SHANNON & WILSON
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

February 14, 2022

Ms. Connie Walker
Holy Cross Oil Company
PO Box 228
Holy Cross, Alaska 99602

RE: ADDITIONAL SITE CHARACTERIZATION ACTIVITIES REPORT, HOLY CROSS OIL COMPANY SITE, HOLY CROSS, ALASKA; ADEC FILE NO. 2417.38.002

Dear Ms. Walker:

We are pleased to submit this report which presents the results of our site characterization activities at the Holy Cross Oil Company Site in Holy Cross, Alaska. A vicinity map and site plan are included as Figure 1 and 2, respectively.

SITE DESCRIPTION

The site characterization activities were conducted east of the former Holy Cross Oil Company bulk fuel storage tank farm. The former tank farm consisted of a bermed area with five aboveground storage tanks (ASTs) ranging in size from 12,500 gallons to 50,000 gallons. Several smaller ASTs, which do not appear to be in current use, are located outside of the former tank farm to the north and east. Two unpaved dirt access roads, labelled Primary Road and Secondary Road on Figure 2, are present east of the former tank farm. Ghost Bank Slough is located approximately 75 feet east of the former tank farm.

The area occupied by the former tank farm and the Primary Road is generally level. To the east, the ground surface drops approximately 7 feet in elevation to the Secondary Road. The ground continues sloping down to the Ghost Bank Slough. In August 2021, the water surface of Ghost Bank Slough was approximately 3 feet lower than the Secondary Road.

BACKGROUND

According to Spiltech, Inc.'s January 29, 1991 Spill Cleanup / Site Remediation Plan, approximately 20,000 gallons of gasoline were spilled at the Holy Cross Oil Company bulk fuel storage tank farm. Reportedly, a pipeline broke in January 1991 and fuel impacted snow and ice were observed in an area approximately 60 feet by 240 feet, east of the tank farm in a slough.

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On July 12, 2017, Shannon & Wilson advanced six hand borings (PB1 through PB6) at the site in the approximate locations shown on Figure 2. In general, Hand Borings PB1 and PB3 were advanced within the approximate location of the 1991 spill, with four additional hand borings (PB2 and PB4 through PB6) positioned radially outward to delineate the lateral extent of impacted soil. Soil samples collected from Hand Boring PB1 and PB2 contained benzene, toluene, ethylbenzene, xylenes, naphthalene, and gasoline range organics (GRO) at concentrations that exceed the most stringent ADEC Method Two migration to groundwater cleanup levels.

In a letter dated January 25, 2018, Ms. Erin Gleason of the ADEC requested that additional site characterization activities occur to determine the horizontal and vertical extent of the contamination. In addition, Ms. Gleason requested additional information regarding the reportedly buried fuel pipe connecting the meter house at the tank farm and the dispensing pumps, and the current condition of the fuel pipe, if present at the site.

FIELD ACTIVITIES

The project consisted of a fuel supply lines evaluation, advancing six test pits, installing one temporary monitoring well, and collecting field screening and analytical soil and groundwater samples. The test pit and temporary well locations are shown on Figure 2. Prior to advancing the test pits, local utilities, the Village of Holy Cross, and the Holy Cross Oil Company were contacted to mark buried utilities within the project area. The field activities were conducted in general accordance with our ADEC approved May 2021 *Work Plan for Additional Site Characterization Activities, Holy Cross Oil Company Site, Holy Cross, Alaska.* Ms. Erin Gleason, of the ADEC, approved the Work Plan in a letter dated May 26, 2021.

Shannon & Wilson provided Qualified Environmental Professionals to collect field screening readings and analytical soil and groundwater samples. The Holy Cross Tribal Corporation provided the equipment and personnel to advance the test pits and install the temporary monitoring well. SGS North America, Inc. (SGS) of Anchorage, Alaska conducted the analytical testing of the project samples.

Site photographs and copies of field notes are included in Attachments 1 and 2, respectively. Test pit logs are provided in Attachment 3. It should be noted that the field notes presented in Attachment 2 are provided for informational purposes only. Tables 1 through 3, and the test pit logs presented in Attachment 3 represent our interpretation of the field data and take precedence over the field notes.

TEST PITS

Six test pits, TP1 through TP6 (Photos 3 through 5), were advanced to depths between 13 and 16 feet below ground surface (bgs). Test Pits TP1 through TP4 were advanced to further delineate the extent of soil contamination previously identified in Hand Borings PB1 and PB2. Step-out Test Pits TP5 and TP6 were advanced based on elevated field screening readings and sensory evidence of contamination observed in Test Pits TP1 and TP2, respectively.

Soil at the site generally consisted of sand with silt in varying proportions. Debris, consisting of miscellaneous household items, wire, and automotive parts was observed in Test Pit TP3 at approximately 2 to 3 feet bgs.

Soil Sampling

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

Two analytical soil samples from each test pit were submitted for laboratory analysis. The samples were collected from the interval just above the soil/water interface and from the sample interval with the highest PID measurement. The samples were submitted for analysis of GRO by Alaska Method (AK) 101, diesel range organics (DRO) by AK 102, and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B. The two samples with the highest PID readings, Samples TP1-S6 and TP1-S7, were also submitted for analysis of VOCs by EPA Method 8260D, in lieu of BTEX, and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM. One duplicate sample was also collected. For quality control purposes, one trip blank accompanying the sample cooler with the volatile samples was submitted and was analyzed for GRO/VOCs by AK 101/EPA Method 8260D

Analytical samples were collected by quickly and completely filling laboratory-provided glass jars in decreasing order of volatility. For each volatile sample, at least 25 grams of soil, but no more than what can be completely submerged with 25-milliliters of methanol, were placed into a pre-weighed, 4-ounce jar with a septa lid. A 25-milliliter aliquot of methanol containing laboratory-added surrogates was added to the sample jar to submerge the soil sample. For each non-volatile sample, the laboratory-supplied jar was completely filled with soil, taking care to exclude gravel and debris. Sample jars were filled using dedicated stainless-steel spoons, placed in coolers with ice packs, and transferred to the laboratory using chain of custody procedures.

Temporary Monitoring Well Installation

Groundwater was encountered in each test pit at depths ranging from 9 to 14 feet bgs. In Test Pits TP1, TP2, and TP4 through TP6, groundwater was encountered near the end of the excavator's reach. As a result, monitoring wells could not be installed in these test pits. In Test Pit TP3, groundwater was encountered at approximately 9 feet bgs and Temporary Monitoring Well TW-TP3 was installed to approximately 14.8 feet bgs (Photo 6). During sampling, it was discovered that the well had been damaged during backfilling activities. Therefore, a test pit was advanced adjacent and downslope of Test Pit TP3 to install a replacement monitoring well. Due to the surface topography, the second test pit was approximately 7 feet lower in elevation than Test Pit TP3. Following installation of the well, groundwater was observed at 1.86 feet bgs. The surface of Ghost Bank Slough was noted to be approximately 3 feet lower than the ground surface at the location of Temporary Monitoring Well TW-TP3.

The temporary well casing consisted of 1-inch nominal inner diameter, schedule 80 polyvinyl chloride (PVC) pipe with threaded connections. The lower portion of the casing consisted of a 5-foot section of 0.010-inch, machine-slotted well screen. The test pit was backfilled around the well. The temporary well was left undisturbed for approximately 1 hour to allow groundwater to accumulate. Prior to sampling, depth-to-water, with respect to the ground surface, was measured with an electronic water level indicator. Grab groundwater samples were collected with a disposable polyethylene bailer. The well was not purged prior to sampling, therefore the sample collected is of screening level quality.

The analytical samples were collected by transferring water directly from the bailer into the laboratory supplied containers. The sample jars were filled in decreasing order of volatility. One analytical groundwater sample was submitted to SGS for analysis of GRO by AK 101, DRO by AK 102, PAHs by EPA Method 8270D SIM, and VOCs by EPA Method 8260D. One

duplicate sample was collected. For quality control purposes, one trip blank accompanying the sample cooler with the volatile samples was submitted and was analyzed for GRO/VOCs by AK 101/EPA Method 8260D

Following groundwater sampling, the temporary well was removed from the ground and the void space was backfilled with native material.

FUEL SUPPLY LINES EVALUATION

At the request of the ADEC, Shannon & Wilson visually assessed the former fuel supply lines. A tank farm consisting of five ASTs, located within a bermed area, was observed during our 2017 site characterization efforts, west of the project site. The tanks were removed prior to our 2021 site visit. Three ASTs are currently located north of the former tank farm and two AST are located west of the former tank farm. The ASTs are approximately 500 gallons or less and do not appear to be in use. Several sections of 2-inch and 4-inch steel aboveground piping were observed southwest of Test Pit TP1, north of Test Pit TP4, and east of Test Pit TP2 (Figure 2 and Photos 1 and 2). However, thick vegetation has overgrown the area and may have obscured other segments.

Holy Cross Oil Company was unable to locate as-built drawings regarding the tank farm, including locations and conditions of the fuel supply lines, aboveground storage tanks, meter house and the dispensing pumps. Similarly, operations records of training, inspections (e.g., leak and/or tightness testing) changes in configuration of systems, acceptance and delivery of fuel, and repairs or change-in-service at the tank farm were not available.

DISCUSSION OF ANALYTICAL RESULTS

The analytical results were compared to the ADEC cleanup levels presented in the June 2021, 18 AAC 75 regulations. The applicable soil criteria consist of the most stringent ADEC Method Two cleanup levels listed in Table B1 and B2 of 18 AAC 75.341, for the "under 40-inch (precipitation) zone". The groundwater criteria consist of the cleanup levels listed in Table C of 18 AAC 75.345.

The laboratory report and completed ADEC Laboratory Data Review Checklist (LDRC) are provided in Attachment 4. The analytical results for soil are summarized in Table 2. The analytical results for groundwater are summarized in Table 3.

Soil

Soil samples collected from Test Pits TP1, TP2, and TP4 contained concentrations of at least one target analyte exceeding ADEC Method Two soil cleanup levels. Concentrations of GRO, DRO, benzene, toluene, ethylbenzene, xylenes, 1,2,4-trimethylbenzene, 1,2-dibromoethane, 1,3,5-trimethylbenzene, chloroform, and/or naphthalene exceeding the ADEC Method Two cleanup levels were detected in at least one sample. With the exception of DRO, the highest contaminant concentrations were detected in the samples collected from Test Pit TP1. Sample TP1-S7, collected from Test Pit TP1, contained 33.4 mg/kg benzene and 172 mg/kg xylenes which exceeds the ADEC Method Two Human Health cleanup levels of 11 mg/kg and 57 mg/kg, respectively. Sample TP4-S5, collected from Test Pit TP4 contained 15,500 mg/kg DRO which exceeds the ADEC Maximum Allowable Concentration of 12,500 mg/kg. Soil samples collected from Test Pits TP3, TP5, and TP6 did not contain target analytes exceeding the ADEC Method Two cleanup levels.

The horizontal extent of soil contamination is bounded to the north and south by Test Pits TP5 and TP6, respectively. Petroleum-impacted soil observed in Test Pit TP2 is bounded to the east by Test Pit TP3. Hand Borings PB3 and PB4, conducted in 2017, provide additional constraint for shallow (up to 5.5 feet bgs) impacts closer to Ghost Bank Slough. Petroleum-impacted soil is currently unbounded to the west under the former tank farm or to the east of Test Pits TP1 and TP4. The vertical extent of contamination is not known and extends to at least 14 feet bgs at the locations of Test Pits TP1 and TP4.

Groundwater

The duplicate water samples collected from Temporary Monitoring Well TW-TP3 contained concentrations of benzene (maximum of 178 µg/L), ethylbenzene (maximum of 22.3 µg/L), and 1,2,4-trimethylbenzene (maximum of 62.7 µg/L) exceeding the ADEC Table C cleanup levels of 4.6 µg/L, 15 µg/L, and 56 µg/L, respectively. GRO, DRO, nine other VOCs, 2-methylnaphthalene, and naphthalene were detected in at least one of the samples at concentrations less than the applicable ADEC cleanup levels. The remaining tested analytes were not detected.

QUALITY ASSURANCE SUMMARY

The project laboratories follow 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 isotope dilution analyses, 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 4).

Although less than the LOQ, a method blank contained estimated concentrations of DRO (0.227 J mg/L) and phenanthrene (0.0300 J ug/L). Samples are flagged "B" when the reported sample concentration is within 10 times the reported method blank concentration. Detected concentrations of DRO between 5 and 10 times the method blank detection in Samples TW-TP3 and TW-TP7 are flagged "B" at the detected value in Table 3. Estimated concentrations of phenanthrene were detected in Samples TW-TP3 and TW-TP7 at concentrations less than the LOQ; therefore, the sample concentrations are reported as non-detect at the LOQ and flagged "B" in Table 3

Surrogate recoveries for PAHs were greater than quality control (QC) criteria in Samples TW-TP3 and TW-TP7. The associated analytes for the surrogate recovery failures in samples were not detected; results are considered estimated and are reported as non-detect and flagged "J" in Table 3.

The RPD between the project sample and associated duplicate results is a measure of precision affected by matrix heterogeneity, sampling technique, and laboratory analyses. The ADEC recommends an RPD of less than 50 percent for duplicate soil samples and 30 percent for duplicate groundwater samples. The RPDs for GRO, 1,3,5-trimethylbenzene, 4-isopropyltoluene, isopropylbenzene, n-propylbenzene, sec-butylbenzene, and tert-butylbenzene 1 in groundwater duplicate set TW-TP3/TW-TP7 were greater than the recommended 30 percent for groundwater and are flagged "E" in Table 3. The remaining RPDs for duplicate sets TW-TP3/TW-TP7 and TP6-S7/TP6-S8 were either within QC criteria or could not be calculated due to non-detect sample results.

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 4. No non-conformances that would adversely affect the data quality or usability of the data were noted, with the exceptions discussed above.

CONCLUSIONS/RECOMMENDATIONS

Project activities consisted of evaluating former fuel supply lines, advancing six test pits, installing one temporary monitoring well, and collecting soil and groundwater samples. The tank farm located west of the project site was previously removed. Several sections of aboveground fuel pipes were observed east of the former tank farm. As-builts of the site and records relating to the tank farm we unable to be located by the Holy Cross Oil Company.

Based on the soil sampling efforts, petroleum-related contaminants exceeding the applicable ADEC Method Two cleanup levels were documented in samples collected from Test Pits TP1, TP2, and TP4. In addition, a soil sample collected from Test Pit TP4 contained 15,500 mg/kg DRO, which exceeds the ADEC Maximum Allowable Concentration, and a soil sample collected from Test Pit TP1 contained 33.4 mg/kg benzene and 172 mg/kg xylenes, which exceeds the ADEC Method Two Human Health cleanup levels.

The groundwater sample collected from Temporary Well TW-TP3 contained concentrations of benzene, ethylbenzene, and 1,2,4-trimethylbenzene at concentrations exceeding the ADEC Table C cleanup levels.

The horizontal and vertical extent of contamination is currently not known. Shannon & Wilson recommends conducting further investigation of soil and groundwater at the site to determine the nature and extent of impacts. Additionally, due to the proximity of groundwater and soil impacts to Ghost Bank Slough, investigation of possible surface water and sediment exposure pathways should be conducted. While impacts have not fully been delineated, options for site cleanup should be considered prior to further on-site work, given the remote nature of the site and associated mobilization costs.

CLOSURE/LIMITATIONS

This report is prepared for the exclusive use of our client and their representatives in the study of this site. The findings presented within this report are based on the limited sampling and analyses that were conducted. They should not be construed as definite conclusions regarding soil and groundwater at the site. As a result, the sampling, analyses, and data interpretations can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantee that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. 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.

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

Shannon & Wilson has prepared the information in Attachment 5, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our report.

Sincerely,

SHANNON & WILSON

Alex Geilich

Digitally signed by Alex Geilich
Date: 2022.02.14 14:40:58 -09'00'

Alex Geilich
Senior Environmental Scientist

Enc. Tables 1, 2, and 3; Figures 1 and 2; and Attachments 1 through 5

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet)**	Headspace (ppm) ^^
Soil Samples				
Test Pit TP1				
TP1-S1	8/3/2021	Test Pit TP1, Sample S1	0-2	482
TP1-S2	8/3/2021	Test Pit TP1, Sample S2	2-4	796
TP1-S3	8/3/2021	Test Pit TP1, Sample S3	4-6	520
TP1-S4	8/3/2021	Test Pit TP1, Sample S4	6-8	602
TP1-S5	8/3/2021	Test Pit TP1, Sample S5	8-10	1,070
* TP1-S6	8/3/2021	Test Pit TP1, Sample S6	10-12	1,186
* TP1-S7	8/3/2021	Test Pit TP1, Sample S7	12-14	1,153
Test Pit TP2				
TP2-S1	8/3/2021	Test Pit TP2, Sample S1	0-2	76
TP2-S2	8/3/2021	Test Pit TP2, Sample S2	2-4	58
TP2-S3	8/3/2021	Test Pit TP2, Sample S3	4-6	213
* TP2-S4	8/3/2021	Test Pit TP2, Sample S4	6-8	391
TP2-S5	8/3/2021	Test Pit TP2, Sample S5	8-10	5.6
* TP2-S6	8/3/2021	Test Pit TP2, Sample S6	10-12	824
TP2-S7	8/3/2021	Test Pit TP2, Sample S7	12-14	227
TP2-S8	8/3/2021	Test Pit TP2, Sample S8	14-15	71
Test Pit TP3				
* TP3-S1	8/3/2021	Test Pit TP3, Sample S1	0-2	1.4
TP3-S2	8/3/2021	Test Pit TP3, Sample S2	2-4	0.7
TP3-S3	8/3/2021	Test Pit TP3, Sample S3	4-6	1.3
TP3-S4	8/3/2021	Test Pit TP3, Sample S4	6-8	0.7
* TP3-S5	8/3/2021	Test Pit TP3, Sample S5	8-10	0.8
TP3-S6	8/3/2021	Test Pit TP3, Sample S6	10-12	1.1
TP3-S7	8/3/2021	Test Pit TP3, Sample S7	12-14	0.7
TP3-S8	8/3/2021	Test Pit TP3, Sample S8	14-16	0.4
Test Pit TP4				
TP4-S1	8/3/2021	Test Pit TP4, Sample S1	0-2	10.3
TP4-S2	8/3/2021	Test Pit TP4, Sample S2	2-4	2.4
TP4-S3	8/3/2021	Test Pit TP4, Sample S3	4-6	2.2
TP4-S4	8/3/2021	Test Pit TP4, Sample S4	6-8	2.9
* TP4-S5	8/3/2021	Test Pit TP4, Sample S5	8-10	11.6
TP4-S6	8/3/2021	Test Pit TP4, Sample S6	10-12	6.5
* TP4-S7	8/3/2021	Test Pit TP4, Sample S7	12-14	5.9
Test Pit TP5				
TP5-S1	8/4/2021	Test Pit TP5, Sample S1	0-2	0.0
* TP5-S2	8/4/2021	Test Pit TP5, Sample S2	2-4	2.2
TP5-S3	8/4/2021	Test Pit TP5, Sample S3	4-6	0.7
TP5-S4	8/4/2021	Test Pit TP5 Sample S4	6-8	0.5
TP5-S5	8/4/2021	Test Pit TP5 Sample S5	8-10	0.2
* TP5-S6	8/4/2021	Test Pit TP5 Sample S6	10-12	0.0
TP5-S7	8/4/2021	Test Pit TP5 Sample S7	12-13	0.3
Test Pit TP6				
TP6-S1	8/4/2021	Test Pit TP6, Sample S1	0-2	0.7
TP6-S2	8/4/2021	Test Pit TP6, Sample S2	2-4	0.3
* TP6-S3	8/4/2021	Test Pit TP6, Sample S3	4-6	0.9
TP6-S4	8/4/2021	Test Pit TP6, Sample S4	6-8	0.5
TP6-S5	8/4/2021	Test Pit TP6, Sample S5	8-10	0.2
TP6-S6	8/4/2021	Test Pit TP6, Sample S6	10-12	0.7
* TP6-S7	8/4/2021	Test Pit TP6, Sample S7	12-13.5	0.9
* TP6-S8	8/4/2021	Duplicate of Sample TP6-S8	12-13.5	0.9

See notes on Page 2.

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet)**	Headspace (ppm) ^^
Groundwater Samples				
* TW-TP3	8/4/2021	Temporary Well TW-TP3	1.86	-
* TW-TP7	8/4/2021	Duplicate of TW-TP3	1.86	-
Quality Control Samples				
* TB-S1	8/3/2021	Trip Blank	-	-
* TB-W1	8/4/2021	Trip Blank	-	-

Notes:

* = Sample analyzed by the project laboratory (See Tables 2 and 3).

** = Depth in feet below ground surface

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

bgs = below ground surface

ppm = parts per million.

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS

Parameter Tested	Units	Method*	Cleanup Level (mg/kg)**	Test Pit ID, Sample ID Number^, and Collection Depth in Feet Below Ground Surface (Table 1, Figure 2, and Attachment 3)													
				TP1		TP2		TP3		TP4		TP5		TP6			Trip Blank
				TP1-S6 10-12	TP1-S7 12-14	TP2-S4 6-8	TP2-S6 10-12	TP3-S1 0-2	TP3-S5 8-10	TP4-S5 8-10	TP4-S7 12-14	TP5-S2 2-4	TP5-S6 10-12	TP6-S3 4-6	TP6-S7 12-13.5	TP6-S8~ 12-13.5	TB-S1 -
PID Headspace Reading	ppm	OVM 580B	-	1,186	1,153	391	824	1.4	0.8	11.6	5.9	2.2	0.0	0.9	0.9	0.9	-
Gasoline Range Organics (GRO)	mg/kg	AK 101	300	**190 J+**	**917 J+**	**44.7 J+**	**39.7 J+**	**2.12 J**	<1.98	**2.11 J**	**14.6**	**4.06 J**	**1.22 J**	<2.19	<1.65	<1.53	<1.25
Diesel Range Organics (DRO)	mg/kg	AK 102	250	**42.8**	**138**	<12.7	**132**	**9.55 J**	<13.7	**15,500**	<13.7	**17.4 J**	<13.2	**8.52 J**	<12.8	<12.6	-
Volatile Organic Compounds (VOCs)																	
Benzene	mg/kg	EPA 8021B / 8260D	0.022	**3.08**	**33.4**	**1.92**	**3.05**	**0.0127 J**	<0.00990	**0.0289**	**1.08**	**0.0220 J**	**0.00873 J**	<0.0109	**0.0164**	**0.0144 J**	<0.00625
Toluene	mg/kg	EPA 8021B / 8260D	6.7	**23.6**	**173**	**6.81**	**6.63**	**0.0374 J**	<0.0198	**0.0360 J**	**0.058**	**0.0532**	<0.0199	<0.0219	<0.0164	<0.0153	<0.0125
Ethylbenzene	mg/kg	EPA 8021B / 8260D	0.13	**4.55**	**27.4**	**1.17**	**0.989**	<0.0334	<0.0198	<0.0254	**0.847**	**0.0298 J**	<0.0199	<0.0219	<0.0164	<0.0153	<0.0125
Xylenes (Total)	mg/kg	EPA 8021B / 8260D	1.5	**49.3**	**172**	**8.55**	**7.08**	**0.0782 J**	<0.0595	**0.116 J**	**3.8**	**0.134 J**	<0.0595	<0.0660	<0.0493	<0.0460	<0.0375
1,2,4-Trimethylbenzene	mg/kg	EPA 8260D	0.61	**13.5**	**25.1**	-	-	-	-	-	-	-	-	-	-	-	<0.0251
1,2-Dibromoethane	mg/kg	EPA 8260D	0.00024	**0.0412**	<0.0435	-	-	-	-	-	-	-	-	-	-	-	<0.000500
1,3,5-Trimethylbenzene	mg/kg	EPA 8260D	0.66	**3.72**	**10.1**	-	-	-	-	-	-	-	-	-	-	-	<0.0125
4-Isopropyltoluene	mg/kg	EPA 8260D	-	**0.825**	**2.63 J**	-	-	-	-	-	-	-	-	-	-	-	<0.0500
Chloroform	mg/kg	EPA 8260D	0.0071	<0.00344	**0.109 J**	-	-	-	-	-	-	-	-	-	-	-	<0.00200
Isopropylbenzene (Cumene)	mg/kg	EPA 8260D	5.6	**1.18**	**5.44**	-	-	-	-	-	-	-	-	-	-	-	<0.0125
Naphthalene	mg/kg	EPA 8260D	0.038	**0.358**	<1.09	-	-	-	-	-	-	-	-	-	-	-	<0.0125
n-Propylbenzene	mg/kg	EPA 8260D	9.1	**2.08**	**8.29**	-	-	-	-	-	-	-	-	-	-	-	<0.0125
sec-Butylbenzene	mg/kg	EPA 8260D	28	**0.361**	**1.35 J**	-	-	-	-	-	-	-	-	-	-	-	<0.0125
Other VOCs	mg/kg	EPA 8260D	various	ND	ND	-	-	-	-	-	-	-	-	-	-	-	ND
Polynuclear Aromatic Hydrocarbons (PAHs)																	
1-Methylnaphthalene	mg/kg	EPA 8270D-SIM	0.41	**0.181**	**0.0575**	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	mg/kg	EPA 8270D-SIM	1.3	**0.194**	**0.0695**	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	mg/kg	EPA 8270D-SIM	0.038	**0.139**	**0.11**	-	-	-	-	-	-	-	-	-	-	-	-
Other PAHs	mg/kg	EPA 8270D-SIM	various	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

