required	OK			
1206171002-C	Methanol field pres. 4 C	OK			
1206171003-A	No Preservative Required	OK			
1206171003-B	No Preservative Required	OK			
1206171003-C	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.

NC- The container provided was not preserved or was under-preserved. The method does not allow for additional preservative added after collection.

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.

QN - Insufficient sample quantity provided.

LABORATORY DATA REVIEW CHECKLIST

Completed by: Alec Rizzo

Title: Geologist

Date: 12/16/2020

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.

Laboratory Report Number: 1206171

Laboratory Report Date: 11/30/2020

Contaminated Site Name: Frosty Fuels, Inc.- Port Heiden

ADEC File Number: 2637.26.002 and 637.57.002

Hazard Identification Number: 23200

(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

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

Comments:

- b. Correct analyses requested? **Yes** / No / NA

Comments:

3. Laboratory Sample Receipt Documentation

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

Yes / No / NA

Comments: *The cooler temperature blank was 1.0° Celsius.*

- b. Sample preservation acceptable - acidified waters, Methanol preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes**/ No / NA

Comments:

- c. Sample condition documented - broken, leaking (MeOH), zero headspace (VOC vials)? **Yes**/ No / NA

Comments:

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.? Yes / No / **NA**

Comments: *No discrepancies were noted.*

- e. Data quality or usability affected?

Comments: *Data quality/usability considered unaffected; see above.*

4. Case Narrative

- a. Present and understandable? **Yes**/ No / NA

Comments:

- b. Discrepancies, errors or QC failures noted by the lab? **Yes** / No / NA

Comments: *The case narrative noted the following:*

- *MS – 6020B - Metals recovery for barium does not meet QC criteria. The post digestion spike was successful.*
- *MS/MSD – 8082A - PCB Aroclors 1016/1260 recoveries do not meet QC criteria due to sample matrix. Refer to the LCS for accuracy requirements.*
- *MS/MSD – 8260D - Recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements*
- *MS/MSD - 8260D – RPD for 1,2,3-trichlorobenzene does not meet QC criteria. This analyte was not detected above the LOQ in the parent sample.*

- c. Were all corrective actions documented? **Yes**/ No / NA

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

Comments:

- b. All applicable holding times met? **Yes**/ No / NA

Comments:

- c. All soils reported on a dry weight basis? **Yes** / No / NA

Comments:

- d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes** / No / NA

Comments: *The LOQs for 1,2,3-trichloropropane, 1,2-dibromoethane, dibromochloromethane, dibromomethane, hexachlorobutadiene, and vinyl chloride exceed the ADEC cleanup levels.*

- e. Data quality or usability affected?

Comments: *There is a potential that the target analytes are present at concentrations greater than the ADEC cleanup level, but less than the LOQ; however, the analytes were not detected at estimated concentrations in the project samples.*

6. QC Samples

a. Method Blank

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

Yes / No / NA

Comments:

- ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes / No / NA

Comments: *Although, GRO (0.782 J mg/kg) was detected in the method blank at a concentration less than the LOQ.*

- iii. If above LOQ or project specified objectives, what samples are affected?

Comments: *Samples TP1S5 and TP1S15.*

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

Yes **No** / NA

Comments: *When the reported concentrations are within 10 times the reported blank concentration, the project samples are flagged "B." GRO was detected at estimated concentrations in Samples TP1S5 and TP1S15 at levels less than the LOQ; therefore, the sample concentrations are reported as non-detect at the LOQ and flagged "B" in Table 2.*

- v. Data quality or usability affected?

Comments: *See above.*

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples?
(LCS/LCSD required per AK methods, LCS required per SW846) **Yes** / No / NA
Comments:
- ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes** / No / NA
Comments:
- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable. (AK petroleum methods: AK 101 60%-120%, AK 102 75%-125%, AK 103 60%-120%; all other analyses see the laboratory QC pages) **Yes** / No / NA
Comments:
- iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits and project specified objectives, if applicable. RPD reported from LCS/LCSD, and/or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA
Comments:
- v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments:
- vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?
Yes / No / **NA**
Comments:
- vii. Data quality or usability affected?
Comments: *No, see above.*

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

Note: Leave blank if not required for project

- i. Organics - One MS/MSD reported per matrix, analysis, and 20 samples?
Yes / No / NA
Comments:
- ii. Metals/Inorganics - One MS and one MSD reported per matrix, analysis and 20 samples? **Yes** / No / NA
Comments:

- iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable. (AK petroleum methods: AK 101 60%-120%, AK 102 75%-125%, AK 103 60%-120%; all other analyses see the laboratory QC pages) **Yes** **No** / NA

Comments: *The MS/MSD recoveries for several VOC analytes do not meet QC criteria. In addition, the MS/MSD recoveries for PCB Aroclors 1016/1260 do not meet QC criteria.*

- iv. Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits and project specified objectives, if applicable. RPD reported from MS/MSD, and/or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** **No** / NA

Comments: *The MS/MSD RPD for 1,2,3-trichlorobenzene does not meet QC criteria.*

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

Comments: *Samples TP1S5 and TP1S15.*

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

Yes **No** / NA

Comments: *No, the samples used as the parent were collected from another work order. Therefore, flagging is not required.*

- vii. Data quality or usability affected?

Comments: *No, see above.*

d. Surrogates - Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

- i. Are surrogate/IDA recoveries reported for organic analyses - field, QC, and laboratory samples? **Yes** / No / NA

Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) **Yes** / No / NA

Comments:

- iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined? **Yes** / No / **NA**

Comments:

- iv. Data quality or usability affected?

Comments: *No, see above.*

e. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.)

- i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? **Yes / No / NA**

Comments: *Our ADEC-approved work plan did not include volatile analyses. Therefore, a trip blank was not included with the sample kit. Based on changed site conditions volatiles were analyzed.*

- ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA**

Comments:

- iii. All results less than LOQ and project specified objectives? **Yes / No / NA**

Comments:

- iv. If above LOQ or project specified DQOs, what samples are affected?

Comments:

- v. Data quality or usability affected?

Comments:

f. Field Duplicate

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

Yes / No / NA

Comments: *Sample TP1S15 (duplicate of TP1S5) was submitted to the laboratory.*

- ii. Were the field duplicates submitted blind to the lab? **Yes / No / NA**

Comments:

- iii. Precision – All relative percent differences (RPDs) less than specified project objectives? (Recommended: 30% for water, 50% for soil) **Yes / No / NA**

Comments:

- iv. Data quality or usability affected?

Comments: *No, see above.*

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

Yes / No / NA

Comments: *A decontamination blank was not included in our ADEC-approved workplan.*

- i. All results less than LOQ and project specified objectives?

Yes / No / NA

Comments:

Laboratory Report Number: 1206171

ii. If above LOQ or project specified objectives, what samples are affected?
Comments:

iii. Data quality or usability affected?
Comments:

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

a. Defined and appropriate? **Yes** / No / NA
Comments: *A key is provided on Page 4 of the SGS Laboratory Report.*

ATTACHMENT 4

IMPORTANT INFORMATION ABOUT YOUR
GEOTECHNICAL/ENVIRONMENTAL REPORT



Date: February 2021
To: ADOT

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