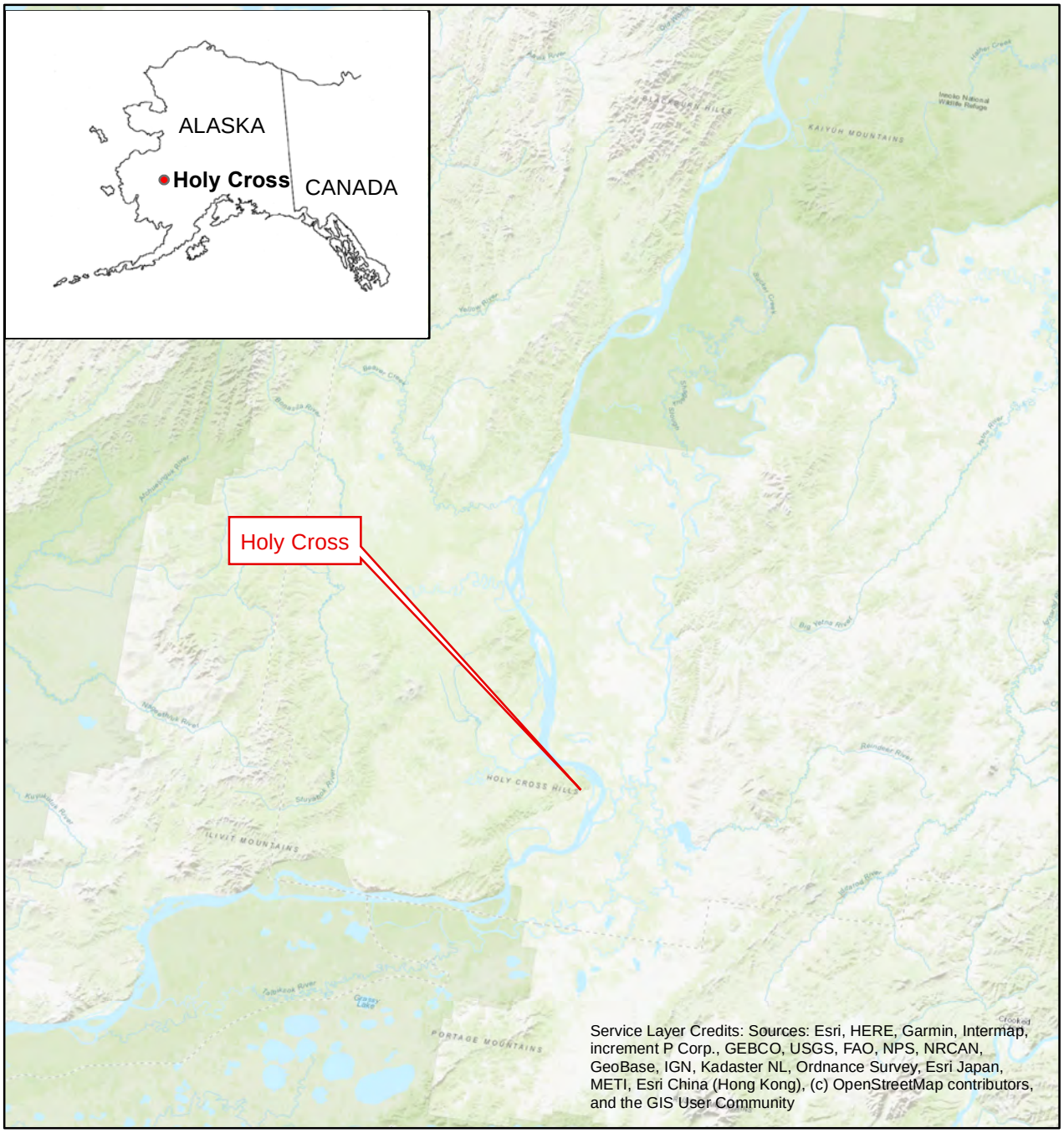
^	= Sample ID number preceded by "106942-" on the chain of custody form
*	= See Attachment 4 for compounds tested, methods, and laboratory reporting limits
**	= ADEC soil cleanup level is the Method Two standard listed in Table B1 or B2, 18 AAC 75 (June 2021)
PID	= Photoionization detector
ppm	= Parts per million
mg/kg	= Milligrams per kilogram
917	= Analyte detected above ADEC cleanup level
<0.0199	= Analyte not detected; laboratory limit of detection of 0.0199 mg/kg
132	= Analyte detected
-	= Not applicable or sample not tested for this analyte
~	= Duplicate of preceeding sample
J	= Estimated concentration less than the limit of quantitation. See the SGS laboratory report for details.
J+	= Analytical result is potentially biased high due to surrogate failure. See ADEC LDRC in Attachment 4 for details.
ND	= Not detected

TABLE 3
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Parameter Tested	Units	Method*	Cleanup Level (ug/L)**	Sample ID Number^ and Depth in Feet to Groundwater (Table 1, Figure 2, and Attachment 3)		
				TW-TP3		Trip Blank
				TW-TP3	TW-TP7~	TB-W1
				1.86	1.86	-
Gasoline Range Organics (GRO)	µg/L	AK 101	2,200	**844 E**	**50.1 J, E**	<50
Diesel Range Organics (DRO)	µg/L	AK 102	1,500	**892 B**	**848 B**	-
Volatile Organic Compounds (VOCs)						
Benzene	µg/L	EPA 8260D	4.6	**147**	**178**	<0.200
Toluene	µg/L	EPA 8260D	1,100	**30.5**	**33.7**	<0.500
Ethylbenzene	µg/L	EPA 8260D	15	**17.9**	**22.3**	<0.500
Xylenes (Total)	µg/L	EPA 8260D	190	**92.6**	**122**	<1.50
1,2,4-Trimethylbenzene	µg/L	EPA 8260D	56	**47.1**	**62.7**	<0.500
1,3,5-Trimethylbenzene	µg/L	EPA 8260D	60	**22.9 E**	**31.2 E**	<0.500
4-Isopropyltoluene	µg/L	EPA 8260D	-	**1.62 E**	**9.64 E**	<0.500
Isopropylbenzene (Cumene)	µg/L	EPA 8260D	450	**7.03 E**	**9.95 E**	<0.500
Naphthalene	µg/L	EPA 8260D	1.7	<0.500	**0.490 J**	<0.500
n-Propylbenzene	µg/L	EPA 8260D	660	**8.72 E**	**11.8 E**	<0.500
sec-Butylbenzene	µg/L	EPA 8260D	2,000	**2.43 E**	**4.85 E**	<0.500
tert-Butylbenzene	µg/L	EPA 8260D	690	**0.392 J, E**	**0.561 J, E**	<0.500
Other VOCs	µg/L	EPA 8260D	various	ND	ND	ND
Polynuclear Aromatic Hydrocarbons (PAHs)						
2-Methylnaphthalene	µg/L	EPA 8270D-SIM	36	<0.0255	**0.0337 J**	-
Naphthalene	µg/L	EPA 8270D-SIM	1.7	<0.0510	**0.106 J**	-
Phenanthrene	µg/L	EPA 8270D-SIM	170	<0.0500 B	<0.0500 B	-
Other PAHs	µg/L	EPA 8270D-SIM	various	ND	ND	-

Notes:

^	= Sample ID number preceded by "106942-" on the chain of custody form
*	= See Attachment 4 for compounds tested, methods, and laboratory reporting limits
**	= Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (June 2021)
mg/L	= Milligrams per liter
ug/L	= Micrograms per liter
147	= Analyte detected above ADEC cleanup level
<0.500	= Analyte not detected; laboratory limit of detection of 0.500 ug/L mg/kg
30.5	= Analyte detected
-	= Not applicable or sample not tested for this analyte
~	= Duplicate of preceeding sample
J	= Estimated concentration less than the limit of quantitation. See the SGS laboratory report for details.
B	= Analyte concentration is potentially affected by method blank detection. See ADEC Laboratory Data Review Checklist for details.
E	= Result is an estimate due to a primary/field duplicate sample pair relative percent difference (RPD) failure. See ADEC Laboratory Data Review Checklist for details.
ND	= Not detected



N

0 20 40

Miles

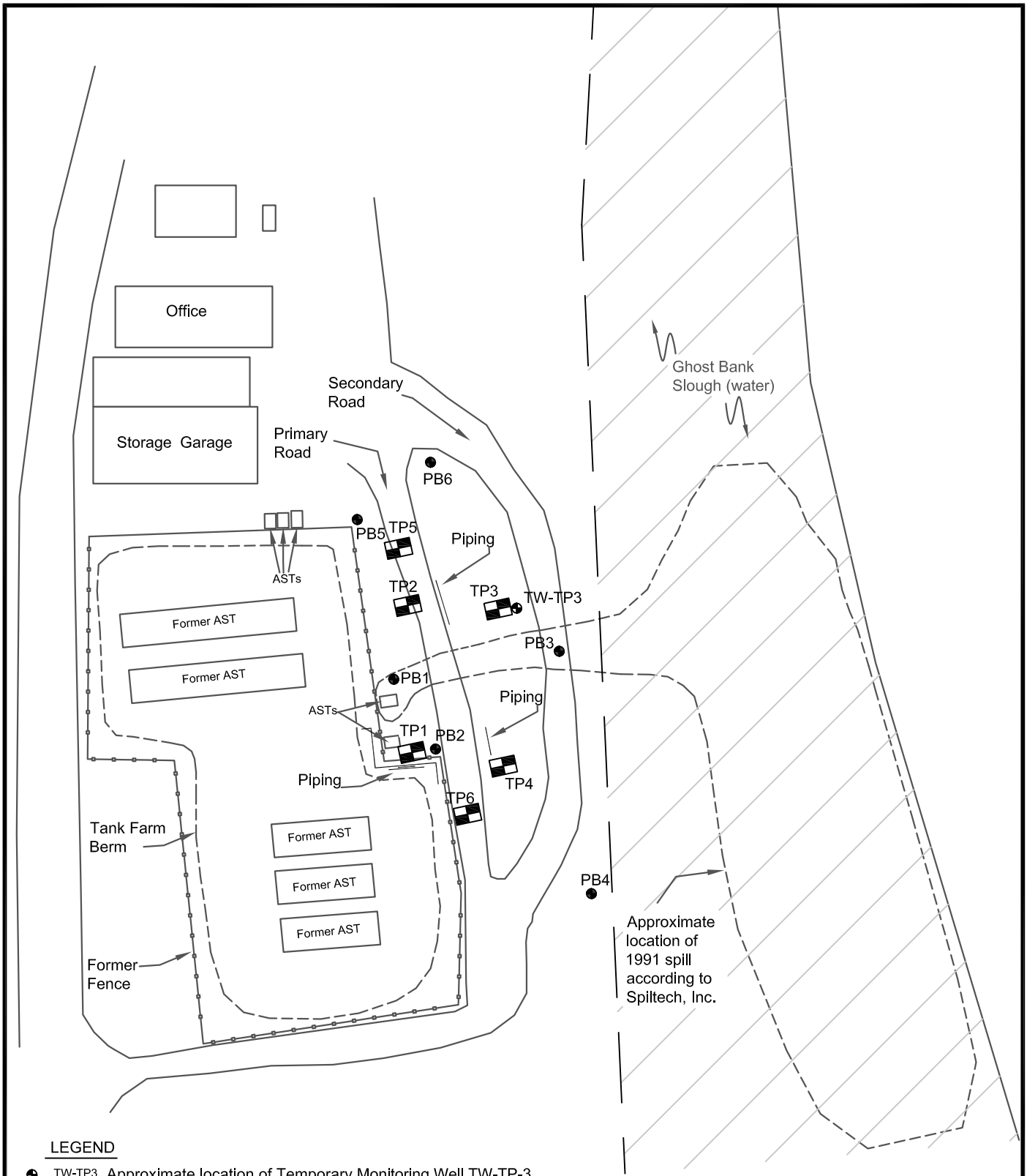
Holy Cross Oil Company Site
Holy Cross, Alaska

VICINITY MAP

February 2022 106942-001

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1



LEGEND

- TW-TP3 — Approximate location of Temporary Monitoring Well TW-TP-3 advanced by Shannon & Wilson on August 4, 2021.
- TP — Approximate location of Test Pit advanced by Shannon & Wilson on August 3 and 4, 2021.
- PB1 — Approximate location of Hand Boring PB1 advanced by Shannon & Wilson on July 12, 2017.
- AST — Aboveground Storage Tank

0 25 50 100

APPROXIMATE SCALE IN FEET

N

HOLY CROSS OIL COMPANY SITE
HOLY CROSS, ALASKA

SITE PLAN

JANUARY 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

FIG. 2

Attachment 1

SITE PHOTOGRAPHS

PHOTOS 1 & 2

Photo 1: Aboveground piping visible north of Test Pit TP4, view west. (August 4, 2021)

Photo 2: Aboveground piping south of Test Pit 1, view south. (August 4, 2021)

PHOTOS 3 & 4

Photo 3: Excavating Test Pit TP2, view south. (August 3, 2021)

Photo 4: Excavating Test Pit TP1, view northeast. (August 3, 2021)

PHOTOS 5 & 6

Photo 5: Test Pit TP3, view west. (August 3, 2021)

Photo 6: Installing Temporary Monitoring Well TW-TP3, view north. (August 3, 2021)

Attachment 2

FIELD NOTES

A Geilich Holy Cross O.I 8/3/21
Z Thon Company

0800 Arrive at Ryan Air to Fly to Holy Cross
0900 Land in Holy Cross, check in w/ Ploydaat for lodging.
1000 on site, mark Test pit locations
1015 Meet w/ Eugene (Tribal corp) as excavator is brought over. He has spoken w/ utily operator. Water line is buried 4 ft from main road. Former fuel line is abandonded in place
1045 Begin excavation of TP2
1200 Reach 15 ft bgs. Excavator cannot dig deeper. Leave excavation open for ~20 min. No water collects in excavation. Backfill Collect samples (filled as excavation progressed)
106942 - TP2 - S4 time = 1110
106942 - TP2 - S6 time = 1130
1215 Begin test Pit TP1
300 Reach 14 ft bgs. At end of excavator reach. End of test pit.
1316 Backfill TP1

Scale: 1 square = _____

Scale: 1 square = _____

A Gelich, Z Thon — Holy Cross Company — 8/3/21

Samples collected in TP1

106942-TP1-56 time = 1250

106942-TP1-57 time = 1300

1330 Move to TP4, begin to excavate

1440 Finish excavating. Backfill pit

Samples collected in TP4

106942-TP4-57 time = 1440

106942-TP4-55 time = 1410

1505 Move to TP3, begin excavating

1550 Reach 16 Ft bgs, at end of excavator reach. Place temporary 1 inch PVC monitoring well in pit. TD on well is 14.8 ft due to partial collapse as placing sam

Samples collected in TP3:

106942-TP3-51 time = 1510

106942-TP3-55 time = 1540

1645 Off site for day. Organize samples at lodging

1715 Name trip blank (soil)

106942-TB-51

1745 EOD.

AG

Scale: 1 square = _____

A Gelich, Z Thon — Holy Cross Company — 8/4/21

0800 Meet Sean (operator) and prepare to begin further test pits to delineate contamination found in TP1 and TP2

0835 Begin TP5, North of TP2.

0920 End test pit at 13 Ft, Backfill

Samples collected in TP5

106942-TP5-52 time = 945

106942-TP5-56 time = 910

0945 Begin test pit TP6, southeast of TP1

1025 End test pit at 135 ft. Backfill

Samples collected in TP6

106942-TP6-53 time = 1010

106942-TP6-57 time = 1025

106942-TP6-58 time = 1040

Sample 58 is a duplicate of 57

1045 Check well placed in TP3 for groundwater. well has a kink in it and bailer can not go down. Well has water at ~9 ft relative to test pit log. (TP3 dug on slope rising to west)

1110 Will dig new test pit directly

Scale: 1 square = _____

next to TP3 for placement of new well.
1130 well placed. Ground is ~7 ft lower relative to test pit log.
1305 Check well for GW, GW at 1.86 ft bgs. Level of slough is ~3 ft lower than ground.
1305 Collect sample 106942-TW-TP3 and duplicate 106942-TW-TP7 w/ time = 1345. TD of well = 7.1 bgs. Name trip blank 106942-TB-W1
1330 Fuel excavator
1340 Decon temp well
1400 Scan off site w/ Excavator. Back at loading. Org samples and gear, pack.
1700 Go to dump
1730 Finish labelling samples, EOD

Scale: 1 square = _____

Scale: 1 square = _____

FIELD LOG OF TEST PIT

LOGGED BY: AG SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NO: 106942 DATE: 8/3/21 LOCATION: _____

LOG OF TEST PIT TP1 PID

PROJECT: Holy Cross Oil

Sketch of North Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
0-0.5 organics Brown silty sand, moist fuel odor		482	S1	0
as above		796	S2	2
		520	S3	4
as above. strong fuel odor, fresh/unweathered		602	S4	6
		1,070	S5	8
		1,186	S6	10
NOTE				12

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: _____ SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NO: _____ DATE: _____ LOCATION: _____

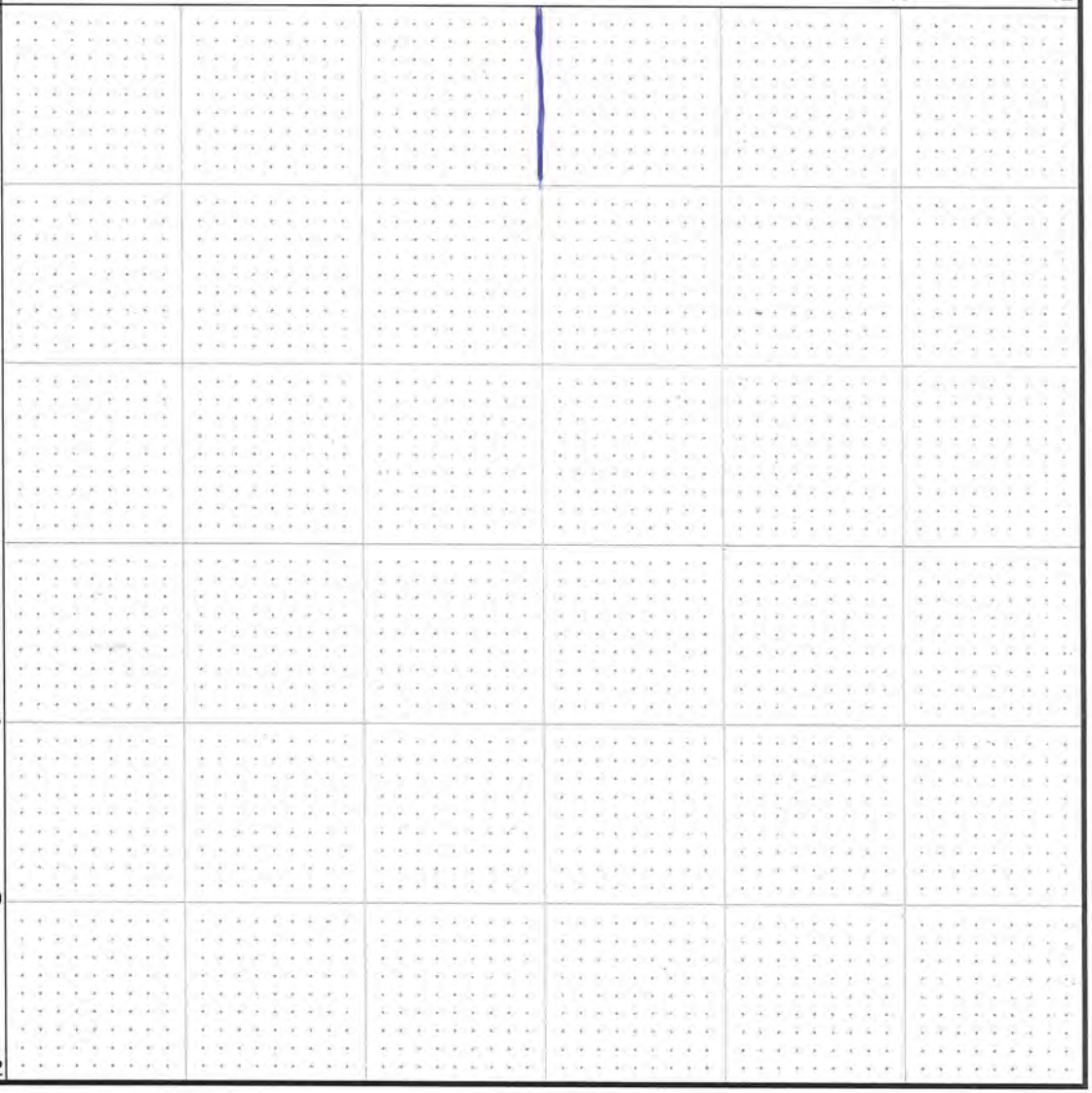
LOG OF TEST PIT TP1 PID

PROJECT: _____

Sketch of North Pit Side — Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

SOIL DESCRIPTION	Ground Water	~~% Water Content~~	Samples	Depth, Ft.
on prev page				0
as above, moist, strong fuel odor ~Moist to wet		1,153	S7	2
14 ft bgs. End of test pit. Can not excavate further	▽			4
				6
				8
				10
				12



NOTE

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: AG SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NO: 106942 DATE: 8/3 LOCATION: Holy Cross

LOG OF TEST PIT TP2 (PID ppm) PROJECT: _____

Sketch of West Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
Organics 0-0.5				0
Grey sand w/ silt, moist Fuel odor		76	S1	2
as above, no odor ↓		58	S2	4
		213	S3	6
		391	S4	8
Brown sand w/ silt moist		5.6	S5	10
NOTE: Grey silt w/ sand. moist to wet. fuel odor		824	S6	12

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: _____ SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP2 / TP2 #6

JOB NO: _____ DATE: _____ LOCATION: _____

PROJECT: _____

PID (ppm)

Sketch of West Pit Side — Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet: 0 2 4 6 8 10 12

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
On prev page				0
				2
as above, wet		227	S7	
	13 ▽			4
		71	S8	
15 Ft bgs. End of test pit due to end of excavator reach				6
				8
				10
				12

NOTE

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: AG SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP3 PID

JOB NO: 106942 DATE: 8/3 LOCATION: _____

PROJECT: Holy Cross 0:1

1505

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
Brown silty sand, moist no odor. Garbage (cat jars, bottles, wire at 2 Ft bgs)		1.4	S1	0
				2
ay above		0.7	S2	
				4
		1.3	S3	
				6
Brown silt, moist		0.7	S4	
				8
Brown silty sand, wet	▽	0.8	S5	
				10
NOTE as above		1.1	S6	
				12

Sketch of West Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

0 2 4 6 8 10 12

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: _____ SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP 3 PID

JOB NO: 106942 DATE: _____ LOCATION: _____

PROJECT: _____

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
previous page				0
Brown sandy silt, wet		0.7	S7	2
		0.4	S8	4
16 ft, end of test pit. Place 1 inch diameter temporary well in p.t. TD of well is 14.8 ft.				6
				8
				10
				12

Sketch of West Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

0 2 4 6 8 10 12

NOTE

FIG.

1556

FIELD LOG OF TEST PIT

LOGGED BY: AG SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP4 PID (ppm)

JOB NO: 106942 DATE: 8/3/21 LOCATION: _____

PROJECT: Holy Cross O.I

1330

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
Brown silty sand, moist No odor		10.3	S1	0
as above		2.4	S2	2
		2.2	S3	4
		2.9	S4	6
		11.6	S5	8
NOTE		6.5	S6	10
				12

Sketch of NW Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

0 2 4 6 8 10 12

FIG.

Filename: J:\Support\library\FIELD AND LAB FORMS\AutoCAD_Field Log of Test Pit.dwg Date: 08-23-2006 Login: Sandy Cottrell

FIELD LOG OF TEST PIT

LOGGED BY: _____ SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP4

JOB NO: _____ DATE: _____ LOCATION: _____

PROJECT: _____

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
On prev page				0
Brown silt, sand, moist				2
+3	▽	5.9	S7	
Gry silt w/ sand, wet fuel odor				4
				6
				8
				10
				12

Sketch of _____ Pit Side

Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

0 2 4 6 8 10 12

1440

NOTE

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: AG SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP5

JOB NO: 106942 DATE: 8/4/21 LOCATION: _____

PROJECT: Holy Cross Oil

Sketch of North Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

SOIL DESCRIPTION	Ground Water	PID (ppm) % Water Content	Samples	Depth, Ft.
0835 0-1 Grey silty gravel w/ sand (Fill), moist, slight fuel odor		0.0	S1	0
1-2 brown silty sand, moist no odor				2
		2.2	S2	
aa above				4
		0.7	S3	
				6
		0.5	S4	
				8
		0.2	S5	
				10
NOTE				
as above, moist to wet, increasing silt.		0.0	S6	12

FIG.

Filename: J:\Support\library\FIELD AND LAB FORMS\AutoCAD_Field Log of Test Pit.dwg Date: 08-23-2006 Login: Sandy Cottrell

FIELD LOG OF TEST PIT

LOGGED BY: _____ SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

JOB NO: _____ DATE: _____ LOCATION: _____

LOG OF TEST PIT TP5 PID (ppm) PROJECT: _____

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
on prev page				0
grey silt w/ sand, wet	▽	0.3	57	2
0920 — 13.5 ft end of test pit, at end of excavator reach				4
				6
				8
				10
				12

Sketch of _____ Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

0 2 4 6 8 10 12

NOTE

FIG.

Filename: J:\Support\library\FIELD AND LAB FORMS\AutoCAD_Field Log of Test Pit.dwg Date: 08-23-2006 Login: Sandy Cottrell

FIELD LOG OF TEST PIT

LOGGED BY: AG SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP6

JOB NO: 106942 DATE: 8/4/21 LOCATION: _____

PROJECT: Holy Cross O.I

PID (ppm)

SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
0945 0-0.5 gravel w/ silt and sand (fill), moist				0
1-2 Brown silty sand, moist, no odor.		0.7	S1	
Brown & gray sand w/ silt moist		0.3	S2	2
		0.9	S3	4
as above				
Brown and gray sand, moist		0.5	S4	6
				8
Brown silty sand, moist		0.2	S5	
				10
NOTE		0.7	S6	
as above				12

Sketch of West Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

0 2 4 6 8 10 12

FIG.

FIELD LOG OF TEST PIT

LOGGED BY: _____ SUBCONTRACTOR: _____

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

LOG OF TEST PIT TP6 PID

JOB NO: 106942 DATE: _____ LOCATION: _____

PROJECT: _____

Sketch of _____ Pit Side Surface Elevation: Approx. ____ Ft.

Horizontal Distance in Feet

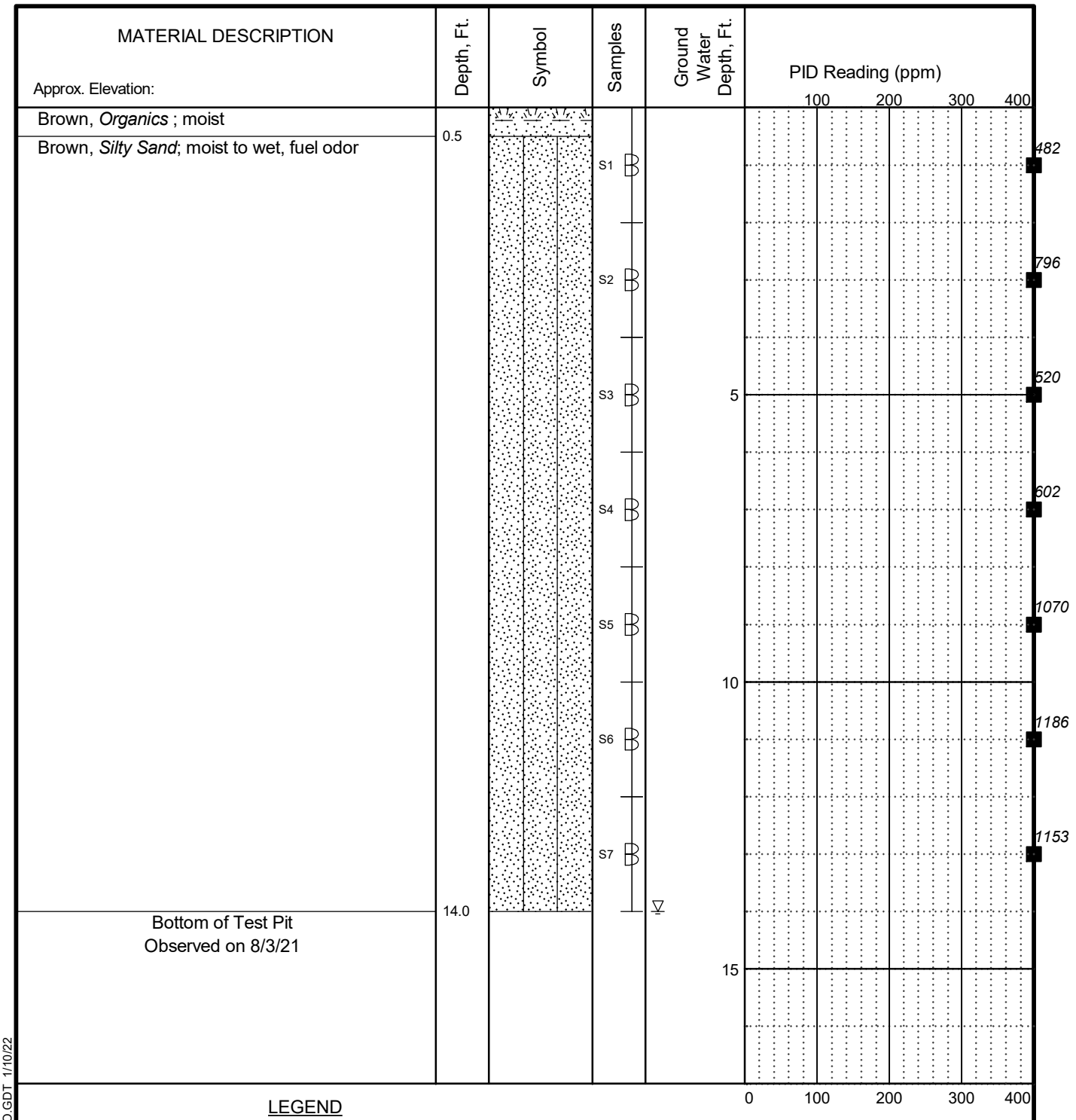
SOIL DESCRIPTION	Ground Water	% Water Content	Samples	Depth, Ft.
on prev page				0
				2
1025 Gray silt w/ sand, moist to wet	▽	09	S7	
13.5 Ft, end of test pit				4
~13 Ft				6
				8
				10
				12

NOTE

FIG.

Attachment 3

TEST PIT LOGS



LEGEND

▽ Ground Water Level At Time Of Excavation

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Holy Cross Oil Company Site
Holy Cross, Alaska

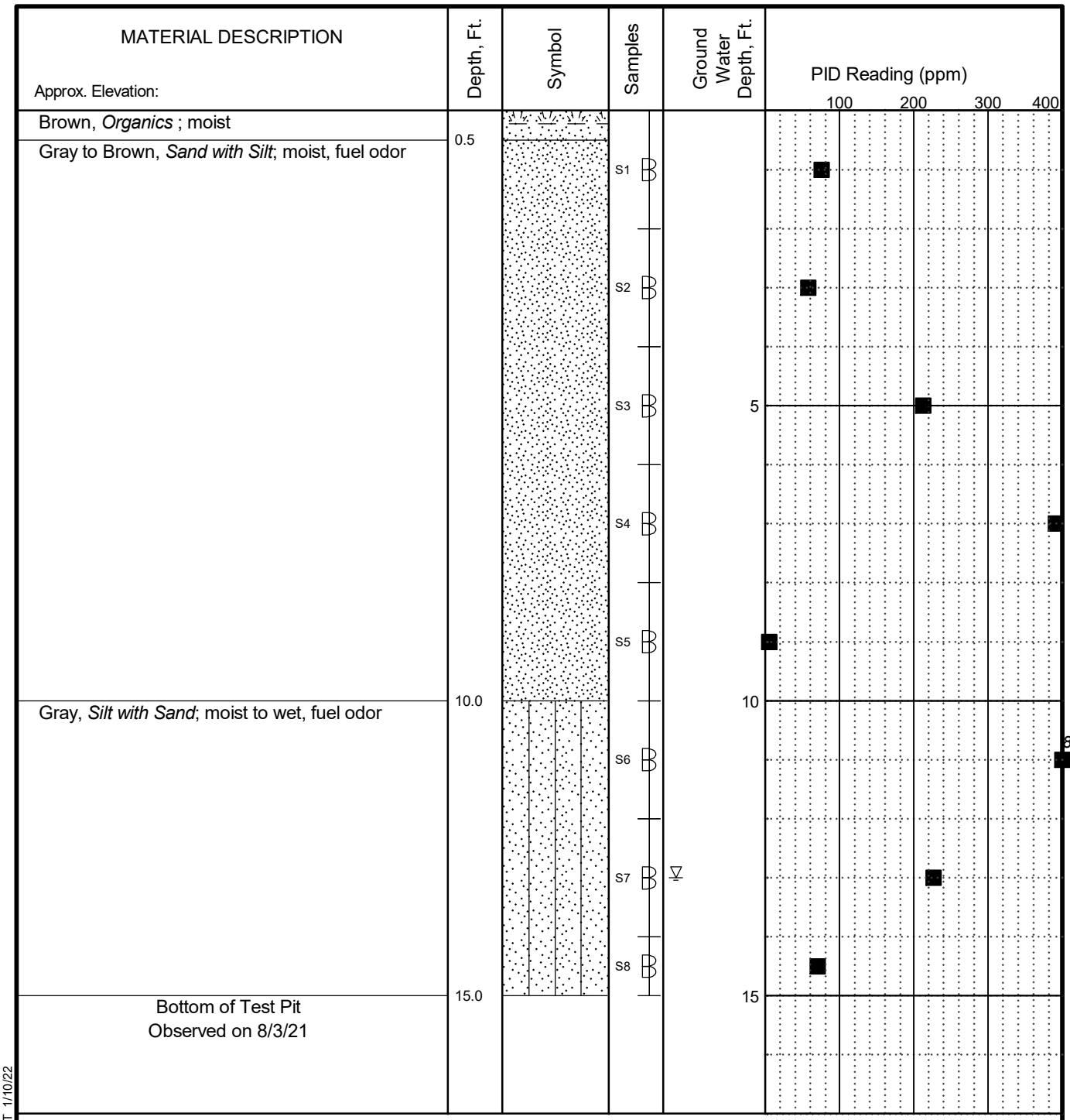
LOG OF TEST PIT TP1

February 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3-1

TEST_PIT TEST PIT LOGS WITHOUT WELL.GPJ S&W_GEO.GDT 1/10/22



LEGEND

▽ Ground Water Level At Time Of Excavation

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Holy Cross Oil Company Site
Holy Cross, Alaska

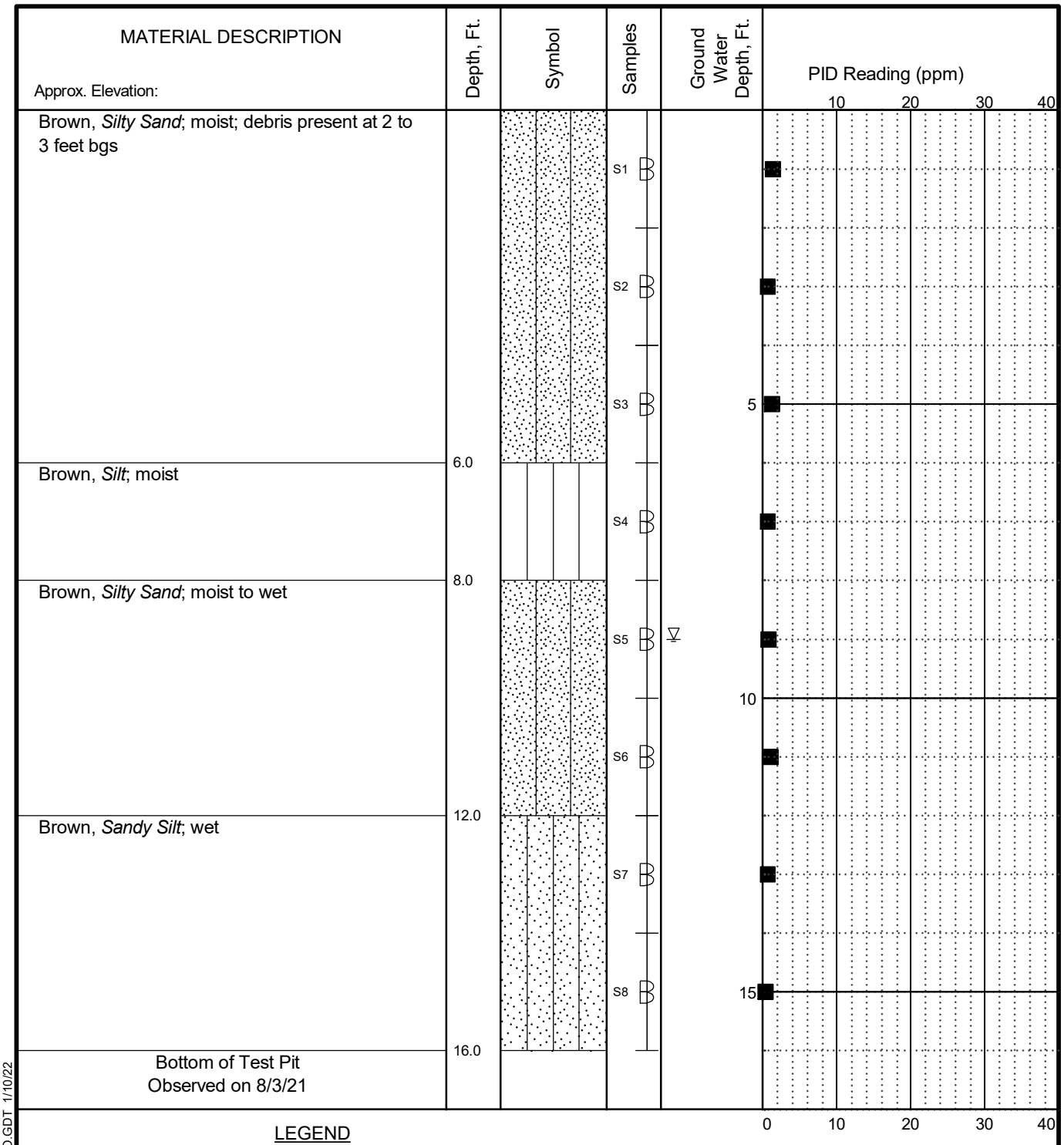
LOG OF TEST PIT TP2

February 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3-2

TEST PIT TEST PIT LOGS WITHOUT WELL.GPJ S&W GEO.GDT 1/10/22



LEGEND

▽ Ground Water Level At Time Of Excavation

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Holy Cross Oil Company Site
Holy Cross, Alaska

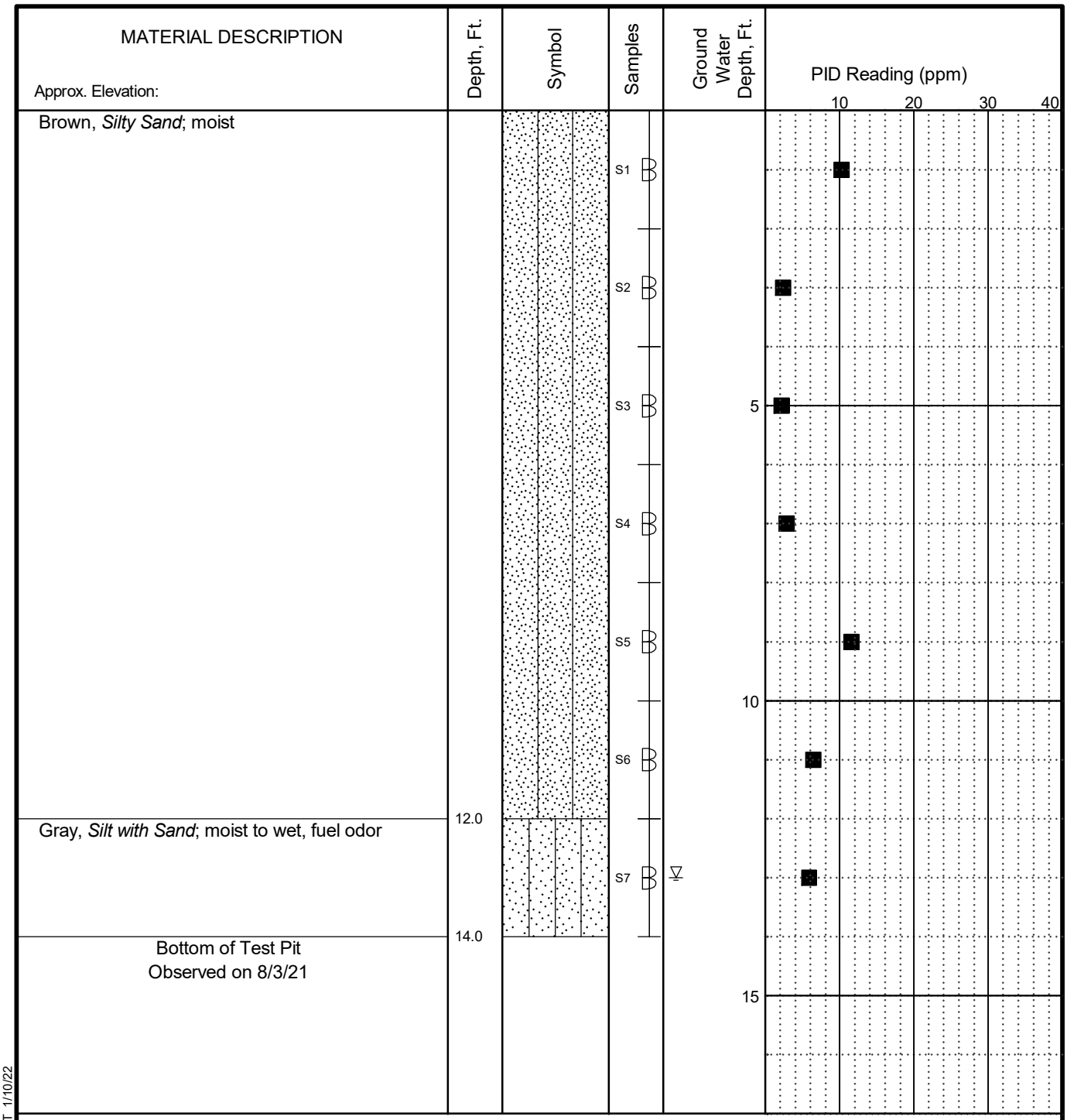
LOG OF TEST PIT TP3

February 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3-3

TEST PIT TEST PIT LOGS WITHOUT WELL.GPJ S&W GEO.GDT 1/10/22



LEGEND

▽ Ground Water Level At Time Of Excavation

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Holy Cross Oil Company Site
Holy Cross, Alaska

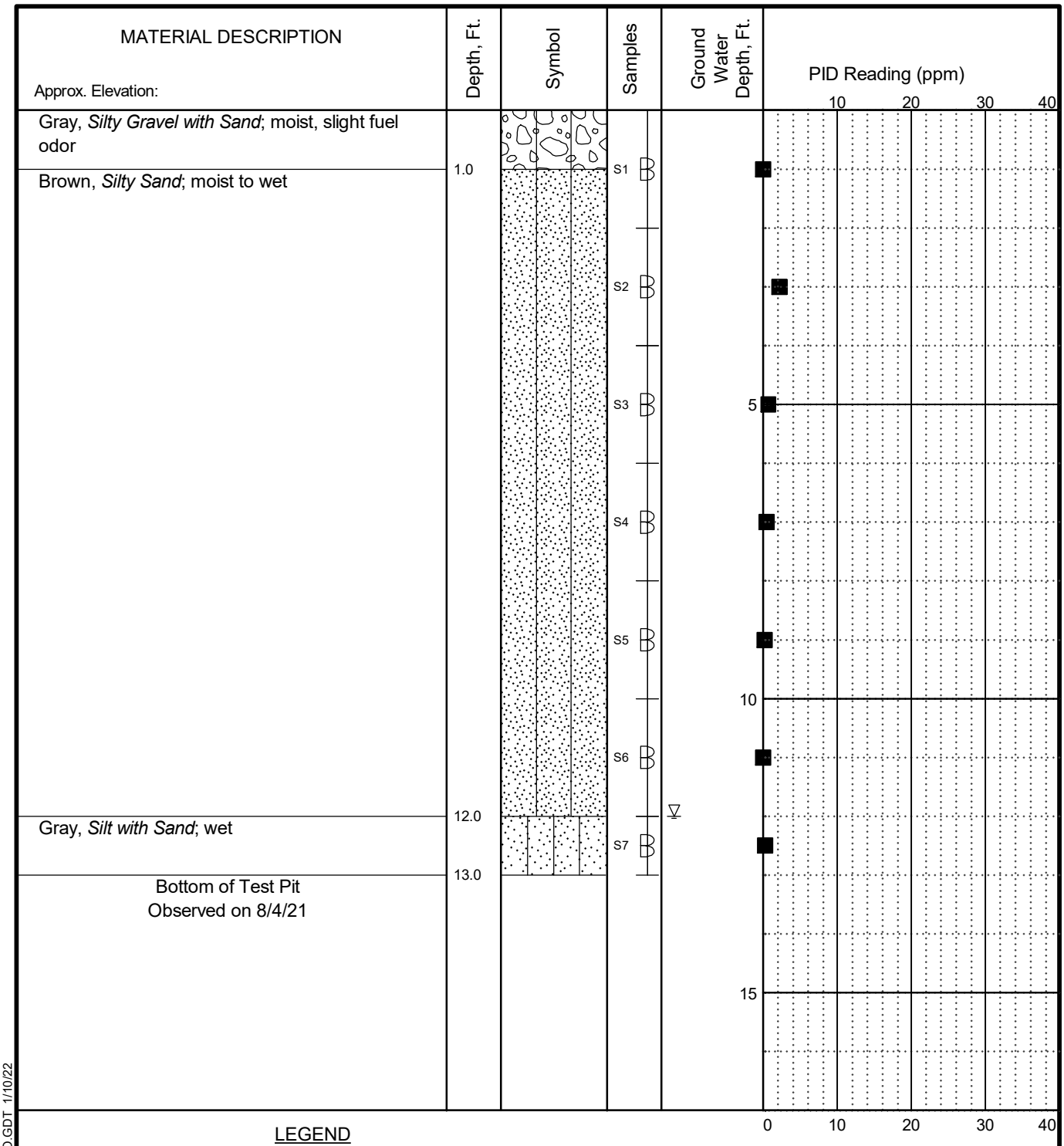
LOG OF TEST PIT TP4

February 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3-4

TEST PIT TEST PIT LOGS WITHOUT WELL.GPJ S&W GEO.GDT 1/10/22



LEGEND

▽ Ground Water Level At Time Of Excavation

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Holy Cross Oil Company Site
Holy Cross, Alaska

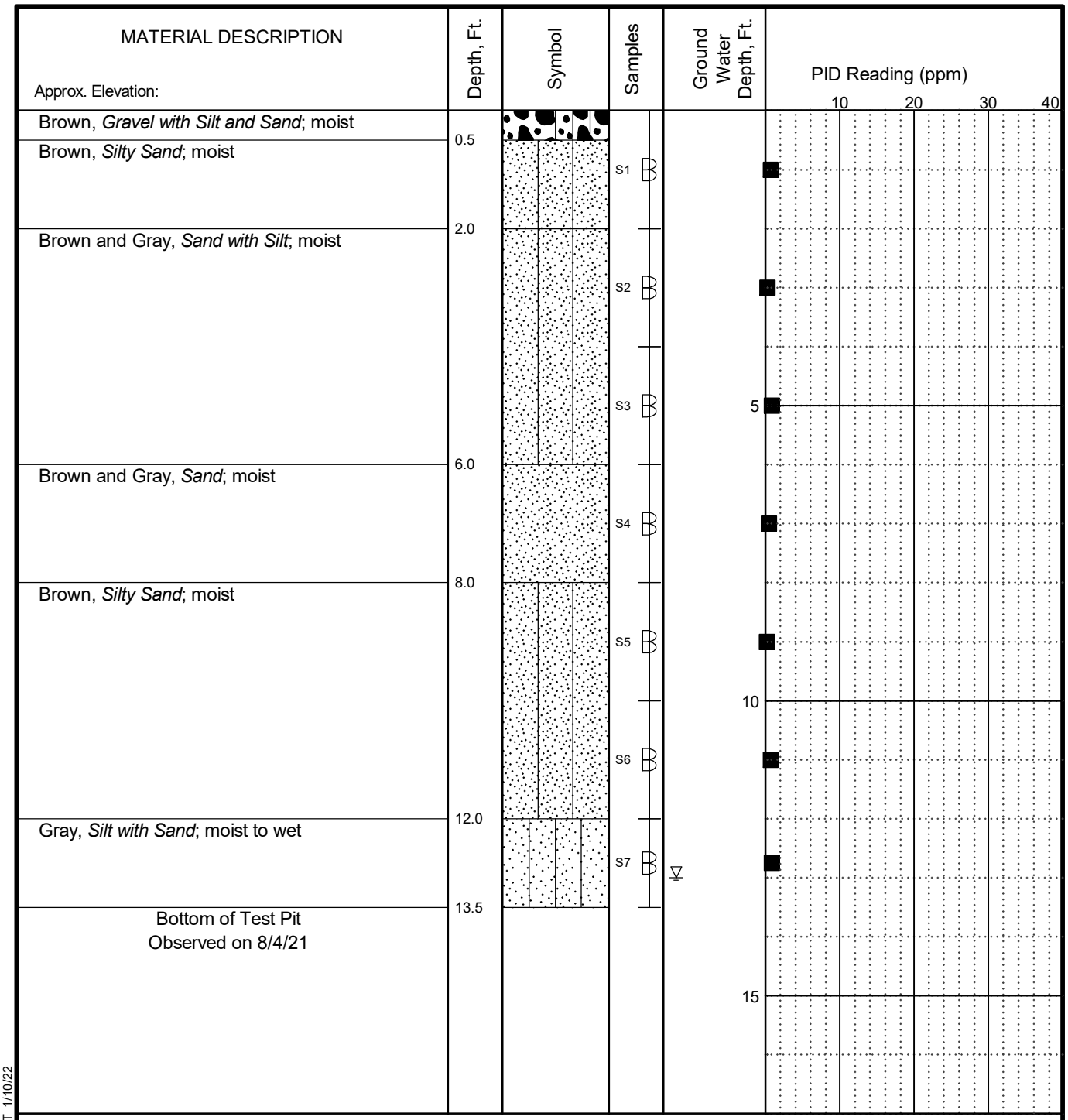
LOG OF TEST PIT TP5

February 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3-5

TEST PIT TEST PIT LOGS WITHOUT WELL.GPJ S&W GEO.GDT 1/10/22



LEGEND

▽ Ground Water Level At Time Of Excavation

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.

Holy Cross Oil Company Site
Holy Cross, Alaska

LOG OF TEST PIT TP6

February 2022 106942-001

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3-6

TEST PIT TEST PIT LOGS WITHOUT WELL.GPJ S&W GEO.GDT 1/10/22

Attachment 4

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

Laboratory Report of Analysis

To: Shannon & Wilson, Inc.
5430 Fairbanks St #3
Anchorage, AK 99518

Report Number: **1214960**

Client Project: **106942 Holy Cross Oil**

Dear Alex Geilich,

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 Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **Shannon & Wilson, Inc.**
SGS Project: **1214960**
Project Name/Site: **106942 Holy Cross Oil**
Project Contact: **Alex Geilich**

Refer to sample receipt form for information on sample condition.

106942-TP1-S6 (1214960001) PS

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

106942-TP1-S7 (1214960002) PS

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

106942-TP2-S4 (1214960003) PS

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

106942-TP2-S6 (1214960004) PS

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

106942-TP4-S5 (1214960007) PS

AK102/103 - Surrogate recovery for 5a Androstane and n-triacontane do not meet QC criteria due to sample dilution.

106942-TW-TP3 (1214960015) PS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. Sample was re-extracted past 14 day hold-time to confirm results. Re-analysis confirms original results. In-hold data is reported.

106942-TW-TP7 (1214960016) PS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. Sample was re-extracted past 14 day hold-time to confirm results. Re-analysis confirms original results. In-hold data is reported.

LCS for HBN 1824179 [VXX/37643 (1630376) LCS

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

LCSD for HBN 1824324 [VXX/3766 (1630979) LCSD

8260D - LCSD RPD for chloroethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

MB for HBN 1823898 [XXX/45363] (1629296) MB

8270D SIM - Phenanthrene is detect in the PAH method blank at greater than 1/2 the LOQ. There are no DOD samples reporting this analyte above the LOQ.

1214960003(1629618MSD) (1629620) MSD

8021B - MSD recoveries for several analytes do not meet QC criteria, please refer to LCS/LCSD for accuracy requirements.

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

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
SW8260D				
1214960015	106942-TW-TP3	VMS21053	4-Isopropyltoluene	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, indenmification and jurisdiction issues defined therein.

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
106942-TP1-S6	1214960001	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP1-S7	1214960002	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP2-S4	1214960003	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP2-S6	1214960004	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP3-S1	1214960005	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP3-S5	1214960006	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP4-S5	1214960007	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP4-S7	1214960008	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP5-S2	1214960009	08/04/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP5-S6	1214960010	08/04/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP6-S3	1214960011	08/04/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP6-S7	1214960012	08/04/2021	08/09/2021	Soil/Solid (dry weight)
106942-TP6-S8	1214960013	08/04/2021	08/09/2021	Soil/Solid (dry weight)
106942-TB-S1	1214960014	08/03/2021	08/09/2021	Soil/Solid (dry weight)
106942-TW-TP3	1214960015	08/04/2021	08/09/2021	Water (Surface, Eff., Ground)
106942-TW-TP7	1214960016	08/04/2021	08/09/2021	Water (Surface, Eff., Ground)
106942-TB-W1	1214960017	08/04/2021	08/09/2021	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
SW8021B	BTEX 8021 prepped by AK101 Field Prep
AK102	Diesel Range Organics (S)
AK102	DRO Low Volume (W)
AK101	Gasoline Range Organics (S)
AK101	Gasoline Range Organics (W)
SM21 2540G	Percent Solids SM2540G
SW8260D	VOC 8260 (S) Field Extracted
SW8260D	Volatile Organic Compounds (W) FULL

Detectable Results Summary

Client Sample ID: **106942-TP1-S6**
Lab Sample ID: 1214960001

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	181	ug/kg
	2-Methylnaphthalene	194	ug/kg
	Naphthalene	139	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	42.8	mg/kg
Volatile Fuels	Gasoline Range Organics	190	mg/kg
Volatile GC/MS	1,2,4-Trimethylbenzene	13500	ug/kg
	1,2-Dibromoethane	41.2	ug/kg
	1,3,5-Trimethylbenzene	3720	ug/kg
	4-Isopropyltoluene	825	ug/kg
	Benzene	3080	ug/kg
	Ethylbenzene	4550	ug/kg
	Isopropylbenzene (Cumene)	1180	ug/kg
	Naphthalene	358	ug/kg
	n-Propylbenzene	2080	ug/kg
	o-Xylene	16000	ug/kg
	P & M -Xylene	33400	ug/kg
	sec-Butylbenzene	361	ug/kg
	Toluene	23600	ug/kg
	Xylenes (total)	49300	ug/kg

Client Sample ID: **106942-TP1-S7**
Lab Sample ID: 1214960002

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	57.5	ug/kg
	2-Methylnaphthalene	69.5	ug/kg
	Naphthalene	110	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	138	mg/kg
Volatile Fuels	Gasoline Range Organics	917	mg/kg
Volatile GC/MS	1,2,4-Trimethylbenzene	25100	ug/kg
	1,3,5-Trimethylbenzene	10100	ug/kg
	4-Isopropyltoluene	2630J	ug/kg
	Benzene	33400	ug/kg
	Chloroform	109J	ug/kg
	Ethylbenzene	27400	ug/kg
	Isopropylbenzene (Cumene)	5440	ug/kg
	n-Propylbenzene	8290	ug/kg
	o-Xylene	52700	ug/kg
	P & M -Xylene	119000	ug/kg
	sec-Butylbenzene	1350J	ug/kg
	Toluene	173000	ug/kg
	Xylenes (total)	172000	ug/kg

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Detectable Results Summary

Client Sample ID: **106942-TP2-S4**
Lab Sample ID: 1214960003
Volatile Fuels

Parameter	Result	Units
Benzene	1920	ug/kg
Ethylbenzene	1170	ug/kg
Gasoline Range Organics	44.7	mg/kg
o-Xylene	2400	ug/kg
P & M -Xylene	6150	ug/kg
Toluene	6810	ug/kg
Xylenes (total)	8550	ug/kg

Client Sample ID: **106942-TP2-S6**
Lab Sample ID: 1214960004
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	132	mg/kg
Benzene	3050	ug/kg
Ethylbenzene	989	ug/kg
Gasoline Range Organics	39.7	mg/kg
o-Xylene	1810	ug/kg
P & M -Xylene	5280	ug/kg
Toluene	6630	ug/kg
Xylenes (total)	7080	ug/kg

Client Sample ID: **106942-TP3-S1**
Lab Sample ID: 1214960005
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	9.55J	mg/kg
Benzene	12.7J	ug/kg
Gasoline Range Organics	2.12J	mg/kg
o-Xylene	24.7J	ug/kg
P & M -Xylene	53.5J	ug/kg
Toluene	37.4J	ug/kg
Xylenes (total)	78.2J	ug/kg

Client Sample ID: **106942-TP4-S5**
Lab Sample ID: 1214960007
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	15500	mg/kg
Benzene	28.9	ug/kg
Gasoline Range Organics	2.11J	mg/kg
o-Xylene	42.1J	ug/kg
P & M -Xylene	73.5J	ug/kg
Toluene	36.0J	ug/kg
Xylenes (total)	116J	ug/kg

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Detectable Results Summary

Client Sample ID: **106942-TP4-S7**
Lab Sample ID: 1214960008
Volatile Fuels

Parameter	Result	Units
Benzene	1080	ug/kg
Ethylbenzene	847	ug/kg
Gasoline Range Organics	14.6	mg/kg
o-Xylene	1030	ug/kg
P & M -Xylene	2770	ug/kg
Toluene	58.0	ug/kg
Xylenes (total)	3800	ug/kg

Client Sample ID: **106942-TP5-S2**
Lab Sample ID: 1214960009
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	17.4J	mg/kg
Benzene	22.0J	ug/kg
Ethylbenzene	29.8J	ug/kg
Gasoline Range Organics	4.06J	mg/kg
o-Xylene	45.9	ug/kg
P & M -Xylene	88.6J	ug/kg
Toluene	53.2	ug/kg
Xylenes (total)	134J	ug/kg

Client Sample ID: **106942-TP5-S6**
Lab Sample ID: 1214960010
Volatile Fuels

Parameter	Result	Units
Benzene	8.73J	ug/kg
Gasoline Range Organics	1.22J	mg/kg

Client Sample ID: **106942-TP6-S3**
Lab Sample ID: 1214960011
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	8.52J	mg/kg

Client Sample ID: **106942-TP6-S7**
Lab Sample ID: 1214960012
Volatile Fuels

Parameter	Result	Units
Benzene	16.4	ug/kg
P & M -Xylene	21.7J	ug/kg

Client Sample ID: **106942-TP6-S8**
Lab Sample ID: 1214960013
Volatile Fuels

Parameter	Result	Units
Benzene	14.4J	ug/kg
P & M -Xylene	24.8J	ug/kg

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Detectable Results Summary

Client Sample ID: **106942-TW-TP3**
Lab Sample ID: 1214960015

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Phenanthrene	0.0283J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.892	mg/L
Volatile Fuels	Gasoline Range Organics	0.844	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	47.1	ug/L
	1,3,5-Trimethylbenzene	22.9	ug/L
	4-Isopropyltoluene	1.62	ug/L
	Benzene	147	ug/L
	Ethylbenzene	17.9	ug/L
	Isopropylbenzene (Cumene)	7.03	ug/L
	n-Propylbenzene	8.72	ug/L
	o-Xylene	21.9	ug/L
	P & M -Xylene	70.7	ug/L
	sec-Butylbenzene	2.43	ug/L
	tert-Butylbenzene	0.392J	ug/L
	Toluene	30.5	ug/L
	Xylenes (total)	92.6	ug/L

Client Sample ID: **106942-TW-TP7**
Lab Sample ID: 1214960016

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	2-Methylnaphthalene	0.0337J	ug/L
	Naphthalene	0.106J	ug/L
	Phenanthrene	0.0294J	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.848	mg/L
Volatile Fuels	Gasoline Range Organics	0.0501J	mg/L
Volatile GC/MS	1,2,4-Trimethylbenzene	62.7	ug/L
	1,3,5-Trimethylbenzene	31.2	ug/L
	4-Isopropyltoluene	9.64	ug/L
	Benzene	178	ug/L
	Ethylbenzene	22.3	ug/L
	Isopropylbenzene (Cumene)	9.95	ug/L
	Naphthalene	0.490J	ug/L
	n-Propylbenzene	11.8	ug/L
	o-Xylene	27.9	ug/L
	P & M -Xylene	93.8	ug/L
	sec-Butylbenzene	4.85	ug/L
	tert-Butylbenzene	0.561J	ug/L
	Toluene	33.7	ug/L
	Xylenes (total)	122	ug/L

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Results of **106942-TP1-S6**

Client Sample ID: **106942-TP1-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960001
Lab Project ID: 1214960

Collection Date: 08/03/21 12:50
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	181		29.8	7.44	ug/kg	1		08/17/21 04:49
2-Methylnaphthalene	194		29.8	7.44	ug/kg	1		08/17/21 04:49
Acenaphthene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Acenaphthylene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Anthracene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Benzo(a)Anthracene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Benzo[a]pyrene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Benzo[b]Fluoranthene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Benzo[g,h,i]perylene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Benzo[k]fluoranthene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Chrysene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Dibenzo[a,h]anthracene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Fluoranthene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Fluorene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Indeno[1,2,3-c,d] pyrene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Naphthalene	139		23.8	5.95	ug/kg	1		08/17/21 04:49
Phenanthrene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Pyrene	14.9 U		29.8	7.44	ug/kg	1		08/17/21 04:49
Surrogates								
2-Methylnaphthalene-d10 (surr)	87.1		58-103		%	1		08/17/21 04:49
Fluoranthene-d10 (surr)	83.5		54-113		%	1		08/17/21 04:49

Batch Information

Analytical Batch: XMS12835
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/17/21 04:49
Container ID: 1214960001-A

Prep Batch: XXX45370
Prep Method: SW3550C
Prep Date/Time: 08/12/21 12:54
Prep Initial Wt./Vol.: 22.512 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP1-S6**

Client Sample ID: **106942-TP1-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960001
Lab Project ID: 1214960

Collection Date: 08/03/21 12:50
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	42.8		23.8	7.37	mg/kg	1		08/11/21 22:56
Surrogates								
5a Androstane (surr)	87.7		50-150		%	1		08/11/21 22:56

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/11/21 22:56
Container ID: 1214960001-A

Prep Batch: XXX45346
Prep Method: SW3550C
Prep Date/Time: 08/10/21 07:32
Prep Initial Wt./Vol.: 30.053 g
Prep Extract Vol: 5 mL

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Results of **106942-TP1-S6**

Client Sample ID: **106942-TP1-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960001
Lab Project ID: 1214960

Collection Date: 08/03/21 12:50
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	190		43.0	12.9	mg/kg	10		08/13/21 16:10
Surrogates								
4-Bromofluorobenzene (surr)	358	*	50-150		%	10		08/13/21 16:10

Batch Information

Analytical Batch: VFC15766
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/13/21 16:10
Container ID: 1214960001-B

Prep Batch: VXX37647
Prep Method: SW5035A
Prep Date/Time: 08/03/21 12:50
Prep Initial Wt./Vol.: 44.587 g
Prep Extract Vol: 32.1548 mL

Results of **106942-TP1-S6**

Client Sample ID: **106942-TP1-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960001
Lab Project ID: 1214960

Collection Date: 08/03/21 12:50
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	17.2	U	34.4	10.7	ug/kg	1		08/13/21 20:38
1,1,1-Trichloroethane	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,1,2,2-Tetrachloroethane	1.72	U	3.44	1.07	ug/kg	1		08/13/21 20:38
1,1,2-Trichloroethane	0.685	U	1.37	0.430	ug/kg	1		08/13/21 20:38
1,1-Dichloroethane	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,1-Dichloroethene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,1-Dichloropropene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,2,3-Trichlorobenzene	43.0	U	85.9	25.8	ug/kg	1		08/13/21 20:38
1,2,3-Trichloropropane	1.72	U	3.44	1.07	ug/kg	1		08/13/21 20:38
1,2,4-Trichlorobenzene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,2,4-Trimethylbenzene	13500		3440	1030	ug/kg	20		08/16/21 16:00
1,2-Dibromo-3-chloropropane	86.0	U	172	53.3	ug/kg	1		08/13/21 20:38
1,2-Dibromoethane	41.2		1.72	0.687	ug/kg	1		08/13/21 20:38
1,2-Dichlorobenzene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,2-Dichloroethane	1.72	U	3.44	1.20	ug/kg	1		08/13/21 20:38
1,2-Dichloropropane	8.60	U	17.2	5.33	ug/kg	1		08/13/21 20:38
1,3,5-Trimethylbenzene	3720		43.0	13.4	ug/kg	1		08/13/21 20:38
1,3-Dichlorobenzene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
1,3-Dichloropropane	8.60	U	17.2	5.33	ug/kg	1		08/13/21 20:38
1,4-Dichlorobenzene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
2,2-Dichloropropane	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
2-Butanone (MEK)	215	U	430	134	ug/kg	1		08/13/21 20:38
2-Chlorotoluene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
2-Hexanone	86.0	U	172	53.3	ug/kg	1		08/13/21 20:38
4-Chlorotoluene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
4-Isopropyltoluene	825		172	43.0	ug/kg	1		08/13/21 20:38
4-Methyl-2-pentanone (MIBK)	215	U	430	134	ug/kg	1		08/13/21 20:38
Acetone	215	U	430	134	ug/kg	1		08/13/21 20:38
Benzene	3080		21.5	6.70	ug/kg	1		08/13/21 20:38
Bromobenzene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
Bromochloromethane	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
Bromodichloromethane	1.72	U	3.44	1.07	ug/kg	1		08/13/21 20:38
Bromoform	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38
Bromomethane	17.2	U	34.4	10.7	ug/kg	1		08/13/21 20:38
Carbon disulfide	86.0	U	172	53.3	ug/kg	1		08/13/21 20:38
Carbon tetrachloride	10.8	U	21.5	6.70	ug/kg	1		08/13/21 20:38
Chlorobenzene	21.5	U	43.0	13.4	ug/kg	1		08/13/21 20:38

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J flagging is activated

Results of **106942-TP1-S6**

Client Sample ID: **106942-TP1-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960001
Lab Project ID: 1214960

Collection Date: 08/03/21 12:50
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	172 U		344	107	ug/kg	1		08/13/21 20:38
Chloroform	3.44 U		6.87	1.72	ug/kg	1		08/13/21 20:38
Chloromethane	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
cis-1,2-Dichloroethene	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
cis-1,3-Dichloropropene	10.8 U		21.5	6.70	ug/kg	1		08/13/21 20:38
Dibromochloromethane	4.29 U		8.59	2.58	ug/kg	1		08/13/21 20:38
Dibromomethane	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
Dichlorodifluoromethane	43.0 U		85.9	25.8	ug/kg	1		08/13/21 20:38
Ethylbenzene	4550		859	268	ug/kg	20		08/16/21 16:00
Freon-113	86.0 U		172	53.3	ug/kg	1		08/13/21 20:38
Hexachlorobutadiene	17.2 U		34.4	10.7	ug/kg	1		08/13/21 20:38
Isopropylbenzene (Cumene)	1180		43.0	13.4	ug/kg	1		08/13/21 20:38
Methylene chloride	86.0 U		172	53.3	ug/kg	1		08/13/21 20:38
Methyl-t-butyl ether	86.0 U		172	53.3	ug/kg	1		08/13/21 20:38
Naphthalene	358		43.0	13.4	ug/kg	1		08/13/21 20:38
n-Butylbenzene	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
n-Propylbenzene	2080		43.0	13.4	ug/kg	1		08/13/21 20:38
o-Xylene	16000		859	268	ug/kg	20		08/16/21 16:00
P & M -Xylene	33400		1720	515	ug/kg	20		08/16/21 16:00
sec-Butylbenzene	361		43.0	13.4	ug/kg	1		08/13/21 20:38
Styrene	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
tert-Butylbenzene	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
Tetrachloroethene	10.8 U		21.5	6.70	ug/kg	1		08/13/21 20:38
Toluene	23600		859	268	ug/kg	20		08/16/21 16:00
trans-1,2-Dichloroethene	21.5 U		43.0	13.4	ug/kg	1		08/13/21 20:38
trans-1,3-Dichloropropene	10.8 U		21.5	6.70	ug/kg	1		08/13/21 20:38
Trichloroethene	4.29 U		8.59	2.58	ug/kg	1		08/13/21 20:38
Trichlorofluoromethane	43.0 U		85.9	25.8	ug/kg	1		08/13/21 20:38
Vinyl acetate	86.0 U		172	53.3	ug/kg	1		08/13/21 20:38
Vinyl chloride	0.685 U		1.37	0.430	ug/kg	1		08/13/21 20:38
Xylenes (total)	49300		2580	783	ug/kg	20		08/16/21 16:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	90.8		71-136		%	1		08/13/21 20:38
4-Bromofluorobenzene (surr)	104		55-151		%	1		08/13/21 20:38
Toluene-d8 (surr)	103		85-116		%	1		08/13/21 20:38

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Results of **106942-TP1-S6**

Client Sample ID: **106942-TP1-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960001
Lab Project ID: 1214960

Collection Date: 08/03/21 12:50
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):84.0
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21061
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/16/21 16:00
Container ID: 1214960001-B

Prep Batch: VXX37655
Prep Method: SW5035A
Prep Date/Time: 08/03/21 12:50
Prep Initial Wt./Vol.: 44.587 g
Prep Extract Vol: 32.1548 mL

Analytical Batch: VMS21055
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/13/21 20:38
Container ID: 1214960001-B

Prep Batch: VXX37643
Prep Method: SW5035A
Prep Date/Time: 08/03/21 12:50
Prep Initial Wt./Vol.: 44.587 g
Prep Extract Vol: 32.1548 mL

Results of **106942-TP1-S7**

Client Sample ID: **106942-TP1-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960002
Lab Project ID: 1214960

Collection Date: 08/03/21 13:00
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.6
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	57.5		34.4	8.59	ug/kg	1		08/17/21 05:10
2-Methylnaphthalene	69.5		34.4	8.59	ug/kg	1		08/17/21 05:10
Acenaphthene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Acenaphthylene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Anthracene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Benzo(a)Anthracene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Benzo[a]pyrene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Benzo[b]Fluoranthene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Benzo[g,h,i]perylene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Benzo[k]fluoranthene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Chrysene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Dibenzo[a,h]anthracene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Fluoranthene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Fluorene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Indeno[1,2,3-c,d] pyrene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Naphthalene	110		27.5	6.87	ug/kg	1		08/17/21 05:10
Phenanthrene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Pyrene	17.2 U		34.4	8.59	ug/kg	1		08/17/21 05:10
Surrogates								
2-Methylnaphthalene-d10 (surr)	79.1		58-103		%	1		08/17/21 05:10
Fluoranthene-d10 (surr)	74.3		54-113		%	1		08/17/21 05:10

Batch Information

Analytical Batch: XMS12835
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/17/21 05:10
Container ID: 1214960002-A

Prep Batch: XXX45370
Prep Method: SW3550C
Prep Date/Time: 08/12/21 12:54
Prep Initial Wt./Vol.: 22.56 g
Prep Extract Vol: 5 mL

Results of **106942-TP1-S7**

Client Sample ID: **106942-TP1-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960002
Lab Project ID: 1214960

Collection Date: 08/03/21 13:00
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	138		27.2	8.44	mg/kg	1		08/11/21 23:06
Surrogates								
5a Androstane (surr)	81.3		50-150		%	1		08/11/21 23:06

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/11/21 23:06
Container ID: 1214960002-A

Prep Batch: XXX45346
Prep Method: SW3550C
Prep Date/Time: 08/10/21 07:32
Prep Initial Wt./Vol.: 30.367 g
Prep Extract Vol: 5 mL

Results of **106942-TP1-S7**

Client Sample ID: **106942-TP1-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960002
Lab Project ID: 1214960

Collection Date: 08/03/21 13:00
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	917		43.5	13.1	mg/kg	10		08/11/21 16:45
Surrogates								
4-Bromofluorobenzene (surr)	1470	*	50-150		%	10		08/11/21 16:45

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 16:45
Container ID: 1214960002-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 13:00
Prep Initial Wt./Vol.: 69.991 g
Prep Extract Vol: 44.1987 mL

Results of **106942-TP1-S7**

Client Sample ID: **106942-TP1-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960002
Lab Project ID: 1214960

Collection Date: 08/03/21 13:00
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.6
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	870	U	1740	540	ug/kg	50		08/13/21 21:09
1,1,1-Trichloroethane	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,1,2,2-Tetrachloroethane	87.0	U	174	54.0	ug/kg	50		08/13/21 21:09
1,1,2-Trichloroethane	34.8	U	69.6	21.8	ug/kg	50		08/13/21 21:09
1,1-Dichloroethane	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,1-Dichloroethene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,1-Dichloropropene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,2,3-Trichlorobenzene	2175	U	4350	1310	ug/kg	50		08/13/21 21:09
1,2,3-Trichloropropane	87.0	U	174	54.0	ug/kg	50		08/13/21 21:09
1,2,4-Trichlorobenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,2,4-Trimethylbenzene	25100		4350	1310	ug/kg	50		08/13/21 21:09
1,2-Dibromo-3-chloropropane	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
1,2-Dibromoethane	43.5	U	87.0	34.8	ug/kg	50		08/13/21 21:09
1,2-Dichlorobenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,2-Dichloroethane	87.0	U	174	60.9	ug/kg	50		08/13/21 21:09
1,2-Dichloropropane	435	U	870	270	ug/kg	50		08/13/21 21:09
1,3,5-Trimethylbenzene	10100		2180	679	ug/kg	50		08/13/21 21:09
1,3-Dichlorobenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
1,3-Dichloropropane	435	U	870	270	ug/kg	50		08/13/21 21:09
1,4-Dichlorobenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
2,2-Dichloropropane	1090	U	2180	679	ug/kg	50		08/13/21 21:09
2-Butanone (MEK)	10900	U	21800	6790	ug/kg	50		08/13/21 21:09
2-Chlorotoluene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
2-Hexanone	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
4-Chlorotoluene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
4-Isopropyltoluene	2630	J	8700	2180	ug/kg	50		08/13/21 21:09
4-Methyl-2-pentanone (MIBK)	10900	U	21800	6790	ug/kg	50		08/13/21 21:09
Acetone	10900	U	21800	6790	ug/kg	50		08/13/21 21:09
Benzene	33400		1090	339	ug/kg	50		08/13/21 21:09
Bromobenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
Bromochloromethane	1090	U	2180	679	ug/kg	50		08/13/21 21:09
Bromodichloromethane	87.0	U	174	54.0	ug/kg	50		08/13/21 21:09
Bromoform	1090	U	2180	679	ug/kg	50		08/13/21 21:09
Bromomethane	870	U	1740	540	ug/kg	50		08/13/21 21:09
Carbon disulfide	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
Carbon tetrachloride	545	U	1090	339	ug/kg	50		08/13/21 21:09
Chlorobenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09

Results of **106942-TP1-S7**

Client Sample ID: **106942-TP1-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960002
Lab Project ID: 1214960

Collection Date: 08/03/21 13:00
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.6
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	8700	U	17400	5400	ug/kg	50		08/13/21 21:09
Chloroform	109	J	348	87.0	ug/kg	50		08/13/21 21:09
Chloromethane	1090	U	2180	679	ug/kg	50		08/13/21 21:09
cis-1,2-Dichloroethene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
cis-1,3-Dichloropropene	545	U	1090	339	ug/kg	50		08/13/21 21:09
Dibromochloromethane	218	U	435	131	ug/kg	50		08/13/21 21:09
Dibromomethane	1090	U	2180	679	ug/kg	50		08/13/21 21:09
Dichlorodifluoromethane	2175	U	4350	1310	ug/kg	50		08/13/21 21:09
Ethylbenzene	27400		2180	679	ug/kg	50		08/13/21 21:09
Freon-113	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
Hexachlorobutadiene	870	U	1740	540	ug/kg	50		08/13/21 21:09
Isopropylbenzene (Cumene)	5440		2180	679	ug/kg	50		08/13/21 21:09
Methylene chloride	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
Methyl-t-butyl ether	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
Naphthalene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
n-Butylbenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
n-Propylbenzene	8290		2180	679	ug/kg	50		08/13/21 21:09
o-Xylene	52700		2180	679	ug/kg	50		08/13/21 21:09
P & M -Xylene	119000		4350	1310	ug/kg	50		08/13/21 21:09
sec-Butylbenzene	1350	J	2180	679	ug/kg	50		08/13/21 21:09
Styrene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
tert-Butylbenzene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
Tetrachloroethene	545	U	1090	339	ug/kg	50		08/13/21 21:09
Toluene	173000		2180	679	ug/kg	50		08/13/21 21:09
trans-1,2-Dichloroethene	1090	U	2180	679	ug/kg	50		08/13/21 21:09
trans-1,3-Dichloropropene	545	U	1090	339	ug/kg	50		08/13/21 21:09
Trichloroethene	218	U	435	131	ug/kg	50		08/13/21 21:09
Trichlorofluoromethane	2175	U	4350	1310	ug/kg	50		08/13/21 21:09
Vinyl acetate	4350	U	8700	2700	ug/kg	50		08/13/21 21:09
Vinyl chloride	34.8	U	69.6	21.8	ug/kg	50		08/13/21 21:09
Xylenes (total)	172000		6530	1980	ug/kg	50		08/13/21 21:09
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.3		71-136		%	50		08/13/21 21:09
4-Bromofluorobenzene (surr)	101		55-151		%	50		08/13/21 21:09
Toluene-d8 (surr)	107		85-116		%	50		08/13/21 21:09

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J flagging is activated

Results of **106942-TP1-S7**

Client Sample ID: **106942-TP1-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960002
Lab Project ID: 1214960

Collection Date: 08/03/21 13:00
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.6
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21055
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/13/21 21:09
Container ID: 1214960002-B

Prep Batch: VXX37643
Prep Method: SW5035A
Prep Date/Time: 08/03/21 13:00
Prep Initial Wt./Vol.: 69.991 g
Prep Extract Vol: 44.1987 mL

Results of **106942-TP2-S4**

Client Sample ID: **106942-TP2-S4**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960003
Lab Project ID: 1214960

Collection Date: 08/03/21 11:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):77.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.7	U	25.4	7.87	mg/kg	1		08/11/21 23:16
Surrogates								
5a Androstane (surr)	85		50-150		%	1		08/11/21 23:16

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/11/21 23:16
Container ID: 1214960003-A

Prep Batch: XXX45346
Prep Method: SW3550C
Prep Date/Time: 08/10/21 07:32
Prep Initial Wt./Vol.: 30.335 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP2-S4**

Client Sample ID: **106942-TP2-S4**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960003
Lab Project ID: 1214960

Collection Date: 08/03/21 11:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):77.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	44.7		4.98	1.49	mg/kg	1		08/13/21 16:28
Surrogates								
4-Bromofluorobenzene (surr)	163	*	50-150		%	1		08/13/21 16:28

Batch Information

Analytical Batch: VFC15766
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/13/21 16:28
Container ID: 1214960003-B

Prep Batch: VXX37647
Prep Method: SW5035A
Prep Date/Time: 08/03/21 11:10
Prep Initial Wt./Vol.: 45.103 g
Prep Extract Vol: 34.965 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1920		24.9	7.96	ug/kg	1		08/13/21 16:28
Ethylbenzene	1170		49.8	17.9	ug/kg	1		08/13/21 16:28
o-Xylene	2400		49.8	18.1	ug/kg	1		08/13/21 16:28
P & M -Xylene	6150		99.5	29.9	ug/kg	1		08/13/21 16:28
Toluene	6810		49.8	15.5	ug/kg	1		08/13/21 16:28
Xylenes (total)	8550		149	49.8	ug/kg	1		08/13/21 16:28
Surrogates								
1,4-Difluorobenzene (surr)	84.8		72-119		%	1		08/13/21 16:28

Batch Information

Analytical Batch: VFC15766
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/13/21 16:28
Container ID: 1214960003-B

Prep Batch: VXX37647
Prep Method: SW5035A
Prep Date/Time: 08/03/21 11:10
Prep Initial Wt./Vol.: 45.103 g
Prep Extract Vol: 34.965 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP2-S6**

Client Sample ID: **106942-TP2-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960004
Lab Project ID: 1214960

Collection Date: 08/03/21 11:30
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):74.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	132		26.6	8.23	mg/kg	1		08/12/21 18:43
Surrogates								
5a Androstane (surr)	82.9		50-150		%	1		08/12/21 18:43

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 18:43
Container ID: 1214960004-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.159 g
Prep Extract Vol: 5 mL

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

Results of **106942-TP2-S6**

Client Sample ID: **106942-TP2-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960004
Lab Project ID: 1214960

Collection Date: 08/03/21 11:30
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):74.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	39.7		3.88	1.16	mg/kg	1		08/11/21 19:28
Surrogates								
4-Bromofluorobenzene (surr)	182	*	50-150		%	1		08/11/21 19:28

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 19:28
Container ID: 1214960004-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 11:30
Prep Initial Wt./Vol.: 75.578 g
Prep Extract Vol: 43.959 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	3050		19.4	6.21	ug/kg	1		08/11/21 19:28
Ethylbenzene	989		38.8	14.0	ug/kg	1		08/11/21 19:28
o-Xylene	1810		38.8	14.1	ug/kg	1		08/11/21 19:28
P & M -Xylene	5280		77.6	23.3	ug/kg	1		08/11/21 19:28
Toluene	6630		38.8	12.1	ug/kg	1		08/11/21 19:28
Xylenes (total)	7080		116	38.8	ug/kg	1		08/11/21 19:28
Surrogates								
1,4-Difluorobenzene (surr)	100		72-119		%	1		08/11/21 19:28

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 19:28
Container ID: 1214960004-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 11:30
Prep Initial Wt./Vol.: 75.578 g
Prep Extract Vol: 43.959 mL

Print Date: 09/09/2021 10:38:45AM

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Results of **106942-TP3-S1**

Client Sample ID: **106942-TP3-S1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960005
Lab Project ID: 1214960

Collection Date: 08/03/21 15:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):73.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	9.55	J	27.0	8.38	mg/kg	1		08/12/21 18:53
Surrogates								
5a Androstane (surr)	87.6		50-150		%	1		08/12/21 18:53

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 18:53
Container ID: 1214960005-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.056 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP3-S1**

Client Sample ID: **106942-TP3-S1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960005
Lab Project ID: 1214960

Collection Date: 08/03/21 15:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):73.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.12 J		6.68	2.01	mg/kg	1		08/11/21 19:46
Surrogates								
4-Bromofluorobenzene (surr)	83.2		50-150		%	1		08/11/21 19:46

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 19:46
Container ID: 1214960005-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 15:10
Prep Initial Wt./Vol.: 34.439 g
Prep Extract Vol: 34.0024 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	12.7 J		33.4	10.7	ug/kg	1		08/11/21 19:46
Ethylbenzene	33.4 U		66.8	24.1	ug/kg	1		08/11/21 19:46
o-Xylene	24.7 J		66.8	24.3	ug/kg	1		08/11/21 19:46
P & M -Xylene	53.5 J		134	40.1	ug/kg	1		08/11/21 19:46
Toluene	37.4 J		66.8	20.9	ug/kg	1		08/11/21 19:46
Xylenes (total)	78.2 J		201	66.8	ug/kg	1		08/11/21 19:46
Surrogates								
1,4-Difluorobenzene (surr)	88.7		72-119		%	1		08/11/21 19:46

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 19:46
Container ID: 1214960005-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 15:10
Prep Initial Wt./Vol.: 34.439 g
Prep Extract Vol: 34.0024 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP3-S5**

Client Sample ID: **106942-TP3-S5**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960006
Lab Project ID: 1214960

Collection Date: 08/03/21 15:40
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13.7	U	27.4	8.50	mg/kg	1		08/11/21 23:26
Surrogates								
5a Androstane (surr)	89.2		50-150		%	1		08/11/21 23:26

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/11/21 23:26
Container ID: 1214960006-A

Prep Batch: XXX45346
Prep Method: SW3550C
Prep Date/Time: 08/10/21 07:32
Prep Initial Wt./Vol.: 30.036 g
Prep Extract Vol: 5 mL

Results of **106942-TP3-S5**

Client Sample ID: **106942-TP3-S5**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960006
Lab Project ID: 1214960

Collection Date: 08/03/21 15:40
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.98	U	3.96	1.19	mg/kg	1		08/11/21 20:04
Surrogates								
4-Bromofluorobenzene (surr)	88.7		50-150		%	1		08/11/21 20:04

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 20:04
Container ID: 1214960006-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 15:40
Prep Initial Wt./Vol.: 81.919 g
Prep Extract Vol: 47.2224 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	9.90	U	19.8	6.33	ug/kg	1		08/11/21 20:04
Ethylbenzene	19.8	U	39.6	14.2	ug/kg	1		08/11/21 20:04
o-Xylene	19.8	U	39.6	14.4	ug/kg	1		08/11/21 20:04
P & M -Xylene	39.5	U	79.1	23.7	ug/kg	1		08/11/21 20:04
Toluene	19.8	U	39.6	12.3	ug/kg	1		08/11/21 20:04
Xylenes (total)	59.5	U	119	39.6	ug/kg	1		08/11/21 20:04
Surrogates								
1,4-Difluorobenzene (surr)	89.3		72-119		%	1		08/11/21 20:04

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 20:04
Container ID: 1214960006-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 15:40
Prep Initial Wt./Vol.: 81.919 g
Prep Extract Vol: 47.2224 mL

Results of **106942-TP4-S5**

Client Sample ID: **106942-TP4-S5**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960007
Lab Project ID: 1214960

Collection Date: 08/03/21 14:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):75.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	15500		525	163	mg/kg	20		08/12/21 01:24
Surrogates								
5a Androstane (surr)	0	*	50-150		%	20		08/12/21 01:24

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 01:24
Container ID: 1214960007-A

Prep Batch: XXX45346
Prep Method: SW3550C
Prep Date/Time: 08/10/21 07:32
Prep Initial Wt./Vol.: 30.126 g
Prep Extract Vol: 5 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP4-S5**

Client Sample ID: **106942-TP4-S5**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960007
Lab Project ID: 1214960

Collection Date: 08/03/21 14:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):75.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.11	J	5.07	1.52	mg/kg	1		08/11/21 20:58
Surrogates								
4-Bromofluorobenzene (surr)	88.6		50-150		%	1		08/11/21 20:58

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 20:58
Container ID: 1214960007-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 14:10
Prep Initial Wt./Vol.: 47.413 g
Prep Extract Vol: 36.4586 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	28.9		25.4	8.11	ug/kg	1		08/11/21 20:58
Ethylbenzene	25.4	U	50.7	18.3	ug/kg	1		08/11/21 20:58
o-Xylene	42.1	J	50.7	18.5	ug/kg	1		08/11/21 20:58
P & M -Xylene	73.5	J	101	30.4	ug/kg	1		08/11/21 20:58
Toluene	36.0	J	50.7	15.8	ug/kg	1		08/11/21 20:58
Xylenes (total)	116	J	152	50.7	ug/kg	1		08/11/21 20:58
Surrogates								
1,4-Difluorobenzene (surr)	89.3		72-119		%	1		08/11/21 20:58

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 20:58
Container ID: 1214960007-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 14:10
Prep Initial Wt./Vol.: 47.413 g
Prep Extract Vol: 36.4586 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP4-S7**

Client Sample ID: **106942-TP4-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960008
Lab Project ID: 1214960

Collection Date: 08/03/21 14:40
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13.7	U	27.3	8.46	mg/kg	1		08/12/21 19:03
Surrogates								
5a Androstane (surr)	87.1		50-150		%	1		08/12/21 19:03

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 19:03
Container ID: 1214960008-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.302 g
Prep Extract Vol: 5 mL

Results of **106942-TP4-S7**

Client Sample ID: **106942-TP4-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960008
Lab Project ID: 1214960

Collection Date: 08/03/21 14:40
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	14.6		3.71	1.11	mg/kg	1		08/11/21 21:16
Surrogates								
4-Bromofluorobenzene (surr)	150		50-150		%	1		08/11/21 21:16

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 21:16
Container ID: 1214960008-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 14:40
Prep Initial Wt./Vol.: 94.55 g
Prep Extract Vol: 50.9612 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	1080		18.6	5.94	ug/kg	1		08/11/21 21:16
Ethylbenzene	847		37.1	13.4	ug/kg	1		08/11/21 21:16
o-Xylene	1030		37.1	13.5	ug/kg	1		08/11/21 21:16
P & M -Xylene	2770		74.3	22.3	ug/kg	1		08/11/21 21:16
Toluene	58.0		37.1	11.6	ug/kg	1		08/11/21 21:16
Xylenes (total)	3800		111	37.1	ug/kg	1		08/11/21 21:16
Surrogates								
1,4-Difluorobenzene (surr)	84.3		72-119		%	1		08/11/21 21:16

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 21:16
Container ID: 1214960008-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 14:40
Prep Initial Wt./Vol.: 94.55 g
Prep Extract Vol: 50.9612 mL

Results of **106942-TP5-S2**

Client Sample ID: **106942-TP5-S2**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960009
Lab Project ID: 1214960

Collection Date: 08/04/21 08:45
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):74.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	17.4	J	26.5	8.23	mg/kg	1		08/12/21 19:12
Surrogates								
5a Androstane (surr)	94		50-150		%	1		08/12/21 19:12

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 19:12
Container ID: 1214960009-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.24 g
Prep Extract Vol: 5 mL

Results of **106942-TP5-S2**

Client Sample ID: **106942-TP5-S2**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960009
Lab Project ID: 1214960

Collection Date: 08/04/21 08:45
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):74.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	4.06	J	4.59	1.38	mg/kg	1		08/11/21 21:35
Surrogates								
4-Bromofluorobenzene (surr)	110		50-150		%	1		08/11/21 21:35

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 21:35
Container ID: 1214960009-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 08:45
Prep Initial Wt./Vol.: 57.653 g
Prep Extract Vol: 39.5521 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	22.0	J	22.9	7.34	ug/kg	1		08/11/21 21:35
Ethylbenzene	29.8	J	45.9	16.5	ug/kg	1		08/11/21 21:35
o-Xylene	45.9		45.9	16.7	ug/kg	1		08/11/21 21:35
P & M -Xylene	88.6	J	91.8	27.5	ug/kg	1		08/11/21 21:35
Toluene	53.2		45.9	14.3	ug/kg	1		08/11/21 21:35
Xylenes (total)	134	J	138	45.9	ug/kg	1		08/11/21 21:35
Surrogates								
1,4-Difluorobenzene (surr)	89.5		72-119		%	1		08/11/21 21:35

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 21:35
Container ID: 1214960009-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 08:45
Prep Initial Wt./Vol.: 57.653 g
Prep Extract Vol: 39.5521 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP5-S6**

Client Sample ID: **106942-TP5-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960010
Lab Project ID: 1214960

Collection Date: 08/04/21 09:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):75.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	13.2	U	26.4	8.18	mg/kg	1		08/12/21 19:22
Surrogates								
5a Androstane (surr)	91.4		50-150		%	1		08/12/21 19:22

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 19:22
Container ID: 1214960010-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.245 g
Prep Extract Vol: 5 mL

Results of **106942-TP5-S6**

Client Sample ID: **106942-TP5-S6**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960010
Lab Project ID: 1214960

Collection Date: 08/04/21 09:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):75.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.22	J	3.97	1.19	mg/kg	1		08/11/21 21:53
Surrogates								
4-Bromofluorobenzene (surr)	84.6		50-150		%	1		08/11/21 21:53

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 21:53
Container ID: 1214960010-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 09:10
Prep Initial Wt./Vol.: 71.779 g
Prep Extract Vol: 42.8315 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	8.73	J	19.8	6.35	ug/kg	1		08/11/21 21:53
Ethylbenzene	19.9	U	39.7	14.3	ug/kg	1		08/11/21 21:53
o-Xylene	19.9	U	39.7	14.4	ug/kg	1		08/11/21 21:53
P & M -Xylene	39.7	U	79.4	23.8	ug/kg	1		08/11/21 21:53
Toluene	19.9	U	39.7	12.4	ug/kg	1		08/11/21 21:53
Xylenes (total)	59.5	U	119	39.7	ug/kg	1		08/11/21 21:53
Surrogates								
1,4-Difluorobenzene (surr)	89.2		72-119		%	1		08/11/21 21:53

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 21:53
Container ID: 1214960010-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 09:10
Prep Initial Wt./Vol.: 71.779 g
Prep Extract Vol: 42.8315 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP6-S3**

Client Sample ID: **106942-TP6-S3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960011
Lab Project ID: 1214960

Collection Date: 08/04/21 10:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	8.52	J	27.2	8.45	mg/kg	1		08/12/21 19:32
Surrogates								
5a Androstane (surr)	82.5		50-150		%	1		08/12/21 19:32

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 19:32
Container ID: 1214960011-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.296 g
Prep Extract Vol: 5 mL

Results of **106942-TP6-S3**

Client Sample ID: **106942-TP6-S3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960011
Lab Project ID: 1214960

Collection Date: 08/04/21 10:10
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):72.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.19	U	4.39	1.32	mg/kg	1		08/11/21 22:11
Surrogates								
4-Bromofluorobenzene (surr)	74.9		50-150		%	1		08/11/21 22:11

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 22:11
Container ID: 1214960011-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 10:10
Prep Initial Wt./Vol.: 68.514 g
Prep Extract Vol: 43.7085 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	10.9	U	21.9	7.02	ug/kg	1		08/11/21 22:11
Ethylbenzene	21.9	U	43.9	15.8	ug/kg	1		08/11/21 22:11
o-Xylene	21.9	U	43.9	16.0	ug/kg	1		08/11/21 22:11
P & M -Xylene	43.9	U	87.8	26.3	ug/kg	1		08/11/21 22:11
Toluene	21.9	U	43.9	13.7	ug/kg	1		08/11/21 22:11
Xylenes (total)	66.0	U	132	43.9	ug/kg	1		08/11/21 22:11
Surrogates								
1,4-Difluorobenzene (surr)	88.6		72-119		%	1		08/11/21 22:11

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 22:11
Container ID: 1214960011-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 10:10
Prep Initial Wt./Vol.: 68.514 g
Prep Extract Vol: 43.7085 mL

Results of **106942-TP6-S7**

Client Sample ID: **106942-TP6-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960012
Lab Project ID: 1214960

Collection Date: 08/04/21 10:25
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):78.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.8	U	25.5	7.92	mg/kg	1		08/12/21 20:02
Surrogates								
5a Androstane (surr)	84		50-150		%	1		08/12/21 20:02

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 20:02
Container ID: 1214960012-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.08 g
Prep Extract Vol: 5 mL

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

Results of **106942-TP6-S7**

Client Sample ID: **106942-TP6-S7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960012
Lab Project ID: 1214960

Collection Date: 08/04/21 10:25
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):78.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.65	U	3.29	0.986	mg/kg	1		08/11/21 22:29
Surrogates								
4-Bromofluorobenzene (surr)	81.9		50-150		%	1		08/11/21 22:29

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 22:29
Container ID: 1214960012-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 10:25
Prep Initial Wt./Vol.: 84.926 g
Prep Extract Vol: 43.5972 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	16.4		16.4	5.26	ug/kg	1		08/11/21 22:29
Ethylbenzene	16.4	U	32.9	11.8	ug/kg	1		08/11/21 22:29
o-Xylene	16.4	U	32.9	12.0	ug/kg	1		08/11/21 22:29
P & M -Xylene	21.7	J	65.7	19.7	ug/kg	1		08/11/21 22:29
Toluene	16.4	U	32.9	10.3	ug/kg	1		08/11/21 22:29
Xylenes (total)	49.3	U	98.6	32.9	ug/kg	1		08/11/21 22:29
Surrogates								
1,4-Difluorobenzene (surr)	88.8		72-119		%	1		08/11/21 22:29

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 22:29
Container ID: 1214960012-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 10:25
Prep Initial Wt./Vol.: 84.926 g
Prep Extract Vol: 43.5972 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TP6-S8**

Client Sample ID: **106942-TP6-S8**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960013
Lab Project ID: 1214960

Collection Date: 08/04/21 10:40
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.6	U	25.1	7.79	mg/kg	1		08/12/21 20:11
Surrogates								
5a Androstane (surr)	86.9		50-150		%	1		08/12/21 20:11

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/12/21 20:11
Container ID: 1214960013-A

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 08/11/21 08:46
Prep Initial Wt./Vol.: 30.303 g
Prep Extract Vol: 5 mL

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

Results of **106942-TP6-S8**

Client Sample ID: **106942-TP6-S8**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960013
Lab Project ID: 1214960

Collection Date: 08/04/21 10:40
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.53	U	3.06	0.919	mg/kg	1		08/11/21 22:47
Surrogates								
4-Bromofluorobenzene (surr)	93		50-150		%	1		08/11/21 22:47

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 22:47
Container ID: 1214960013-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 10:40
Prep Initial Wt./Vol.: 92.379 g
Prep Extract Vol: 44.6074 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	14.4	J	15.3	4.90	ug/kg	1		08/11/21 22:47
Ethylbenzene	15.3	U	30.6	11.0	ug/kg	1		08/11/21 22:47
o-Xylene	15.3	U	30.6	11.2	ug/kg	1		08/11/21 22:47
P & M -Xylene	24.8	J	61.3	18.4	ug/kg	1		08/11/21 22:47
Toluene	15.3	U	30.6	9.56	ug/kg	1		08/11/21 22:47
Xylenes (total)	46.0	U	91.9	30.6	ug/kg	1		08/11/21 22:47
Surrogates								
1,4-Difluorobenzene (surr)	87.9		72-119		%	1		08/11/21 22:47

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Analyst: MDT
Analytical Date/Time: 08/11/21 22:47
Container ID: 1214960013-B

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/04/21 10:40
Prep Initial Wt./Vol.: 92.379 g
Prep Extract Vol: 44.6074 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TB-S1**

Client Sample ID: **106942-TB-S1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960014
Lab Project ID: 1214960

Collection Date: 08/03/21 17:15
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.25	U	2.50	0.751	mg/kg	1		08/11/21 16:09
Surrogates								
4-Bromofluorobenzene (surr)	86.2		50-150		%	1		08/11/21 16:09

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/11/21 16:09
Container ID: 1214960014-A

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 08/03/21 17:15
Prep Initial Wt./Vol.: 49.935 g
Prep Extract Vol: 25 mL

Results of **106942-TB-S1**

Client Sample ID: **106942-TB-S1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960014
Lab Project ID: 1214960

Collection Date: 08/03/21 17:15
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	10.0	U	20.0	6.21	ug/kg	1		08/13/21 15:44
1,1,1-Trichloroethane	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,1,2,2-Tetrachloroethane	1.00	U	2.00	0.621	ug/kg	1		08/13/21 15:44
1,1,2-Trichloroethane	0.401	U	0.801	0.250	ug/kg	1		08/13/21 15:44
1,1-Dichloroethane	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,1-Dichloroethene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,1-Dichloropropene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,2,3-Trichlorobenzene	25.1	U	50.1	15.0	ug/kg	1		08/13/21 15:44
1,2,3-Trichloropropane	1.00	U	2.00	0.621	ug/kg	1		08/13/21 15:44
1,2,4-Trichlorobenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,2,4-Trimethylbenzene	25.1	U	50.1	15.0	ug/kg	1		08/13/21 15:44
1,2-Dibromo-3-chloropropane	50.0	U	100	31.0	ug/kg	1		08/13/21 15:44
1,2-Dibromoethane	0.500	U	1.00	0.401	ug/kg	1		08/13/21 15:44
1,2-Dichlorobenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,2-Dichloroethane	1.00	U	2.00	0.701	ug/kg	1		08/13/21 15:44
1,2-Dichloropropane	5.00	U	10.0	3.10	ug/kg	1		08/13/21 15:44
1,3,5-Trimethylbenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,3-Dichlorobenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
1,3-Dichloropropane	5.00	U	10.0	3.10	ug/kg	1		08/13/21 15:44
1,4-Dichlorobenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
2,2-Dichloropropane	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
2-Butanone (MEK)	125	U	250	78.1	ug/kg	1		08/13/21 15:44
2-Chlorotoluene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
2-Hexanone	50.0	U	100	31.0	ug/kg	1		08/13/21 15:44
4-Chlorotoluene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
4-Isopropyltoluene	50.0	U	100	25.0	ug/kg	1		08/13/21 15:44
4-Methyl-2-pentanone (MIBK)	125	U	250	78.1	ug/kg	1		08/13/21 15:44
Acetone	125	U	250	78.1	ug/kg	1		08/13/21 15:44
Benzene	6.25	U	12.5	3.91	ug/kg	1		08/13/21 15:44
Bromobenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
Bromochloromethane	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
Bromodichloromethane	1.00	U	2.00	0.621	ug/kg	1		08/13/21 15:44
Bromoform	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44
Bromomethane	10.0	U	20.0	6.21	ug/kg	1		08/13/21 15:44
Carbon disulfide	50.0	U	100	31.0	ug/kg	1		08/13/21 15:44
Carbon tetrachloride	6.25	U	12.5	3.91	ug/kg	1		08/13/21 15:44
Chlorobenzene	12.5	U	25.0	7.81	ug/kg	1		08/13/21 15:44

Results of **106942-TB-S1**

Client Sample ID: **106942-TB-S1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960014
Lab Project ID: 1214960

Collection Date: 08/03/21 17:15
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroethane	100 U		200	62.1	ug/kg	1		08/13/21 15:44
Chloroform	2.00 U		4.01	1.00	ug/kg	1		08/13/21 15:44
Chloromethane	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
cis-1,2-Dichloroethene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
cis-1,3-Dichloropropene	6.25 U		12.5	3.91	ug/kg	1		08/13/21 15:44
Dibromochloromethane	2.50 U		5.01	1.50	ug/kg	1		08/13/21 15:44
Dibromomethane	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
Dichlorodifluoromethane	25.1 U		50.1	15.0	ug/kg	1		08/13/21 15:44
Ethylbenzene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
Freon-113	50.0 U		100	31.0	ug/kg	1		08/13/21 15:44
Hexachlorobutadiene	10.0 U		20.0	6.21	ug/kg	1		08/13/21 15:44
Isopropylbenzene (Cumene)	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
Methylene chloride	50.0 U		100	31.0	ug/kg	1		08/13/21 15:44
Methyl-t-butyl ether	50.0 U		100	31.0	ug/kg	1		08/13/21 15:44
Naphthalene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
n-Butylbenzene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
n-Propylbenzene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
o-Xylene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
P & M -Xylene	25.1 U		50.1	15.0	ug/kg	1		08/13/21 15:44
sec-Butylbenzene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
Styrene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
tert-Butylbenzene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
Tetrachloroethene	6.25 U		12.5	3.91	ug/kg	1		08/13/21 15:44
Toluene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
trans-1,2-Dichloroethene	12.5 U		25.0	7.81	ug/kg	1		08/13/21 15:44
trans-1,3-Dichloropropene	6.25 U		12.5	3.91	ug/kg	1		08/13/21 15:44
Trichloroethene	2.50 U		5.01	1.50	ug/kg	1		08/13/21 15:44
Trichlorofluoromethane	25.1 U		50.1	15.0	ug/kg	1		08/13/21 15:44
Vinyl acetate	50.0 U		100	31.0	ug/kg	1		08/13/21 15:44
Vinyl chloride	0.401 U		0.801	0.250	ug/kg	1		08/13/21 15:44
Xylenes (total)	37.5 U		75.1	22.8	ug/kg	1		08/13/21 15:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	89.6		71-136		%	1		08/13/21 15:44
4-Bromofluorobenzene (surr)	102		55-151		%	1		08/13/21 15:44
Toluene-d8 (surr)	104		85-116		%	1		08/13/21 15:44

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TB-S1**

Client Sample ID: **106942-TB-S1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960014
Lab Project ID: 1214960

Collection Date: 08/03/21 17:15
Received Date: 08/09/21 11:33
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21055
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/13/21 15:44
Container ID: 1214960014-A

Prep Batch: VXX37643
Prep Method: SW5035A
Prep Date/Time: 08/03/21 17:15
Prep Initial Wt./Vol.: 49.935 g
Prep Extract Vol: 25 mL

Results of **106942-TW-TP3**

Client Sample ID: **106942-TW-TP3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960015
Lab Project ID: 1214960

Collection Date: 08/04/21 13:05
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
2-Methylnaphthalene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Acenaphthene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Acenaphthylene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Anthracene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Benzo(a)Anthracene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Benzo[a]pyrene	0.0102	U	0.0204	0.00633	ug/L	1		08/17/21 07:18
Benzo[b]Fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Benzo[g,h,i]perylene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Benzo[k]fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Chrysene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Dibenzo[a,h]anthracene	0.0102	U	0.0204	0.00633	ug/L	1		08/17/21 07:18
Fluoranthene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Fluorene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Indeno[1,2,3-c,d] pyrene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Naphthalene	0.0510	U	0.102	0.0316	ug/L	1		08/17/21 07:18
Phenanthrene	0.0283	J	0.0510	0.0153	ug/L	1		08/17/21 07:18
Pyrene	0.0255	U	0.0510	0.0153	ug/L	1		08/17/21 07:18
Surrogates								
2-Methylnaphthalene-d10 (surr)	49		42-86		%	1		08/17/21 07:18
Fluoranthene-d10 (surr)	47.5	*	50-97		%	1		08/17/21 07:18

Batch Information

Analytical Batch: XMS12841
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 08/17/21 07:18
Container ID: 1214960015-C

Prep Batch: XXX45363
Prep Method: SW3535A
Prep Date/Time: 08/11/21 11:30
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TW-TP3**

Client Sample ID: **106942-TW-TP3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960015
Lab Project ID: 1214960

Collection Date: 08/04/21 13:05
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.892		0.588	0.176	mg/L	1		08/11/21 19:50
Surrogates								
5a Androstane (surr)	85.5		50-150		%	1		08/11/21 19:50

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/11/21 19:50
Container ID: 1214960015-A

Prep Batch: XXX45355
Prep Method: SW3520C
Prep Date/Time: 08/10/21 17:06
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Results of **106942-TW-TP3**

Client Sample ID: **106942-TW-TP3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960015
Lab Project ID: 1214960

Collection Date: 08/04/21 13:05
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.844		0.100	0.0450	mg/L	1		08/13/21 09:31
Surrogates								
4-Bromofluorobenzene (surr)	146		50-150		%	1		08/13/21 09:31

Batch Information

Analytical Batch: VFC15765
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/13/21 09:31
Container ID: 1214960015-E

Prep Batch: VXX37645
Prep Method: SW5030B
Prep Date/Time: 08/12/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **106942-TW-TP3**

Client Sample ID: **106942-TW-TP3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960015
Lab Project ID: 1214960

Collection Date: 08/04/21 13:05
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		08/13/21 19:11
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,2,4-Trimethylbenzene	47.1		1.00	0.310	ug/L	1		08/13/21 19:11
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		08/13/21 19:11
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,3,5-Trimethylbenzene	22.9		1.00	0.310	ug/L	1		08/13/21 19:11
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
4-Isopropyltoluene	1.62		1.00	0.310	ug/L	1		08/13/21 19:11
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
Benzene	147		0.400	0.120	ug/L	1		08/13/21 19:11
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
Bromoform	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Bromomethane	2.50	U	5.00	2.00	ug/L	1		08/13/21 19:11
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
Chloroethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11

Results of **106942-TW-TP3**

Client Sample ID: **106942-TW-TP3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960015
Lab Project ID: 1214960

Collection Date: 08/04/21 13:05
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Chloromethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 19:11
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Ethylbenzene	17.9		1.00	0.310	ug/L	1		08/13/21 19:11
Freon-113	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Isopropylbenzene (Cumene)	7.03		1.00	0.310	ug/L	1		08/13/21 19:11
Methylene chloride	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
Naphthalene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
n-Propylbenzene	8.72		1.00	0.310	ug/L	1		08/13/21 19:11
o-Xylene	21.9		1.00	0.310	ug/L	1		08/13/21 19:11
P & M -Xylene	70.7		2.00	0.620	ug/L	1		08/13/21 19:11
sec-Butylbenzene	2.43		1.00	0.310	ug/L	1		08/13/21 19:11
Styrene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
tert-Butylbenzene	0.392	J	1.00	0.310	ug/L	1		08/13/21 19:11
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Toluene	30.5		1.00	0.310	ug/L	1		08/13/21 19:11
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 19:11
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		08/13/21 19:11
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		08/13/21 19:11
Xylenes (total)	92.6		3.00	1.00	ug/L	1		08/13/21 19:11
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		08/13/21 19:11
4-Bromofluorobenzene (surr)	106		85-114		%	1		08/13/21 19:11
Toluene-d8 (surr)	99		89-112		%	1		08/13/21 19:11

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TW-TP3**

Client Sample ID: **106942-TW-TP3**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960015
Lab Project ID: 1214960

Collection Date: 08/04/21 13:05
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21053
Analytical Method: SW8260D
Analyst: JMG
Analytical Date/Time: 08/13/21 19:11
Container ID: 1214960015-H

Prep Batch: VXX37641
Prep Method: SW5030B
Prep Date/Time: 08/13/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **106942-TW-TP7**

Client Sample ID: **106942-TW-TP7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960016
Lab Project ID: 1214960

Collection Date: 08/04/21 13:45
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
2-Methylnaphthalene	0.0337	J	0.0543	0.0163	ug/L	1		08/17/21 07:39
Acenaphthene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Acenaphthylene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Anthracene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Benzo(a)Anthracene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Benzo[a]pyrene	0.0109	U	0.0217	0.00674	ug/L	1		08/17/21 07:39
Benzo[b]Fluoranthene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Benzo[g,h,i]perylene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Benzo[k]fluoranthene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Chrysene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Dibenzo[a,h]anthracene	0.0109	U	0.0217	0.00674	ug/L	1		08/17/21 07:39
Fluoranthene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Fluorene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Indeno[1,2,3-c,d] pyrene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Naphthalene	0.106	J	0.109	0.0337	ug/L	1		08/17/21 07:39
Phenanthrene	0.0294	J	0.0543	0.0163	ug/L	1		08/17/21 07:39
Pyrene	0.0272	U	0.0543	0.0163	ug/L	1		08/17/21 07:39
Surrogates								
2-Methylnaphthalene-d10 (surr)	57.8		42-86		%	1		08/17/21 07:39
Fluoranthene-d10 (surr)	43	*	50-97		%	1		08/17/21 07:39

Batch Information

Analytical Batch: XMS12841
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 08/17/21 07:39
Container ID: 1214960016-C

Prep Batch: XXX45363
Prep Method: SW3535A
Prep Date/Time: 08/11/21 11:30
Prep Initial Wt./Vol.: 230 mL
Prep Extract Vol: 1 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TW-TP7**

Client Sample ID: **106942-TW-TP7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960016
Lab Project ID: 1214960

Collection Date: 08/04/21 13:45
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.848		0.625	0.188	mg/L	1		08/11/21 20:00
Surrogates								
5a Androstane (surr)	85.5		50-150		%	1		08/11/21 20:00

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/11/21 20:00
Container ID: 1214960016-A

Prep Batch: XXX45355
Prep Method: SW3520C
Prep Date/Time: 08/10/21 17:06
Prep Initial Wt./Vol.: 240 mL
Prep Extract Vol: 1 mL

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Results of **106942-TW-TP7**

Client Sample ID: **106942-TW-TP7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960016
Lab Project ID: 1214960

Collection Date: 08/04/21 13:45
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0501	J	0.100	0.0450	mg/L	1		08/13/21 09:49
Surrogates								
4-Bromofluorobenzene (surr)	93.8		50-150		%	1		08/13/21 09:49

Batch Information

Analytical Batch: VFC15765
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/13/21 09:49
Container ID: 1214960016-E

Prep Batch: VXX37645
Prep Method: SW5030B
Prep Date/Time: 08/12/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TW-TP7**

Client Sample ID: **106942-TW-TP7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960016
Lab Project ID: 1214960

Collection Date: 08/04/21 13:45
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		08/17/21 17:59
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,2,4-Trimethylbenzene	62.7		1.00	0.310	ug/L	1		08/17/21 17:59
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		08/17/21 17:59
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,2-Dichloroethane	0.250	U	0.500	0.200	ug/L	1		08/17/21 17:59
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,3,5-Trimethylbenzene	31.2		1.00	0.310	ug/L	1		08/17/21 17:59
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
4-Isopropyltoluene	9.64		1.00	0.310	ug/L	1		08/17/21 17:59
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
Benzene	178		0.400	0.120	ug/L	1		08/17/21 17:59
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
Bromoform	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Bromomethane	3.00	U	6.00	3.00	ug/L	1		08/17/21 17:59
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
Chloroethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TW-TP7**

Client Sample ID: **106942-TW-TP7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960016
Lab Project ID: 1214960

Collection Date: 08/04/21 13:45
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Chloromethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		08/17/21 17:59
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Ethylbenzene	22.3		1.00	0.310	ug/L	1		08/17/21 17:59
Freon-113	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Isopropylbenzene (Cumene)	9.95		1.00	0.310	ug/L	1		08/17/21 17:59
Methylene chloride	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
Naphthalene	0.490	J	1.00	0.310	ug/L	1		08/17/21 17:59
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
n-Propylbenzene	11.8		1.00	0.310	ug/L	1		08/17/21 17:59
o-Xylene	27.9		1.00	0.310	ug/L	1		08/17/21 17:59
P & M -Xylene	93.8		2.00	0.620	ug/L	1		08/17/21 17:59
sec-Butylbenzene	4.85		1.00	0.310	ug/L	1		08/17/21 17:59
Styrene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
tert-Butylbenzene	0.561	J	1.00	0.310	ug/L	1		08/17/21 17:59
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Toluene	33.7		1.00	0.310	ug/L	1		08/17/21 17:59
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		08/17/21 17:59
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		08/17/21 17:59
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		08/17/21 17:59
Xylenes (total)	122		3.00	1.00	ug/L	1		08/17/21 17:59
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		81-118		%	1		08/17/21 17:59
4-Bromofluorobenzene (surr)	100		85-114		%	1		08/17/21 17:59
Toluene-d8 (surr)	100		89-112		%	1		08/17/21 17:59

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TW-TP7**

Client Sample ID: **106942-TW-TP7**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960016
Lab Project ID: 1214960

Collection Date: 08/04/21 13:45
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21070
Analytical Method: SW8260D
Analyst: JMG
Analytical Date/Time: 08/17/21 17:59
Container ID: 1214960016-H

Prep Batch: VXX37668
Prep Method: SW5030B
Prep Date/Time: 08/17/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **106942-TB-W1**

Client Sample ID: **106942-TB-W1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960017
Lab Project ID: 1214960

Collection Date: 08/04/21 14:00
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0450	mg/L	1		08/13/21 00:52
Surrogates								
4-Bromofluorobenzene (surr)	87.3		50-150		%	1		08/13/21 00:52

Batch Information

Analytical Batch: VFC15765
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/13/21 00:52
Container ID: 1214960017-A

Prep Batch: VXX37644
Prep Method: SW5030B
Prep Date/Time: 08/12/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of **106942-TB-W1**

Client Sample ID: **106942-TB-W1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960017
Lab Project ID: 1214960

Collection Date: 08/04/21 14:00
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		08/13/21 14:14
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		08/13/21 14:14
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		08/13/21 14:14
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		08/13/21 14:14
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		08/13/21 14:14
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		08/13/21 14:14
Benzene	0.200	U	0.400	0.120	ug/L	1		08/13/21 14:14
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
Bromodichloromethane	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
Bromoform	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
Bromomethane	2.50	U	5.00	2.00	ug/L	1		08/13/21 14:14
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		08/13/21 14:14
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		08/13/21 14:14
Chloroethane	0.500	U	1.00	0.310	ug/L	1		08/13/21 14:14

Results of **106942-TB-W1**

Client Sample ID: **106942-TB-W1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960017
Lab Project ID: 1214960

Collection Date: 08/04/21 14:00
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Chloromethane	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		08/13/21 14:14
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		08/13/21 14:14
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Freon-113	5.00 U		10.0	3.10	ug/L	1		08/13/21 14:14
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Methylene chloride	5.00 U		10.0	3.10	ug/L	1		08/13/21 14:14
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		08/13/21 14:14
Naphthalene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
o-Xylene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		08/13/21 14:14
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Styrene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Toluene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		08/13/21 14:14
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		08/13/21 14:14
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		08/13/21 14:14
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		08/13/21 14:14
Surrogates								
1,2-Dichloroethane-D4 (surr)	103		81-118		%	1		08/13/21 14:14
4-Bromofluorobenzene (surr)	106		85-114		%	1		08/13/21 14:14
Toluene-d8 (surr)	101		89-112		%	1		08/13/21 14:14

Print Date: 09/09/2021 10:38:45AM

J flagging is activated

Results of **106942-TB-W1**

Client Sample ID: **106942-TB-W1**
Client Project ID: **106942 Holy Cross Oil**
Lab Sample ID: 1214960017
Lab Project ID: 1214960

Collection Date: 08/04/21 14:00
Received Date: 08/09/21 11:33
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS21053
Analytical Method: SW8260D
Analyst: JMG
Analytical Date/Time: 08/13/21 14:14
Container ID: 1214960017-D

Prep Batch: VXX37641
Prep Method: SW5030B
Prep Date/Time: 08/13/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1823822 [SPT/11344]
Blank Lab ID: 1629014

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960002, 1214960003, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11344
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM
Analytical Date/Time: 8/9/2021 3:40:00PM

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t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Duplicate Sample Summary

Original Sample ID: 1214938004
Duplicate Sample ID: 1629025
QC for Samples:

Analysis Date: 08/09/2021 15:40
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	98.1	98.2	%	0.08	(< 15)

Batch Information

Analytical Batch: SPT11344
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

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Duplicate Sample Summary

Original Sample ID: 1214938007
Duplicate Sample ID: 1629026

Analysis Date: 08/09/2021 15:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

1214960001, 1214960002, 1214960003, 1214960004, 1214960005, 1214960006

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	92.8	92.6	%	0.26	(< 15)

Batch Information

Analytical Batch: SPT11344
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 09/09/2021 10:38:50AM

Duplicate Sample Summary

Original Sample ID: 1214960006
Duplicate Sample ID: 1629027

Analysis Date: 08/09/2021 15:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

1214960001, 1214960002, 1214960003, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	72.9	72.9	%	0.02	(< 15)

Batch Information

Analytical Batch: SPT11344
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 09/09/2021 10:38:50AM

Method Blank

Blank ID: MB for HBN 1823981 [VXX/37628]
Blank Lab ID: 1629609

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/kg
Ethylbenzene	0.0125U	0.0250	0.00900	mg/kg
Gasoline Range Organics	1.25U	2.50	0.750	mg/kg
o-Xylene	0.0125U	0.0250	0.00910	mg/kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/kg
Toluene	0.0125U	0.0250	0.00780	mg/kg
Xylenes (total)	0.0375U	0.0750	0.0250	mg/kg
Surrogates				
1,4-Difluorobenzene (surr)	88.4	72-119		%
4-Bromofluorobenzene (surr)	74	50-150		%

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/11/2021 3:33:00PM

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 8/11/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37628]
Blank Spike Lab ID: 1629610
Date Analyzed: 08/11/2021 14:20

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37628]
Spike Duplicate Lab ID: 1629611
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.40	112	1.25	1.36	109	(75-125)	2.60	(< 20)
Ethylbenzene	1.25	1.31	105	1.25	1.26	101	(75-125)	4.00	(< 20)
o-Xylene	1.25	1.22	98	1.25	1.18	94	(75-125)	3.80	(< 20)
P & M -Xylene	2.50	2.58	103	2.50	2.48	99	(80-125)	4.30	(< 20)
Toluene	1.25	1.38	110	1.25	1.34	107	(70-125)	2.80	(< 20)
Xylenes (total)	3.75	3.81	102	3.75	3.65	97	(78-124)	4.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1.25		94	1.25		94	(72-119)	0.15	

Batch Information

Analytical Batch: **VFC15762**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37628**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2021 06:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37628]
Blank Spike Lab ID: 1629612
Date Analyzed: 08/11/2021 14:57

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37628]
Spike Duplicate Lab ID: 1629613
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.1	104	12.5	13.2	105	(60-120)	0.92	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		76	1.25		83	(50-150)	8.40	

Batch Information

Analytical Batch: **VFC15762**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37628**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2021 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

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Matrix Spike Summary

Original Sample ID: 1629618
MS Sample ID: 1629619 MS
MSD Sample ID: 1629620 MSD

Analysis Date: 08/11/2021 18:34
Analysis Date: 08/11/2021 18:52
Analysis Date: 08/11/2021 19:10
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **AK101**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)						
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzene	1.48	1.39	3.01	111	1.39	2.54	77		75-125	16.90	(< 20)
Ethylbenzene	0.835	1.39	2.21	100	1.39	1.86	74	*	75-125	17.30	(< 20)
o-Xylene	1.63	1.39	2.84	88	1.39	2.38	54	*	75-125	17.60	(< 20)
P & M -Xylene	4.27	2.77	6.79	91	2.77	5.70	52	*	80-125	17.40	(< 20)
Toluene	5.18	1.39	6.53	97	1.39	5.49	22	*	70-125	17.20	(< 20)
Xylenes (total)	5.90	4.16	9.63	90	4.16	8.08	53	*	78-124	17.40	(< 20)
Surrogates											
1,4-Difluorobenzene (surr)		1.39	1.41	102	1.39	1.22	88		72-119	14.80	

Batch Information

Analytical Batch: VFC15762
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/11/2021 6:52:00PM

Prep Batch: VXX37628
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/11/2021 6:00:00AM
Prep Initial Wt./Vol.: 45.10g
Prep Extract Vol: 25.00mL

Print Date: 09/09/2021 10:38:58AM

Method Blank

Blank ID: MB for HBN 1823981 [VXX/37628]
Blank Lab ID: 1629609

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/kg
Ethylbenzene	12.5U	25.0	9.00	ug/kg
o-Xylene	12.5U	25.0	9.10	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
Xylenes (total)	37.5U	75.0	25.0	ug/kg
Surrogates				
1,4-Difluorobenzene (surr)	88.4	72-119		%

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/11/2021 3:33:00PM

Prep Batch: VXX37628
Prep Method: SW5035A
Prep Date/Time: 8/11/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37628]
Blank Spike Lab ID: 1629610
Date Analyzed: 08/11/2021 14:20

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37628]
Spike Duplicate Lab ID: 1629611
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **SW8021B**

	Blank Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1400	112	1250	1360	109	(75-125)	2.60	(< 20)
Ethylbenzene	1250	1310	105	1250	1260	101	(75-125)	4.00	(< 20)
o-Xylene	1250	1220	98	1250	1180	94	(75-125)	3.80	(< 20)
P & M -Xylene	2500	2580	103	2500	2480	99	(80-125)	4.30	(< 20)
Toluene	1250	1380	110	1250	1340	107	(70-125)	2.80	(< 20)
Xylenes (total)	3750	3810	102	3750	3650	97	(78-124)	4.10	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250		94	1250		94	(72-119)	0.15	

Batch Information

Analytical Batch: **VFC15762**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37628**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2021 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1629618
MS Sample ID: 1629619 MS
MSD Sample ID: 1629620 MSD

Analysis Date: 08/11/2021 18:34
Analysis Date: 08/11/2021 18:52
Analysis Date: 08/11/2021 19:10
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960002, 1214960004, 1214960005, 1214960006, 1214960007, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013, 1214960014

Results by **SW8021B**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)						
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)		CL	RPD (%)	RPD CL
Benzene	1480	1390	3010	111	1390	2540	77		75-125	16.90	(< 20)
Ethylbenzene	835	1390	2210	100	1390	1860	74	*	75-125	17.30	(< 20)
o-Xylene	1630	1390	2840	88	1390	2380	54	*	75-125	17.60	(< 20)
P & M -Xylene	4270	2770	6790	91	2770	5700	52	*	80-125	17.40	(< 20)
Toluene	5180	1390	6530	97	1390	5490	22	*	70-125	17.20	(< 20)
Xylenes (total)	5900	4160	9630	90	4160	8080	53	*	78-124	17.40	(< 20)
Surrogates											
1,4-Difluorobenzene (surr)		1390	1410	102	1390	1220	88		72-119	14.80	

Batch Information

Analytical Batch: VFC15762
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/11/2021 6:52:00PM

Prep Batch: VXX37628
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/11/2021 6:00:00AM
Prep Initial Wt./Vol.: 45.10g
Prep Extract Vol: 25.00mL

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Method Blank

Blank ID: MB for HBN 1824145 [VXX/37641]
Blank Lab ID: 1630264

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960015, 1214960017

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	2.00	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1824145 [VXX/37641]
Blank Lab ID: 1630264

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960015, 1214960017

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	5.00U	10.0	3.10	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	102	81-118		%
4-Bromofluorobenzene (surr)	104	85-114		%
Toluene-d8 (surr)	101	89-112		%

Method Blank

Blank ID: MB for HBN 1824145 [VXX/37641]
Blank Lab ID: 1630264

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960015, 1214960017

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS21053
Analytical Method: SW8260D
Instrument: Agilent 7890-75MS
Analyst: JMG
Analytical Date/Time: 8/13/2021 10:53:00AM

Prep Batch: VXX37641
Prep Method: SW5030B
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37641]
Blank Spike Lab ID: 1630265
Date Analyzed: 08/13/2021 11:08

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37641]
Spike Duplicate Lab ID: 1630266
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960015, 1214960017

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	29.2	97	30	29.6	99	(78-124)	1.60	(< 20)
1,1,1-Trichloroethane	30	29.6	99	30	29.5	98	(74-131)	0.16	(< 20)
1,1,2,2-Tetrachloroethane	30	29.4	98	30	30.5	102	(71-121)	3.70	(< 20)
1,1,2-Trichloroethane	30	29.6	99	30	30.1	100	(80-119)	1.60	(< 20)
1,1-Dichloroethane	30	28.7	96	30	28.7	96	(77-125)	0.22	(< 20)
1,1-Dichloroethene	30	28.2	94	30	28.2	94	(71-131)	0.13	(< 20)
1,1-Dichloropropene	30	29.8	99	30	29.6	99	(79-125)	0.37	(< 20)
1,2,3-Trichlorobenzene	30	26.6	89	30	28.0	94	(69-129)	5.30	(< 20)
1,2,3-Trichloropropane	30	29.7	99	30	30.9	103	(73-122)	3.90	(< 20)
1,2,4-Trichlorobenzene	30	28.0	93	30	29.0	97	(69-130)	3.60	(< 20)
1,2,4-Trimethylbenzene	30	31.4	105	30	31.8	106	(79-124)	1.20	(< 20)
1,2-Dibromo-3-chloropropane	30	28.9	96	30	30.2	101	(62-128)	4.40	(< 20)
1,2-Dibromoethane	30	29.1	97	30	29.6	99	(77-121)	1.80	(< 20)
1,2-Dichlorobenzene	30	29.2	98	30	29.8	99	(80-119)	1.90	(< 20)
1,2-Dichloroethane	30	27.5	92	30	28.0	93	(73-128)	1.60	(< 20)
1,2-Dichloropropane	30	29.0	97	30	29.1	97	(78-122)	0.32	(< 20)
1,3,5-Trimethylbenzene	30	31.5	105	30	31.9	106	(75-124)	1.50	(< 20)
1,3-Dichlorobenzene	30	29.5	98	30	30.1	100	(80-119)	1.80	(< 20)
1,3-Dichloropropane	30	29.5	98	30	30.0	100	(80-119)	1.70	(< 20)
1,4-Dichlorobenzene	30	29.6	99	30	30.1	100	(79-118)	1.60	(< 20)
2,2-Dichloropropane	30	30.7	102	30	30.4	101	(60-139)	1.20	(< 20)
2-Butanone (MEK)	90	87.1	97	90	87.4	97	(56-143)	0.33	(< 20)
2-Chlorotoluene	30	31.6	105	30	31.3	104	(79-122)	1.00	(< 20)
2-Hexanone	90	90.1	100	90	91.6	102	(57-139)	1.70	(< 20)
4-Chlorotoluene	30	30.7	102	30	31.2	104	(78-122)	1.60	(< 20)
4-Isopropyltoluene	30	31.3	104	30	31.3	104	(77-127)	0.20	(< 20)
4-Methyl-2-pentanone (MIBK)	90	86.2	96	90	88.4	98	(67-130)	2.50	(< 20)
Benzene	30	28.9	97	30	28.7	96	(79-120)	0.90	(< 20)
Bromobenzene	30	29.7	99	30	30.3	101	(80-120)	1.80	(< 20)
Bromochloromethane	30	27.5	92	30	27.8	93	(78-123)	1.30	(< 20)
Bromodichloromethane	30	28.7	96	30	28.9	96	(79-125)	0.78	(< 20)
Bromoform	30	29.3	98	30	29.4	98	(66-130)	0.35	(< 20)
Bromomethane	30	27.8	93	30	28.4	95	(53-141)	2.10	(< 20)
Carbon disulfide	45	42.2	94	45	41.9	93	(64-133)	0.80	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37641]
Blank Spike Lab ID: 1630265
Date Analyzed: 08/13/2021 11:08

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37641]
Spike Duplicate Lab ID: 1630266
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960015, 1214960017

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	29.6	99	30	29.5	99	(72-136)	0.31	(< 20)
Chlorobenzene	30	29.0	97	30	29.0	97	(82-118)	0.03	(< 20)
Chloroethane	30	34.4	115	30	31.1	104	(60-138)	10.10	(< 20)
Chloroform	30	27.9	93	30	27.9	93	(79-124)	0.17	(< 20)
Chloromethane	30	24.8	83	30	24.8	83	(50-139)	0.05	(< 20)
cis-1,2-Dichloroethene	30	27.8	93	30	27.9	93	(78-123)	0.45	(< 20)
cis-1,3-Dichloropropene	30	29.2	97	30	29.4	98	(75-124)	0.50	(< 20)
Dibromochloromethane	30	29.3	98	30	29.7	99	(74-126)	1.40	(< 20)
Dibromomethane	30	27.9	93	30	28.3	94	(79-123)	1.70	(< 20)
Dichlorodifluoromethane	30	24.0	80	30	23.8	79	(32-152)	0.88	(< 20)
Ethylbenzene	30	29.4	98	30	29.5	98	(79-121)	0.14	(< 20)
Freon-113	45	43.7	97	45	43.4	96	(70-136)	0.75	(< 20)
Hexachlorobutadiene	30	29.1	97	30	29.3	98	(66-134)	0.60	(< 20)
Isopropylbenzene (Cumene)	30	30.2	101	30	30.2	101	(72-131)	0.10	(< 20)
Methylene chloride	30	27.8	93	30	28.2	94	(74-124)	1.40	(< 20)
Methyl-t-butyl ether	45	42.7	95	45	43.2	96	(71-124)	1.30	(< 20)
Naphthalene	30	28.6	95	30	30.6	102	(61-128)	7.00	(< 20)
n-Butylbenzene	30	31.2	104	30	31.2	104	(75-128)	0.24	(< 20)
n-Propylbenzene	30	31.2	104	30	31.5	105	(76-126)	1.00	(< 20)
o-Xylene	30	29.3	98	30	29.4	98	(78-122)	0.34	(< 20)
P & M -Xylene	60	58.3	97	60	58.3	97	(80-121)	0.04	(< 20)
sec-Butylbenzene	30	30.8	103	30	30.9	103	(77-126)	0.34	(< 20)
Styrene	30	29.9	100	30	30.2	101	(78-123)	1.00	(< 20)
tert-Butylbenzene	30	30.7	102	30	30.9	103	(78-124)	0.62	(< 20)
Tetrachloroethene	30	29.8	99	30	29.7	99	(74-129)	0.06	(< 20)
Toluene	30	28.8	96	30	28.8	96	(80-121)	0.19	(< 20)
trans-1,2-Dichloroethene	30	28.2	94	30	28.2	94	(75-124)	0.03	(< 20)
trans-1,3-Dichloropropene	30	30.6	102	30	31.0	103	(73-127)	1.10	(< 20)
Trichloroethene	30	29.0	97	30	29.1	97	(79-123)	0.17	(< 20)
Trichlorofluoromethane	30	29.1	97	30	28.6	95	(65-141)	1.80	(< 20)
Vinyl acetate	30	29.3	98	30	29.7	99	(54-146)	1.30	(< 20)
Vinyl chloride	30	26.4	88	30	26.1	87	(58-137)	1.20	(< 20)
Xylenes (total)	90	87.6	97	90	87.6	97	(79-121)	0.09	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37641]
Blank Spike Lab ID: 1630265
Date Analyzed: 08/13/2021 11:08

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37641]
Spike Duplicate Lab ID: 1630266
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960015, 1214960017

Results by **SW8260D**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		100	30		100	(81-118)	0.58	
4-Bromofluorobenzene (surr)	30		103	30		104	(85-114)	0.88	
Toluene-d8 (surr)	30		100	30		100	(89-112)	0.00	

Batch Information

Analytical Batch: **VMS21053**
Analytical Method: **SW8260D**
Instrument: **Agilent 7890-75MS**
Analyst: **JMG**

Prep Batch: **VXX37641**
Prep Method: **SW5030B**
Prep Date/Time: **08/13/2021 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1824179 [VXX/37643]
Blank Lab ID: 1630375

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960002, 1214960014

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	10.0U	20.0	6.20	ug/kg
1,1,1-Trichloroethane	12.5U	25.0	7.80	ug/kg
1,1,2,2-Tetrachloroethane	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

Method Blank

Blank ID: MB for HBN 1824179 [VXX/37643]
Blank Lab ID: 1630375

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960002, 1214960014

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
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)	93	71-136		%
4-Bromofluorobenzene (surr)	96.4	55-151		%
Toluene-d8 (surr)	104	85-116		%

Method Blank

Blank ID: MB for HBN 1824179 [VXX/37643]
Blank Lab ID: 1630375

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960002, 1214960014

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS21055
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: S.S
Analytical Date/Time: 8/13/2021 11:28:00AM

Prep Batch: VXX37643
Prep Method: SW5035A
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37643]
Blank Spike Lab ID: 1630376
Date Analyzed: 08/13/2021 11:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960002, 1214960014

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	822	110	(78-125)
1,1,1-Trichloroethane	750	778	104	(73-130)
1,1,2,2-Tetrachloroethane	750	746	99	(70-124)
1,1,2-Trichloroethane	750	733	98	(78-121)
1,1-Dichloroethane	750	729	97	(76-125)
1,1-Dichloroethene	750	866	116	(70-131)
1,1-Dichloropropene	750	760	101	(76-125)
1,2,3-Trichlorobenzene	750	719	96	(66-130)
1,2,3-Trichloropropane	750	741	99	(73-125)
1,2,4-Trichlorobenzene	750	729	97	(67-129)
1,2,4-Trimethylbenzene	750	747	100	(75-123)
1,2-Dibromo-3-chloropropane	750	707	94	(61-132)
1,2-Dibromoethane	750	810	108	(78-122)
1,2-Dichlorobenzene	750	747	100	(78-121)
1,2-Dichloroethane	750	652	87	(73-128)
1,2-Dichloropropane	750	755	101	(76-123)
1,3,5-Trimethylbenzene	750	741	99	(73-124)
1,3-Dichlorobenzene	750	752	100	(77-121)
1,3-Dichloropropane	750	736	98	(77-121)
1,4-Dichlorobenzene	750	752	100	(75-120)
2,2-Dichloropropane	750	800	107	(67-133)
2-Butanone (MEK)	2250	2100	93	(51-148)
2-Chlorotoluene	750	734	98	(75-122)
2-Hexanone	2250	2070	92	(53-145)
4-Chlorotoluene	750	726	97	(72-124)
4-Isopropyltoluene	750	727	97	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2270	101	(65-135)
Acetone	2250	1930	86	(36-164)
Benzene	750	770	103	(77-121)
Bromobenzene	750	795	106	(78-121)
Bromochloromethane	750	810	108	(78-125)
Bromodichloromethane	750	841	112	(75-127)
Bromoform	750	834	111	(67-132)
Bromomethane	750	827	110	(53-143)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37643]
Blank Spike Lab ID: 1630376
Date Analyzed: 08/13/2021 11:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960002, 1214960014

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)		CL
Carbon disulfide	1130	1260	112		(63-132)
Carbon tetrachloride	750	825	110		(70-135)
Chlorobenzene	750	756	101		(79-120)
Chloroethane	750	789	105		(59-139)
Chloroform	750	717	96		(78-123)
Chloromethane	750	688	92		(50-136)
cis-1,2-Dichloroethene	750	776	103		(77-123)
cis-1,3-Dichloropropene	750	856	114		(74-126)
Dibromochloromethane	750	799	107		(74-126)
Dibromomethane	750	779	104		(78-125)
Dichlorodifluoromethane	750	852	114		(29-149)
Ethylbenzene	750	758	101		(76-122)
Freon-113	1130	1270	113		(66-136)
Hexachlorobutadiene	750	696	93		(61-135)
Isopropylbenzene (Cumene)	750	752	100		(68-134)
Methylene chloride	750	817	109		(70-128)
Methyl-t-butyl ether	1130	1130	100		(73-125)
Naphthalene	750	703	94		(62-129)
n-Butylbenzene	750	692	92		(70-128)
n-Propylbenzene	750	721	96		(73-125)
o-Xylene	750	762	102		(77-123)
P & M -Xylene	1500	1470	98		(77-124)
sec-Butylbenzene	750	702	94		(73-126)
Styrene	750	780	104		(76-124)
tert-Butylbenzene	750	735	98		(73-125)
Tetrachloroethene	750	829	111		(73-128)
Toluene	750	755	101		(77-121)
trans-1,2-Dichloroethene	750	833	111		(74-125)
trans-1,3-Dichloropropene	750	757	101		(71-130)
Trichloroethene	750	772	103		(77-123)
Trichlorofluoromethane	750	1080	144	*	(62-140)
Vinyl acetate	750	755	101		(50-151)
Vinyl chloride	750	757	101		(56-135)
Xylenes (total)	2250	2230	99		(78-124)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37643]
Blank Spike Lab ID: 1630376
Date Analyzed: 08/13/2021 11:43

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960002, 1214960014

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750		91	(71-136)
4-Bromofluorobenzene (surr)	750		92	(55-151)
Toluene-d8 (surr)	750		104	(85-116)

Batch Information

Analytical Batch: **VMS21055**
Analytical Method: **SW8260D**
Instrument: **VRA Agilent GC/MS 7890B/5977A**
Analyst: **S.S**

Prep Batch: **VXX37643**
Prep Method: **SW5035A**
Prep Date/Time: **08/13/2021 06:00**
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1630377
MS Sample ID: 1630378 MS
MSD Sample ID: 1630379 MSD

Analysis Date: 08/13/2021 16:15
Analysis Date: 08/13/2021 13:40
Analysis Date: 08/13/2021 13:55
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960001, 1214960002, 1214960014

Results by **SW8260D**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	9.35U	703	783	111	703	781	111	78-125	0.36	(< 20)
1,1,1-Trichloroethane	11.7U	703	748	106	703	731	104	73-130	2.20	(< 20)
1,1,2,2-Tetrachloroethane	0.935U	703	712	101	703	719	102	70-124	0.98	(< 20)
1,1,2-Trichloroethane	0.375U	703	694	99	703	703	100	78-121	1.30	(< 20)
1,1-Dichloroethane	11.7U	703	696	99	703	684	97	76-125	1.70	(< 20)
1,1-Dichloroethene	11.7U	703	838	119	703	809	115	70-131	3.60	(< 20)
1,1-Dichloropropene	11.7U	703	735	105	703	716	102	76-125	2.70	(< 20)
1,2,3-Trichlorobenzene	23.4U	703	697	99	703	838	119	66-130	18.40	(< 20)
1,2,3-Trichloropropane	0.935U	703	703	100	703	711	101	73-125	1.10	(< 20)
1,2,4-Trichlorobenzene	11.7U	703	700	100	703	744	106	67-129	6.10	(< 20)
1,2,4-Trimethylbenzene	23.4U	703	719	102	703	707	101	75-123	1.60	(< 20)
1,2-Dibromo-3-chloropropane	46.9U	703	676	96	703	693	99	61-132	2.50	(< 20)
1,2-Dibromoethane	0.469U	703	761	108	703	769	109	78-122	1.00	(< 20)
1,2-Dichlorobenzene	11.7U	703	718	102	703	718	102	78-121	0.03	(< 20)
1,2-Dichloroethane	0.935U	703	613	87	703	613	87	73-128	0.08	(< 20)
1,2-Dichloropropane	4.68U	703	715	102	703	706	100	76-123	1.30	(< 20)
1,3,5-Trimethylbenzene	11.7U	703	718	102	703	701	100	73-124	2.40	(< 20)
1,3-Dichlorobenzene	11.7U	703	721	103	703	700	100	77-121	3.00	(< 20)
1,3-Dichloropropane	4.68U	703	698	99	703	705	100	77-121	0.97	(< 20)
1,4-Dichlorobenzene	11.7U	703	722	103	703	705	100	75-120	2.40	(< 20)
2,2-Dichloropropane	11.7U	703	782	111	703	763	109	67-133	2.50	(< 20)
2-Butanone (MEK)	117U	2110	1940	92	2110	1940	92	51-148	0.45	(< 20)
2-Chlorotoluene	11.7U	703	716	102	703	689	98	75-122	3.80	(< 20)
2-Hexanone	46.9U	2110	1950	93	2110	1980	94	53-145	1.20	(< 20)
4-Chlorotoluene	11.7U	703	711	101	703	692	98	72-124	2.80	(< 20)
4-Isopropyltoluene	46.9U	703	691	98	703	661	94	73-127	4.50	(< 20)
4-Methyl-2-pentanone (MIBK)	117U	2110	2140	101	2110	2140	102	65-135	0.30	(< 20)
Acetone	117U	2110	1780	84	2110	1780	85	36-164	0.24	(< 20)
Benzene	5.85U	703	735	105	703	716	102	77-121	2.60	(< 20)
Bromobenzene	11.7U	703	755	107	703	746	106	78-121	1.20	(< 20)
Bromochloromethane	11.7U	703	765	109	703	766	109	78-125	0.21	(< 20)
Bromodichloromethane	0.935U	703	804	114	703	790	112	75-127	1.70	(< 20)
Bromoform	11.7U	703	786	112	703	798	114	67-132	1.60	(< 20)
Bromomethane	9.35U	703	738	105	703	714	102	53-143	3.30	(< 20)
Carbon disulfide	46.9U	1050	1210	115	1050	1180	112	63-132	3.10	(< 20)
Carbon tetrachloride	5.85U	703	797	113	703	780	111	70-135	2.20	(< 20)
Chlorobenzene	11.7U	703	723	103	703	714	102	79-120	1.30	(< 20)

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Matrix Spike Summary

Original Sample ID: 1630377
MS Sample ID: 1630378 MS
MSD Sample ID: 1630379 MSD

Analysis Date: 08/13/2021 16:15
Analysis Date: 08/13/2021 13:40
Analysis Date: 08/13/2021 13:55
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960001, 1214960002, 1214960014

Results by **SW8260D**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroethane	93.5U	703	728	104	703	692	98	59-139	5.10	(< 20)
Chloroform	1.88U	703	686	98	703	674	96	78-123	1.80	(< 20)
Chloromethane	11.7U	703	557	79	703	561	80	50-136	0.71	(< 20)
cis-1,2-Dichloroethene	11.7U	703	754	107	703	745	106	77-123	1.20	(< 20)
cis-1,3-Dichloropropene	5.85U	703	818	116	703	808	115	74-126	1.20	(< 20)
Dibromochloromethane	2.35U	703	762	108	703	761	108	74-126	0.12	(< 20)
Dibromomethane	11.7U	703	729	104	703	730	104	78-125	0.16	(< 20)
Dichlorodifluoromethane	23.4U	703	478	68	703	510	73	29-149	6.50	(< 20)
Ethylbenzene	11.7U	703	725	103	703	715	102	76-122	1.30	(< 20)
Freon-113	46.9U	1050	1220	116	1050	1180	112	66-136	3.80	(< 20)
Hexachlorobutadiene	9.35U	703	678	97	703	731	104	61-135	7.50	(< 20)
Isopropylbenzene (Cumene)	11.7U	703	727	103	703	718	102	68-134	1.10	(< 20)
Methylene chloride	46.9U	703	756	108	703	744	106	70-128	1.50	(< 20)
Methyl-t-butyl ether	46.9U	1050	1070	101	1050	1070	101	73-125	0.07	(< 20)
Naphthalene	11.7U	703	672	96	703	742	106	62-129	9.80	(< 20)
n-Butylbenzene	11.7U	703	658	94	703	639	91	70-128	2.90	(< 20)
n-Propylbenzene	11.7U	703	712	101	703	681	97	73-125	4.40	(< 20)
o-Xylene	11.7U	703	735	105	703	726	103	77-123	1.30	(< 20)
P & M -Xylene	23.4U	1410	1420	101	1410	1390	99	77-124	2.10	(< 20)
sec-Butylbenzene	11.7U	703	683	97	703	660	94	73-126	3.50	(< 20)
Styrene	11.7U	703	749	107	703	745	106	76-124	0.50	(< 20)
tert-Butylbenzene	11.7U	703	721	103	703	697	99	73-125	3.50	(< 20)
Tetrachloroethene	5.85U	703	799	114	703	770	110	73-128	3.80	(< 20)
Toluene	11.7U	703	733	104	703	723	103	77-121	1.30	(< 20)
trans-1,2-Dichloroethene	11.7U	703	858	122	703	775	110	74-125	10.10	(< 20)
trans-1,3-Dichloropropene	5.85U	703	728	104	703	726	103	71-130	0.26	(< 20)
Trichloroethene	2.35U	703	742	106	703	724	103	77-123	2.40	(< 20)
Trichlorofluoromethane	23.4U	703	1010	144 *	703	967	138	62-140	4.70	(< 20)
Vinyl acetate	46.9U	703	705	100	703	718	102	50-151	1.80	(< 20)
Vinyl chloride	0.375U	703	718	102	703	595	85	56-135	18.70	(< 20)
Xylenes (total)	35.1U	2110	2160	102	2110	2120	101	78-124	1.90	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		703	631	90	703	629	90	71-136	0.37	
4-Bromofluorobenzene (surr)		1170	884	75	1170	871	74	55-151	1.40	
Toluene-d8 (surr)		703	738	105	703	735	105	85-116	0.41	

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Matrix Spike Summary

Original Sample ID: 1630377
MS Sample ID: 1630378 MS
MSD Sample ID: 1630379 MSD

Analysis Date:
Analysis Date: 08/13/2021 13:40
Analysis Date: 08/13/2021 13:55
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960001, 1214960002, 1214960014

Results by **SW8260D**

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

Batch Information

Analytical Batch: VMS21055
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: S.S
Analytical Date/Time: 8/13/2021 1:40:00PM

Prep Batch: VXX37643
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 53.35g
Prep Extract Vol: 25.00mL

Print Date: 09/09/2021 10:39:14AM

Method Blank

Blank ID: MB for HBN 1824180 [VXX/37644]
Blank Lab ID: 1630380

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960017

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
1,4-Difluorobenzene (surr)	101	77-115		%
4-Bromofluorobenzene (surr)	93.4	50-150		%

Batch Information

Analytical Batch: VFC15765
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: MDT
Analytical Date/Time: 8/12/2021 11:59:00PM

Prep Batch: VXX37644
Prep Method: SW5030B
Prep Date/Time: 8/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37644]
Blank Spike Lab ID: 1630381
Date Analyzed: 08/13/2021 00:35

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37644]
Spike Duplicate Lab ID: 1630382
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960017

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.01	101	1.00	0.951	95	(60-120)	5.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		104	0.0500		110	(50-150)	5.30	

Batch Information

Analytical Batch: **VFC15765**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37644**
Prep Method: **SW5030B**
Prep Date/Time: **08/12/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1824182 [VXX/37645]
Blank Lab ID: 1630386

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960015, 1214960016

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0450	mg/L
Surrogates				
1,4-Difluorobenzene (surr)	101	77-115		%
4-Bromofluorobenzene (surr)	90.5	50-150		%

Batch Information

Analytical Batch: VFC15765
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: MDT
Analytical Date/Time: 8/13/2021 8:37:00AM

Prep Batch: VXX37645
Prep Method: SW5030B
Prep Date/Time: 8/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37645]
Blank Spike Lab ID: 1630387
Date Analyzed: 08/13/2021 12:48

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37645]
Spike Duplicate Lab ID: 1630388
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960015, 1214960016

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	0.935	94	1.00	0.936	94	(60-120)	0.09	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500		104	0.0500		104	(50-150)	0.23	

Batch Information

Analytical Batch: **VFC15765**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37645**
Prep Method: **SW5030B**
Prep Date/Time: **08/12/2021 06:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1824202 [VXX/37647]
Blank Lab ID: 1630470

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960003

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.00625U	0.0125	0.00400	mg/kg
Ethylbenzene	0.0125U	0.0250	0.00900	mg/kg
Gasoline Range Organics	1.25U	2.50	0.750	mg/kg
o-Xylene	0.0125U	0.0250	0.00910	mg/kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/kg
Toluene	0.0125U	0.0250	0.00780	mg/kg
Xylenes (total)	0.0375U	0.0750	0.0250	mg/kg
Surrogates				
1,4-Difluorobenzene (surr)	88.5	72-119		%
4-Bromofluorobenzene (surr)	99.6	50-150		%

Batch Information

Analytical Batch: VFC15766
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/13/2021 12:18:00PM

Prep Batch: VXX37647
Prep Method: SW5035A
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37647]
Blank Spike Lab ID: 1630471
Date Analyzed: 08/13/2021 11:06

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37647]
Spike Duplicate Lab ID: 1630473
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960003

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.25	1.21	97	1.25	1.22	98	(75-125)	0.58	(< 20)
Ethylbenzene	1.25	1.15	92	1.25	1.19	96	(75-125)	3.60	(< 20)
o-Xylene	1.25	1.12	90	1.25	1.17	94	(75-125)	4.40	(< 20)
P & M -Xylene	2.50	2.32	93	2.50	2.40	96	(80-125)	3.60	(< 20)
Toluene	1.25	1.19	95	1.25	1.20	96	(70-125)	1.00	(< 20)
Xylenes (total)	3.75	3.44	92	3.75	3.58	95	(78-124)	3.90	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1.25		96	1.25		95	(72-119)	0.36	

Batch Information

Analytical Batch: **VFC15766**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37647**
Prep Method: **SW5035A**
Prep Date/Time: **08/13/2021 06:00**
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37647]
Blank Spike Lab ID: 1630472
Date Analyzed: 08/13/2021 11:42

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37647]
Spike Duplicate Lab ID: 1630474
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960003

Results by **AK101**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	12.6	101	12.5	12.5	100	(60-120)	0.66	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		100	1.25		100	(50-150)	0.70	

Batch Information

Analytical Batch: **VFC15766**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37647**
Prep Method: **SW5035A**
Prep Date/Time: **08/13/2021 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

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Matrix Spike Summary

Original Sample ID: 1630476
MS Sample ID: 1630477 MS
MSD Sample ID: 1630478 MSD

Analysis Date: 08/13/2021 16:28
Analysis Date: 08/13/2021 16:46
Analysis Date: 08/13/2021 17:04
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960001, 1214960003

Results by **AK101**

		Matrix Spike (mg/kg)				Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1.07	1.39	2.20	81		1.39	2.26	86	75-125	2.80	(< 20)
Ethylbenzene	0.649	1.39	1.78	82		1.39	1.85	87	75-125	3.70	(< 20)
o-Xylene	1.34	1.39	2.39	76		1.39	2.47	82	75-125	3.30	(< 20)
P & M -Xylene	3.42	2.77	5.53	76	*	2.77	5.73	83	80-125	3.50	(< 20)
Toluene	3.79	1.39	4.70	65	*	1.39	4.84	76	70-125	3.10	(< 20)
Xylenes (total)	4.76	4.16	7.92	76	*	4.16	8.19	83	78-124	3.50	(< 20)
Surrogates											
1,4-Difluorobenzene (surr)		1.39	1.25	90		1.39	1.25	90	72-119	0.13	

Batch Information

Analytical Batch: VFC15766
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/13/2021 4:46:00PM

Prep Batch: VXX37647
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 45.10g
Prep Extract Vol: 25.00mL

Print Date: 09/09/2021 10:39:29AM

Method Blank

Blank ID: MB for HBN 1824202 [VXX/37647]
Blank Lab ID: 1630470

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960003

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/kg
Ethylbenzene	12.5U	25.0	9.00	ug/kg
o-Xylene	12.5U	25.0	9.10	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
Xylenes (total)	37.5U	75.0	25.0	ug/kg
Surrogates				
1,4-Difluorobenzene (surr)	88.5	72-119		%

Batch Information

Analytical Batch: VFC15766
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/13/2021 12:18:00PM

Prep Batch: VXX37647
Prep Method: SW5035A
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37647]
Blank Spike Lab ID: 1630471
Date Analyzed: 08/13/2021 11:06

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37647]
Spike Duplicate Lab ID: 1630473
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960003

Results by **SW8021B**

	Blank Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1210	97	1250	1220	98	(75-125)	0.58	(< 20)
Ethylbenzene	1250	1150	92	1250	1190	96	(75-125)	3.60	(< 20)
o-Xylene	1250	1120	90	1250	1170	94	(75-125)	4.40	(< 20)
P & M -Xylene	2500	2320	93	2500	2400	96	(80-125)	3.60	(< 20)
Toluene	1250	1190	95	1250	1200	96	(70-125)	1.00	(< 20)
Xylenes (total)	3750	3440	92	3750	3580	95	(78-124)	3.90	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250		96	1250		95	(72-119)	0.36	

Batch Information

Analytical Batch: **VFC15766**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37647**
Prep Method: **SW5035A**
Prep Date/Time: **08/13/2021 06:00**
Spike Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1630476
MS Sample ID: 1630477 MS
MSD Sample ID: 1630478 MSD

Analysis Date: 08/13/2021 16:28
Analysis Date: 08/13/2021 16:46
Analysis Date: 08/13/2021 17:04
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960001, 1214960003

Results by **SW8021B**

		Matrix Spike (ug/kg)				Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1070	1390	2200	81		1390	2260	86	75-125	2.80	(< 20)
Ethylbenzene	649	1390	1780	82		1390	1850	87	75-125	3.70	(< 20)
o-Xylene	1340	1390	2390	76		1390	2470	82	75-125	3.30	(< 20)
P & M -Xylene	3420	2770	5530	76	*	2770	5730	83	80-125	3.50	(< 20)
Toluene	3790	1390	4700	65	*	1390	4840	76	70-125	3.10	(< 20)
Xylenes (total)	4760	4160	7920	76	*	4160	8190	83	78-124	3.50	(< 20)
Surrogates											
1,4-Difluorobenzene (surr)		1390	1250	90		1390	1250	90	72-119	0.13	

Batch Information

Analytical Batch: VFC15766
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/13/2021 4:46:00PM

Prep Batch: VXX37647
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 45.10g
Prep Extract Vol: 25.00mL

Print Date: 09/09/2021 10:39:34AM

Method Blank

Blank ID: MB for HBN 1824254 [VXX/37655]
Blank Lab ID: 1630712

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	50.0U	100	30.0	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
o-Xylene	12.5U	25.0	7.80	ug/kg
P & M -Xylene	25.0U	50.0	15.0	ug/kg
Toluene	12.5U	25.0	7.80	ug/kg
Xylenes (total)	37.5U	75.0	22.8	ug/kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	93.2	71-136		%
4-Bromofluorobenzene (surr)	95.8	55-151		%
Toluene-d8 (surr)	103	85-116		%

Batch Information

Analytical Batch: VMS21061
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: S.S
Analytical Date/Time: 8/16/2021 9:53:00AM

Prep Batch: VXX37655
Prep Method: SW5035A
Prep Date/Time: 8/16/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37655]
Blank Spike Lab ID: 1630713
Date Analyzed: 08/16/2021 10:08

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	740	99	(75-123)
Ethylbenzene	750	754	101	(76-122)
o-Xylene	750	765	102	(77-123)
P & M -Xylene	1500	1480	98	(77-124)
Toluene	750	752	100	(77-121)
Xylenes (total)	2250	2240	100	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750		91	(71-136)
4-Bromofluorobenzene (surr)	750		91	(55-151)
Toluene-d8 (surr)	750		103	(85-116)

Batch Information

Analytical Batch: **VMS21061**
Analytical Method: **SW8260D**
Instrument: **VRA Agilent GC/MS 7890B/5977A**
Analyst: **S.S**

Prep Batch: **VXX37655**
Prep Method: **SW5035A**
Prep Date/Time: **08/16/2021 06:00**
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1630732
MS Sample ID: 1630735 MS
MSD Sample ID: 1630736 MSD

Analysis Date: 08/16/2021 14:27
Analysis Date: 08/16/2021 11:52
Analysis Date: 08/16/2021 12:08
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214960001

Results by **SW8260D**

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,2,4-Trimethylbenzene	58.5U	880	897	102	880	887	101	75-123	1.10	(< 20)
Ethylbenzene	14.7U	880	879	100	880	861	98	76-122	2.10	(< 20)
o-Xylene	14.7U	880	889	101	880	876	100	77-123	1.60	(< 20)
P & M -Xylene	29.4U	1760	1700	97	1760	1690	96	77-124	0.40	(< 20)
Toluene	14.7J	880	872	97	880	866	97	77-121	0.68	(< 20)
Xylenes (total)	44.0U	2640	2590	98	2640	2570	97	78-124	0.80	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		880	797	91	880	786	89	71-136	1.40	
4-Bromofluorobenzene (surr)		1470	1300	88	1470	1290	88	55-151	0.09	
Toluene-d8 (surr)		880	907	103	880	919	104	85-116	1.30	

Batch Information

Analytical Batch: VMS21061
Analytical Method: SW8260D
Instrument: VRA Agilent GC/MS 7890B/5977A
Analyst: S.S
Analytical Date/Time: 8/16/2021 11:52:00AM

Prep Batch: VXX37655
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/16/2021 6:00:00AM
Prep Initial Wt./Vol.: 42.60g
Prep Extract Vol: 25.00mL

Print Date: 09/09/2021 10:39:40AM

Method Blank

Blank ID: MB for HBN 1824324 [VXX/37668]
Blank Lab ID: 1630977

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960016

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.200	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	3.00U	6.00	3.00	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

Method Blank

Blank ID: MB for HBN 1824324 [VXX/37668]
Blank Lab ID: 1630977

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960016

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	5.00U	10.0	3.10	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	108	81-118		%
4-Bromofluorobenzene (surr)	98.8	85-114		%
Toluene-d8 (surr)	98.3	89-112		%

Method Blank

Blank ID: MB for HBN 1824324 [VXX/37668]
Blank Lab ID: 1630977

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960016

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS21070
Analytical Method: SW8260D
Instrument: VPA 780/5975 GC/MS
Analyst: JMG
Analytical Date/Time: 8/17/2021 3:09:00PM

Prep Batch: VXX37668
Prep Method: SW5030B
Prep Date/Time: 8/17/2021 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37668]
Blank Spike Lab ID: 1630978
Date Analyzed: 08/17/2021 15:24

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37668]
Spike Duplicate Lab ID: 1630979
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960016

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	32.3	108	30	31.4	105	(78-124)	2.90	(< 20)
1,1,1-Trichloroethane	30	31.6	105	30	30.4	101	(74-131)	3.70	(< 20)
1,1,2,2-Tetrachloroethane	30	30.2	101	30	29.7	99	(71-121)	1.60	(< 20)
1,1,2-Trichloroethane	30	31.5	105	30	30.7	102	(80-119)	2.50	(< 20)
1,1-Dichloroethane	30	30.9	103	30	29.4	98	(77-125)	4.80	(< 20)
1,1-Dichloroethene	30	28.1	94	30	29.1	97	(71-131)	3.50	(< 20)
1,1-Dichloropropene	30	31.6	105	30	30.5	102	(79-125)	3.30	(< 20)
1,2,3-Trichlorobenzene	30	31.2	104	30	30.9	103	(69-129)	1.10	(< 20)
1,2,3-Trichloropropane	30	30.3	101	30	29.5	99	(73-122)	2.70	(< 20)
1,2,4-Trichlorobenzene	30	32.4	108	30	31.7	106	(69-130)	2.20	(< 20)
1,2,4-Trimethylbenzene	30	30.5	102	30	30.2	101	(79-124)	0.99	(< 20)
1,2-Dibromo-3-chloropropane	30	30.6	102	30	30.6	102	(62-128)	0.15	(< 20)
1,2-Dibromoethane	30	32.7	109	30	31.8	106	(77-121)	2.80	(< 20)
1,2-Dichlorobenzene	30	29.5	98	30	29.1	97	(80-119)	1.10	(< 20)
1,2-Dichloroethane	30	30.1	100	30	29.1	97	(73-128)	3.30	(< 20)
1,2-Dichloropropane	30	31.4	105	30	30.8	103	(78-122)	1.90	(< 20)
1,3,5-Trimethylbenzene	30	30.5	102	30	30.1	100	(75-124)	1.30	(< 20)
1,3-Dichlorobenzene	30	30.0	100	30	29.6	99	(80-119)	1.40	(< 20)
1,3-Dichloropropane	30	31.2	104	30	30.6	102	(80-119)	1.80	(< 20)
1,4-Dichlorobenzene	30	29.8	99	30	29.6	99	(79-118)	0.74	(< 20)
2,2-Dichloropropane	30	31.9	106	30	30.8	103	(60-139)	3.50	(< 20)
2-Butanone (MEK)	90	94.3	105	90	94.8	105	(56-143)	0.47	(< 20)
2-Chlorotoluene	30	29.6	99	30	29.2	97	(79-122)	1.30	(< 20)
2-Hexanone	90	94.7	105	90	94.5	105	(57-139)	0.28	(< 20)
4-Chlorotoluene	30	29.7	99	30	29.5	98	(78-122)	0.72	(< 20)
4-Isopropyltoluene	30	31.3	104	30	31.3	104	(77-127)	0.11	(< 20)
4-Methyl-2-pentanone (MIBK)	90	98.6	110	90	96.3	107	(67-130)	2.30	(< 20)
Benzene	30	31.1	104	30	30.0	100	(79-120)	3.70	(< 20)
Bromobenzene	30	29.8	99	30	29.3	98	(80-120)	1.60	(< 20)
Bromochloromethane	30	31.4	105	30	30.5	102	(78-123)	3.10	(< 20)
Bromodichloromethane	30	32.2	107	30	31.3	104	(79-125)	2.80	(< 20)
Bromoform	30	32.3	108	30	31.6	105	(66-130)	2.20	(< 20)
Bromomethane	30	24.3	81	30	23.4	78	(53-141)	3.90	(< 20)
Carbon disulfide	45	41.9	93	45	43.1	96	(64-133)	2.70	(< 20)

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37668]
Blank Spike Lab ID: 1630978
Date Analyzed: 08/17/2021 15:24

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37668]
Spike Duplicate Lab ID: 1630979
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960016

Results by **SW8260D**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	32.0	107	30	30.9	103	(72-136)	3.40	(< 20)
Chlorobenzene	30	30.4	101	30	29.6	99	(82-118)	2.90	(< 20)
Chloroethane	30	30.0	100	30	22.3	74	(60-138)	29.20 *	(< 20)
Chloroform	30	30.5	102	30	29.5	98	(79-124)	3.40	(< 20)
Chloromethane	30	28.2	94	30	27.4	91	(50-139)	3.00	(< 20)
cis-1,2-Dichloroethene	30	30.4	101	30	30.2	101	(78-123)	0.88	(< 20)
cis-1,3-Dichloropropene	30	32.1	107	30	31.4	105	(75-124)	2.20	(< 20)
Dibromochloromethane	30	33.0	110	30	32.2	107	(74-126)	2.40	(< 20)
Dibromomethane	30	31.3	104	30	30.4	101	(79-123)	2.70	(< 20)
Dichlorodifluoromethane	30	30.0	100	30	28.8	96	(32-152)	3.90	(< 20)
Ethylbenzene	30	30.3	101	30	29.8	99	(79-121)	1.90	(< 20)
Freon-113	45	43.6	97	45	43.7	97	(70-136)	0.20	(< 20)
Hexachlorobutadiene	30	33.9	113	30	32.9	110	(66-134)	3.00	(< 20)
Isopropylbenzene (Cumene)	30	31.2	104	30	30.5	102	(72-131)	2.20	(< 20)
Methylene chloride	30	31.9	106	30	31.0	103	(74-124)	2.90	(< 20)
Methyl-t-butyl ether	45	49.0	109	45	47.4	105	(71-124)	3.30	(< 20)
Naphthalene	30	28.1	94	30	28.1	94	(61-128)	0.15	(< 20)
n-Butylbenzene	30	30.8	103	30	30.5	102	(75-128)	1.10	(< 20)
n-Propylbenzene	30	29.9	100	30	29.6	99	(76-126)	1.00	(< 20)
o-Xylene	30	30.6	102	30	30.0	100	(78-122)	2.10	(< 20)
P & M -Xylene	60	60.4	101	60	59.5	99	(80-121)	1.60	(< 20)
sec-Butylbenzene	30	30.5	102	30	29.8	99	(77-126)	2.20	(< 20)
Styrene	30	31.8	106	30	30.9	103	(78-123)	2.90	(< 20)
tert-Butylbenzene	30	30.4	101	30	30.2	101	(78-124)	0.82	(< 20)
Tetrachloroethene	30	31.2	104	30	30.4	101	(74-129)	2.60	(< 20)
Toluene	30	29.6	99	30	28.9	96	(80-121)	2.30	(< 20)
trans-1,2-Dichloroethene	30	31.5	105	30	30.4	101	(75-124)	3.80	(< 20)
trans-1,3-Dichloropropene	30	30.2	101	30	29.4	98	(73-127)	2.90	(< 20)
Trichloroethene	30	31.1	104	30	30.3	101	(79-123)	2.50	(< 20)
Trichlorofluoromethane	30	28.9	96	30	27.4	91	(65-141)	5.20	(< 20)
Vinyl acetate	30	28.8	96	30	28.2	94	(54-146)	2.00	(< 20)
Vinyl chloride	30	27.9	93	30	27.4	91	(58-137)	1.90	(< 20)
Xylenes (total)	90	91.0	101	90	89.4	99	(79-121)	1.80	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [VXX37668]
Blank Spike Lab ID: 1630978
Date Analyzed: 08/17/2021 15:24

Spike Duplicate ID: LCSD for HBN 1214960 [VXX37668]
Spike Duplicate Lab ID: 1630979
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960016

Results by **SW8260D**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		99	30		98	(81-118)	1.50	
4-Bromofluorobenzene (surr)	30		97	30		97	(85-114)	0.05	
Toluene-d8 (surr)	30		99	30		99	(89-112)	0.32	

Batch Information

Analytical Batch: **VMS21070**
Analytical Method: **SW8260D**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **JMG**

Prep Batch: **VXX37668**
Prep Method: **SW5030B**
Prep Date/Time: **08/17/2021 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1823794 [XXX/45346]
Blank Lab ID: 1628885

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960002, 1214960003, 1214960006, 1214960007

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	101	60-120		%

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 8/11/2021 8:29:00PM

Prep Batch: XXX45346
Prep Method: SW3550C
Prep Date/Time: 8/10/2021 7:32:49AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [XXX45346]
Blank Spike Lab ID: 1628886
Date Analyzed: 08/11/2021 20:39

Spike Duplicate ID: LCSD for HBN 1214960 [XXX45346]
Spike Duplicate Lab ID: 1628887
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960002, 1214960003, 1214960006, 1214960007

Results by **AK102**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	667	696	104	667	665	100	(75-125)	4.60	(< 20)
Surrogates									
5a Androstane (surr)	16.7		102	16.7		98	(60-120)	3.40	

Batch Information

Analytical Batch: **XFC16040**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **IVM**

Prep Batch: **XXX45346**
Prep Method: **SW3550C**
Prep Date/Time: **08/10/2021 07:32**
Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1823865 [XXX/45355]
Blank Lab ID: 1629145

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960015, 1214960016

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.227J	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	95.3	60-120		%

Batch Information

Analytical Batch: XFC16040
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 8/11/2021 3:35:00PM

Prep Batch: XXX45355
Prep Method: SW3520C
Prep Date/Time: 8/10/2021 5:06:39PM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [XXX45355]
Blank Spike Lab ID: 1629146
Date Analyzed: 08/11/2021 15:45

Spike Duplicate ID: LCSD for HBN 1214960 [XXX45355]
Spike Duplicate Lab ID: 1629147
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960015, 1214960016

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	20.8	104	20	20.8	104	(75-125)	0.17	(< 20)
Surrogates									
5a Androstane (surr)	0.4		104	0.4		108	(60-120)	3.00	

Batch Information

Analytical Batch: **XFC16040**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **IVM**

Prep Batch: **XXX45355**
Prep Method: **SW3520C**
Prep Date/Time: **08/10/2021 17:06**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1823884 [XXX/45357]
Blank Lab ID: 1629247

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960004, 1214960005, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	104	60-120		%

Batch Information

Analytical Batch: XFC16045
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: IVM
Analytical Date/Time: 8/12/2021 4:55:00PM

Prep Batch: XXX45357
Prep Method: SW3550C
Prep Date/Time: 8/11/2021 8:46:33AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [XXX45357]
Blank Spike Lab ID: 1629248
Date Analyzed: 08/12/2021 17:05

Spike Duplicate ID: LCSD for HBN 1214960 [XXX45357]
Spike Duplicate Lab ID: 1629249
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960004, 1214960005, 1214960008, 1214960009, 1214960010, 1214960011, 1214960012, 1214960013

Results by **AK102**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	667	687	103	667	633	95	(75-125)	8.20	(< 20)
Surrogates									
5a Androstane (surr)	16.7		111	16.7		102	(60-120)	9.30	

Batch Information

Analytical Batch: **XFC16045**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **IVM**

Prep Batch: **XXX45357**
Prep Method: **SW3550C**
Prep Date/Time: **08/11/2021 08:46**
Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1823898 [XXX/45363]
Blank Lab ID: 1629296

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1214960015, 1214960016

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0300J	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	66.4	42-86		%
Fluoranthene-d10 (surr)	74.9	50-97		%

Batch Information

Analytical Batch: XMS12841
Analytical Method: 8270D SIM LV (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 8/17/2021 1:07:00AM

Prep Batch: XXX45363
Prep Method: SW3535A
Prep Date/Time: 8/11/2021 11:30:04AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [XXX45363]
Blank Spike Lab ID: 1629297
Date Analyzed: 08/17/2021 01:27

Spike Duplicate ID: LCSD for HBN 1214960 [XXX45363]
Spike Duplicate Lab ID: 1629298
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1214960015, 1214960016

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

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.22	61	2	1.25	63	(41-115)	2.60	(< 20)
2-Methylnaphthalene	2	1.18	59	2	1.23	61	(39-114)	3.50	(< 20)
Acenaphthene	2	1.38	69	2	1.38	69	(48-114)	0.07	(< 20)
Acenaphthylene	2	1.43	72	2	1.43	72	(35-121)	0.31	(< 20)
Anthracene	2	1.46	73	2	1.39	70	(53-119)	4.70	(< 20)
Benzo(a)Anthracene	2	1.32	66	2	1.26	63	(59-120)	5.30	(< 20)
Benzo[a]pyrene	2	1.43	72	2	1.36	68	(53-120)	4.80	(< 20)
Benzo[b]Fluoranthene	2	1.36	68	2	1.29	64	(53-126)	5.40	(< 20)
Benzo[g,h,i]perylene	2	1.54	77	2	1.49	75	(44-128)	3.10	(< 20)
Benzo[k]fluoranthene	2	1.42	71	2	1.37	68	(54-125)	3.70	(< 20)
Chrysene	2	1.42	71	2	1.36	68	(57-120)	4.10	(< 20)
Dibenzo[a,h]anthracene	2	1.56	78	2	1.49	75	(44-131)	4.50	(< 20)
Fluoranthene	2	1.39	69	2	1.33	66	(58-120)	4.50	(< 20)
Fluorene	2	1.44	72	2	1.43	71	(50-118)	0.88	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.53	76	2	1.46	73	(48-130)	4.50	(< 20)
Naphthalene	2	1.22	61	2	1.26	63	(43-114)	3.20	(< 20)
Phenanthrene	2	1.47	74	2	1.40	70	(53-115)	4.90	(< 20)
Pyrene	2	1.43	71	2	1.35	68	(53-121)	5.50	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2		61	2		64	(42-86)	5.60	
Fluoranthene-d10 (surr)	2		70	2		69	(50-97)	1.20	

Batch Information

Analytical Batch: **XMS12841**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **LAW**

Prep Batch: **XXX45363**
Prep Method: **SW3535A**
Prep Date/Time: **08/11/2021 11:30**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

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

Method Blank

Blank ID: MB for HBN 1823999 [XXX/45370]
Blank Lab ID: 1629669

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214960001, 1214960002

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
2-Methylnaphthalene	12.5U	25.0	6.25	ug/kg
Acenaphthene	12.5U	25.0	6.25	ug/kg
Acenaphthylene	12.5U	25.0	6.25	ug/kg
Anthracene	12.5U	25.0	6.25	ug/kg
Benzo(a)Anthracene	12.5U	25.0	6.25	ug/kg
Benzo[a]pyrene	12.5U	25.0	6.25	ug/kg
Benzo[b]Fluoranthene	12.5U	25.0	6.25	ug/kg
Benzo[g,h,i]perylene	12.5U	25.0	6.25	ug/kg
Benzo[k]fluoranthene	12.5U	25.0	6.25	ug/kg
Chrysene	12.5U	25.0	6.25	ug/kg
Dibenzo[a,h]anthracene	12.5U	25.0	6.25	ug/kg
Fluoranthene	12.5U	25.0	6.25	ug/kg
Fluorene	12.5U	25.0	6.25	ug/kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	6.25	ug/kg
Naphthalene	10.0U	20.0	5.00	ug/kg
Phenanthrene	12.5U	25.0	6.25	ug/kg
Pyrene	12.5U	25.0	6.25	ug/kg
Surrogates				
2-Methylnaphthalene-d10 (surr)	95.9	58-103		%
Fluoranthene-d10 (surr)	97.3	54-113		%

Batch Information

Analytical Batch: XMS12835
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/17/2021 12:02:00AM

Prep Batch: XXX45370
Prep Method: SW3550C
Prep Date/Time: 8/12/2021 12:54:20PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214960 [XXX45370]
Blank Spike Lab ID: 1629670
Date Analyzed: 08/17/2021 00:22

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960002

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

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	105	95	(43-111)
2-Methylnaphthalene	111	104	94	(39-114)
Acenaphthene	111	107	97	(44-111)
Acenaphthylene	111	106	95	(39-116)
Anthracene	111	107	96	(50-114)
Benzo(a)Anthracene	111	104	93	(54-122)
Benzo[a]pyrene	111	104	94	(50-125)
Benzo[b]Fluoranthene	111	110	99	(53-128)
Benzo[g,h,i]perylene	111	104	93	(49-127)
Benzo[k]fluoranthene	111	104	94	(56-123)
Chrysene	111	104	94	(57-118)
Dibenzo[a,h]anthracene	111	107	97	(50-129)
Fluoranthene	111	105	94	(55-119)
Fluorene	111	108	97	(47-114)
Indeno[1,2,3-c,d] pyrene	111	104	93	(49-130)
Naphthalene	111	102	92	(38-111)
Phenanthrene	111	110	99	(49-113)
Pyrene	111	104	93	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111		99	(58-103)
Fluoranthene-d10 (surr)	111		97	(54-113)

Batch Information

Analytical Batch: **XMS12835**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **LAW**

Prep Batch: **XXX45370**
Prep Method: **SW3550C**
Prep Date/Time: **08/12/2021 12:54**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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

Matrix Spike Summary

Original Sample ID: 1215009014
MS Sample ID: 1629671 MS
MSD Sample ID: 1629672 MSD

Analysis Date: 08/17/2021 0:43
Analysis Date: 08/17/2021 1:03
Analysis Date: 08/17/2021 1:24
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214960001, 1214960002

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

		Matrix Spike (ug/kg)			Spike Duplicate (ug/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	13.1U	114	102	89	116	97.8	84	43-111	4.00	(< 20)
2-Methylnaphthalene	13.1U	114	99.6	87	116	96.2	83	39-114	3.50	(< 20)
Acenaphthene	13.1U	114	101	88	116	97.3	84	44-111	3.90	(< 20)
Acenaphthylene	13.1U	114	102	89	116	99.3	85	39-116	2.40	(< 20)
Anthracene	13.1U	114	107	93	116	109	94	50-114	2.60	(< 20)
Benzo(a)Anthracene	13.1U	114	104	91	116	98.6	85	54-122	5.60	(< 20)
Benzo[a]pyrene	13.1U	114	106	93	116	101	87	50-125	4.60	(< 20)
Benzo[b]Fluoranthene	13.1U	114	114	99	116	104	89	53-128	9.40	(< 20)
Benzo[g,h,i]perylene	13.1U	114	108	94	116	103	89	49-127	4.30	(< 20)
Benzo[k]fluoranthene	13.1U	114	105	91	116	106	91	56-123	0.91	(< 20)
Chrysene	13.1U	114	108	94	116	103	88	57-118	5.20	(< 20)
Dibenzo[a,h]anthracene	13.1U	114	106	92	116	101	87	50-129	4.20	(< 20)
Fluoranthene	13.1U	114	111	97	116	106	91	55-119	5.00	(< 20)
Fluorene	13.1U	114	102	89	116	101	87	47-114	1.10	(< 20)
Indeno[1,2,3-c,d] pyrene	13.1U	114	105	91	116	100	86	49-130	4.20	(< 20)
Naphthalene	10.4U	114	108	94	116	105	90	38-111	3.30	(< 20)
Phenanthrene	13.1U	114	109	96	116	111	95	49-113	1.40	(< 20)
Pyrene	13.1U	114	110	96	116	104	90	55-117	5.50	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		114	113	99	116	110	95	58-103	2.80	
Fluoranthene-d10 (surr)		114	113	99	116	107	92	54-113	5.60	

Batch Information

Analytical Batch: XMS12835
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/17/2021 1:03:00AM

Prep Batch: XXX45370
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 8/12/2021 12:54:20PM
Prep Initial Wt./Vol.: 22.87g
Prep Extract Vol: 5.00mL

Print Date: 09/09/2021 10:40:08AM

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1214960

Page 1 of 2

Section 1

CLIENT: Shannon & Wilson

CONTACT: Alex Geilich

PHONE #:

PROJECT NAME: Holy Cross 01

PROJECT/ PWSID/ PERMIT#: 106942

REPORTS TO:

E-MAIL:

Profile #: 369968 GM

INVOICE TO:

QUOTE #:

P.O. #:

Instructions: Sections 1 - 5 m
Omissions may delay the ons

Section 3

Pres

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis* GRO - AK101	BTEX - 8021B	VOC - 8260 D	DRO AK102	PAH - 8270 D SIM						REMARKS/LOC ID
							meoh	meoh	meoh	none	none						
1 AB	106942-TP1-S6	8/3/21	1250	S	2	G	X		X	X	X						
2 AB	106942-TP1-S7	8/3/21	1300	S	2	G	X		X	X	X						
3 AB	106942-TP2-S4	8/3/21	1110	S	2	G	X	X		X							
4 AB	106942-TP2-S6	8/3/21	1130	S	2	G	X	X		X							
5 AB	106942-TP3-S1	8/3/21	1510	S	2	G	X	X		X							
6 AB	106942-TP3-S5	8/3/21	1540	S	2	G	X	X		X							
7 AB	106942-TP4-S5	8/3/21	1410	S	2	G	X	X		X							
8 AB	106942-TP4-S7	8/3/21	1440	S	2	G	X	X		X							
9 AB	106942-TP5-S2	8/4/21	845	S	2	G	X	X		X							
10 AB	106942-TP5-S6	8/4/21	910	S	2	G	X	X		X							

NOTE:
*The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

	Date	Time	
Relinquished By: (1)	8/5/21	0830	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	08/09/21	1133	Received For Laboratory By:

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Standard

Temp Blank °C: 4.4 C 060

or Ambient [ ]

Chain of Custody Seal: (Circle)

INTACT IF BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

http://www.sgs.com/terms-and-conditions

SGS North America Inc.
CHAIN OF CUSTODY RECORD

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Section 1

CLIENT: Shannon & Wilson

CONTACT: Alex Geilich — PHONE #:

PROJECT NAME: Holy Cross Oil — PROJECT/ PWSID/ PERMIT#: 106942

REPORTS TO: — E-MAIL: — Profile #:

INVOICE TO: — QUOTE #: — P.O. #:

Section 3 — Preservative

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incremental)	Analysis* GRO-AK101 (MeOH)	BTEX-8021B (MeOH)	DRO-AK102 (None)	VOC-8260D (HCl)	GRO-AK101 (HCl)	VOC-8260D (HCl)	DRO-AK102 (HCl)	PAH-8270D SIM (None)			REMARKS/LOC ID
(1)AB	106942-TP6-S3	8/4/21	1010	S	2	G	X	X	X								
(2)AB	106942-TP6-S7	8/4/21	1025	S	2	G	X	X	X								
(3)AB	106942-TP6-S8	8/4/21	1040	S	2	G	X	X	X								
(4)AJ	106942-TB-S1	8/3/21	1715	S	1	G	X			X							Trip Blank
(5)AJ	106942-TW-TP3	8/4/21	~~10~~ 1305	W	12	G					X	X	X	X			
(6)AJ	106942-TW-TP7	8/4/21	1345	W	12	G					X	X	X	X			
(7)AJ	106942-TB-W1	8/4/21	1400	W	6	G					X	X					Trip Blank
(8)AB																	

NOTE: *The following analyses require specific method and/or compound list: BTEX, Metals, PFAS

Section 5

Relinquished By:	Date	Time	Received By:
(1)	8/5/21	0830	
(2)			
(3)			
(4)	08/04/21	1133	Received For Laboratory By:

Section 4 — DOD Project? Yes (No) — Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions: Standard

Temp Blank °C: 4.4 0GO or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

http://www.sgs.com/terms-and-conditions

SGS

Returned Bottles Inventory

Name of individual returning bottles: Shannon & Wilson

Date Received: 08/09/21

Client Name: Shannon & Wilson

Received by: CRC

Project Name: Holy Cross 0.1

SGS PM: Justin Nelson

HDPE/Nalgene:	1-L						
	500-ml						
	250-ml or 8-oz						
	125-ml or 4-oz						
	60-ml or 2-oz						
	other						
amber glass:	1-L						
	500-ml						
	250-ml or 8-oz						
	125-ml or 4-oz with or without septa	~~48~~ 52					
	40-ml VOA vial	2					
	other						
Subtotal:							

Note: Returned bottles (regardless of size/pres.) are billed back at $4/bottle ***unless otherwise quoted.***

Amount to Invoice Client $: 216.00

WO#: 1214960

e-Sample Receipt Form

SGS Workorder #:	1214960	1214960

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		Yes — Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	Yes	1F
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 @ 4.4 °C Therm. ID: D60
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		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,200.8/6020B).
Were proper containers (type/mass/volume/preservative***)used?	No	Samples 15A-B and 16A-B were preserved with LOT LW09-0463-17-09. PM Notified.
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1214960001-A	No Preservative Required	OK
1214960001-B	Methanol field pres. 4 C	OK
1214960002-A	No Preservative Required	OK
1214960002-B	Methanol field pres. 4 C	OK
1214960003-A	No Preservative Required	OK
1214960003-B	Methanol field pres. 4 C	OK
1214960004-A	No Preservative Required	OK
1214960004-B	Methanol field pres. 4 C	OK
1214960005-A	No Preservative Required	OK
1214960005-B	Methanol field pres. 4 C	OK
1214960006-A	No Preservative Required	OK
1214960006-B	Methanol field pres. 4 C	OK
1214960007-A	No Preservative Required	OK
1214960007-B	Methanol field pres. 4 C	OK
1214960008-A	No Preservative Required	OK
1214960008-B	Methanol field pres. 4 C	OK
1214960009-A	No Preservative Required	OK
1214960009-B	Methanol field pres. 4 C	OK
1214960010-A	No Preservative Required	OK
1214960010-B	Methanol field pres. 4 C	OK
1214960011-A	No Preservative Required	OK
1214960011-B	Methanol field pres. 4 C	OK
1214960012-A	No Preservative Required	OK
1214960012-B	Methanol field pres. 4 C	OK
1214960013-A	No Preservative Required	OK
1214960013-B	Methanol field pres. 4 C	OK
1214960014-A	Methanol field pres. 4 C	OK
1214960015-A	HCL to pH < 2	OK
1214960015-B	HCL to pH < 2	OK
1214960015-C	No Preservative Required	OK
1214960015-D	No Preservative Required	OK
1214960015-E	HCL to pH < 2	OK
1214960015-F	HCL to pH < 2	OK
1214960015-G	HCL to pH < 2	OK
1214960015-H	HCL to pH < 2	OK
1214960015-I	HCL to pH < 2	OK
1214960015-J	HCL to pH < 2	OK
1214960016-A	HCL to pH < 2	OK
1214960016-B	HCL to pH < 2	OK
1214960016-C	No Preservative Required	OK
1214960016-D	No Preservative Required	OK
1214960016-E	HCL to pH < 2	OK
1214960016-F	HCL to pH < 2	OK
1214960016-G	HCL to pH < 2	OK
1214960016-H	HCL to pH < 2	OK
1214960016-I	HCL to pH < 2	OK
1214960016-J	HCL to pH < 2	OK
1214960017-A	HCL to pH < 2	OK
1214960017-B	HCL to pH < 2	OK
1214960017-C	HCL to pH < 2	OK
1214960017-D	HCL to pH < 2	OK
1214960017-E	HCL to pH < 2	OK
1214960017-F	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

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: Alex Geilich
Title: Environmental Scientist
Date: November 2021

Consultant Firm: Shannon & Wilson, Inc.

Laboratory Name: SGS North America Inc.
Laboratory Report Number: 1214960
Laboratory Report Date: 9/9/21

Contaminated Site Name: Holy Cross Oil Company
ADEC File Number: 2417.38.002
Hazard Identification Number: 1315

(**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 4.4° 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: *Samples TW-TP3 and TW-TP7 were received outside of acceptable pH; however, the laboratory added preservative and proceeded with analysis.*

e. Data quality or usability affected?
Comments: *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:

- *106942-TP1-S6 - AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.*
- *106942-TP1-S7 - AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.*
- *106942-TP2-S4 - AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.*
- *106942-TP2-S6 - AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.*
- *106942-TP4-S5 - AK102/103 - Surrogate recovery for 5a androstane and n-triacontane do not meet QC criteria, due to matrix interference.*
- *106942-TW-TP3 - 8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. Sample was re-extracted past 14 day hold-time to confirm results. Re-analysis confirms original results. In-hold data is reported.*
- *106942-TW-TP7 - 8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. Sample was re-extracted past 14 day hold-time to confirm results. Re-analysis confirms original results. In-hold data is reported.*
- *LCS - 8260D - LCS recovery for Trichlorofluoromethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.*
- *LCSD - 8260D - LCSD RPD for chloroethane does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.*

- *Method Blank - 8270D SIM - Phenanthrene is detected in the PAH method blank at greater than 1/2 the LOQ. There are no DOD samples reporting this analyte above the LOQ.*
- *MSD - 8021B - MSD recoveries for several analytes do not meet QC criteria, please refer to LCS/LCSD for accuracy requirements.*

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*:*
For soil samples, the LOQs for 1,2,3-trichloropropane and dibromochloromethane exceed the ADEC cleanup levels. For Sample TP1-S7, the LOQ for 31 additional VOC analytes exceeds the ADEC cleanup levels due to sample dilution required for laboratory analysis.
For water samples, the LOQ for 1,2,3-trichloropropane exceeds the ADEC cleanup level.

e. Data quality or usability affected?
Comments: *There is a potential that these target analytes are present at concentrations greater than the ADEC cleanup levels, but less than the LOQs.*

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 less than the LOQ, a method blank contained estimated concentrations of DRO (0.227 J mg/L) and phenanthrene (0.0300 J ug/L)*

iii. If above LOQ or project specified objectives, what samples are affected?
Comments: *Samples TW-TP3 and TW-TP7*

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes / No / NA
Comments: S*amples are flagged "B" in Table 3 when the reported sample concentration is within 10x the reported method blank concentration. Detected concentrations of DRO between 5x and 10x of the method blank detection in Samples TW-TP3 and TW-TP7 are flagged "B" at the detected value in Table 3. Estimated concentrations of phenanthrene were detected in TW-TP3 and TW-TP7 at concentrations less than the LOQ; therefore, the sample concentrations are reported as non-detect at the LOQ and flagged "B" in Table 3*

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: *%R for trichlorofluoromethane exceeds laboratory control limits in an LCS.*

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: *RPD for chloroethane exceeds laboratory control limits.*

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: *Samples TP1-S6, TP1-S7, and TB-S1 are affected by the LCS %R failure. Sample TW-TP7 is affected by the RPD failure.*

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?
Yes / No / NA
Comments: *Trichlorofluoromethane and chloroethane were not detected in the affected samples, therefore flagging is not required.*

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 *w*ithin 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: *%R for ethylbenzene, toluene, and xylenes was below laboratory control limits in an MSD. % R for toluene and xylenes was below laboratory control limits in an MS.*

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:

v. If %R or RPD is outside of acceptable limits, what samples are affected?
Comments: *Samples TP1-S7, TP2-S6, TP3-S1, TP3-S5, TP4-S5, TP4-S7, TP5-S2, TP5-S6, TP6-S3, TP6-S7, TP6-S8, and TB-S1 were affected by the MSD failure. Samples TP1-S6 and TP2-S4 were affected by the MS failure.*

vi. Do the affected samples(s) have data flags? If so, are the data flags clearly defined?
Yes / No / NA
Comments: *The MS/MSD sample was taken from another work order. Therefore, flagging is not required for Samples TP1-S6 and TP2-S4. The case narrative*

indicates that the LCS should be referred to for accuracy requirements for the MSD failures. Therefore, flagging is not required for Samples TP1-S7, TP2-S6, TP3-S1, TP3-S5, TP4-S5, TP4-S7, TP5-S2, TP5-S6, TP6-S3, TP6-S7, TP6-S8, and TB-S1.

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: *AK 101 %R for 4-bromofluorobenzene exceeds laboratory control limits in Samples TP1-S6, TP1-S7, TP2-S4, and TP2-S6. AK 102/103 %R for 5a androstane was below laboratory control limits in Sample TP4-S5. Method 8270 %R for fluoranthene-d10 was below laboratory control limits in Samples TW-TP3 and TW-TP7.*

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: *Surrogate recovery failures in Samples TP1-S6, TP1-S7, TP2-S4, and TP2-S6 were due to matrix interference; therefore, samples are considered biased high and are flagged J+ in Table 2. The surrogate recovery failure in sample TP4-S5 was due to sample dilution; therefore, no flagging is required. The associated analytes for surrogate recovery failures in samples TW-TP3 and TW-TP7 were not detected; results are reported as non-detect and flagged "J" in Table 3.*

iv. Data quality or usability affected?
Comments: *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:

ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes / No / NA**
Comments: *Only one cooler was used to transport the samples.*

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: *See above.*

f. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?
Yes / No / NA
Comments: *Sample TP6-S8 is a field duplicate of Sample TP6-S7. Sample TW-TP7 is a field duplicate of Sample TW-TP3.*

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: *The RPDs for GRO, 1,3,5-trimethylbenzene, 4-isopropyltoluene, isopropylbenzene, n-propylbenzene, sec-butylbenzene, and tert-butylbenzene in Sample Set TW-TP3/TW-TP7 are greater than 30%.*

iv. Data quality or usability affected?
Comments: *Results for the above analytes in Samples TW-TP3/TW-TP7 have been flagged "E" in table 2 and are considered estimated.*

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

Yes / No / NA
Comments: *A decontamination or equipment blank was not included in our ADEC-approved work plan.*

i. All results less than LOQ and project specified objectives?
Yes / No / NA
Comments:

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 5

IMPORTANT INFORMATION

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