SRF 21-01 2021 Trenching and Flowline Installation Project, Swanson River Field

November 3, 2021

This document has been prepared by Susitna Environmental, LLC (Susitna) of behalf of Hilcorp Alaska, LLC (Hilcorp) to summarize 2021 historical contamination response efforts conducted during flowline trenching activities for Swanson River Field (SRF) 21-01. SRF 21-01 refers to two flowlines planned for installation to convey production fluids from wells on pads Swanson River Unit (SRU) 21-15 and SRU 32-15 to Tank Setting (TS) 2-15. Trenching to Pad SRU 21-15 did not occur in 2021.

Historical contamination was encountered during trenching activities between well pad SRU 32-15 and TS 2-15, located in the northern part of the Hilcorp-operated SRF. Susitna provided in-field Qualified Environmental Professional (QEP) oversight and performed field screening and sampling. This work was conducted in accordance with the Contaminated Soil and Water Management Plan for 2021 Flowline Installations and Inspections (Hilcorp, 2021). The location of the project site is shown on Figure 1 and the extent of the excavation is provided on Figure 2. The discovered historical contamination was added to the Alaska Department of Environmental Conservation (ADEC) Contaminated Site Report: Swanson River Tank Setting 2-15, Hazard ID: 444, File number 2334.38.022.

Contamination Observations and Findings

- Soil staining and hydrocarbon odor was observed from approximately 2 to 4 feet below ground surface (bgs) along a section of the trench approximately 23 feet in length.
- During excavation activities on July 28, 2021, the QEP observed a silty clay layer at 2 feet bgs. This soil contained a strong hydrocarbon odor and had a photoionization detector (PID) reading of 278.6 parts per million (ppm) in a grab screening sample collected from the floor of the trench at the location where contamination was initially observed.

Excavation Activities Summary

- Excavation of the trench took place from July 22 to August 3, 2021.
- The section where contamination was observed was approximately 10 feet west of the main roadway, located between the roadway and an inactive utility water well on pad SRU 32-15. The excavation was approximately 23 feet long, 4 feet deep and 2 feet wide (Figure 2).
- Strong hydrocarbon odor and staining from historical drilling and production operations was observed during excavation activities in the trench sidewalls and floor from 2 to 4 feet bgs in the silty clay layer. The vertical and lateral extent of contamination was not fully delineated; however, the beginning and end points along the trench were.

- The silty clay layer was encountered from 2 to 4 feet bgs and along the entire floor of the contaminated section of trench.

Stockpiled Material

- 50 cubic yards (cy) of unimpacted soil was removed during trenching activities and staged directly on the ground surface next to the trench for use as backfill material. The QEP routinely inspected the stockpiled material for evidence of impact.
- Soil removed from the affected section of the trench was impacted by petroleum, oil, and lubricants (POL) and was placed either in 3.5-cy dragon boxes or on 20-mil liner and covered. Impacted soil staged on liner was later transferred to additional dragon boxes.
- A total of 12 cy of impacted material was removed from the trench and containerized.

Excavation Sampling Effort

- Six soil screening samples were collected to guide segregation of impacted soil from unimpacted soil. PID results ranged from 0.8 to 2,056 ppm (**Table 1**). One analytical characterization sample was collected from the location with the highest screening result and submitted for laboratory analysis.
- The sidewalls and floor of the impacted portion of the trench were screened in accordance with ADEC Field Sampling Guidance (ADEC, 2019). Nine screening samples were collected from the north wall, nine from the south wall, and 5 screening samples were collected from the trench floor. PID results ranged from 1.6 to 1,518 ppm (**Table 1**).
- Analytical samples were collected from the north (one primary sample and one duplicate) and south sidewalls, and from the silty clay layer of the trench floor at 4 ft bgs. Samples were collected from locations with the highest PID screening results and analyzed for diesel range organics (DRO), residual range organics (RRO), gasoline range organics (GRO), petroleum-related volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and Resource Conservation and Recovery Act (RCRA) metals.

Results

Analytical results are compared to the most stringent of the 18 Alaska Administrative Code (AAC) 75.341 Method Two Table B1/B2 Human Health and Migration to Groundwater Soil Cleanup Levels for the Under 40-Inch Zone. Barium is compared to the Human Health Soil Cleanup Level for the Under 40-Inch Zone.

- The characterization sample (2-15-EX-01) contained several VOCs, PAHs, GRO, and DRO exceeding ADEC cleanup levels (**Table 2**).
- The floor sample, 2-15-FL-01, contained 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, naphthalene, ethylbenzene, total xylenes, 1- and 2-methylnaphthalene, GRO and DRO in concentrations exceeding ADEC soil cleanup levels (**Table 2**).
- Naphthalene was detected above ADEC cleanup levels in all soil samples, and the south sidewall sample (2-15-S-01) also exceeded the cleanup level for DRO (**Table 2**).

- 1,2-Dibromoethane, 1,2-dichloroethane, benzene, methyl-tert-butyl ether, benzo(a)anthracene, and benzo(a)pyrene had LODs exceeding the respective PALs in one or more samples (**Table 2**). Data quality is not affected for results lacking adequate analytical sensitivity; however, non-detect results with LODs exceeding the PAL cannot be used to rule out the potential presence of the analyte at concentrations above the cleanup level for the sampled location (**Appendix E**).
- All soil samples exceeded the ADEC cleanup level for arsenic; however, concentrations are within background levels.

Backfill Activities

Backfilling of the trench commenced after the flowline was installed. Additional clean weed-free backfill was brought in to replace the removed impacted material.

Disposal

A total of 12 cy of impacted material was transported to the Kenai Gas Field (KGF) Grind and Inject (G&I) facility in Kenai, Alaska, for disposal in the Class II injection well.

Attachments

- Attachment A: Figures
- Attachment B: Table
- Attachment C: Field Notes
- Attachment D: Photographs
- Attachment E: Data Quality Assessment Memorandum, ADEC Checklist, and Laboratory Data Package

Attachment A Figures

2021 Trenching and Flowline Installation Project Area

2-15 TS

SWANSON RIVER FIELD

KENAI NATIONAL WILDLIFE REFUGE

SWANSON RIVER UNIT

SOLDOTNA CREEK UNIT

1-27 TS

1-33 TS

1-4 TS

3-4 TS

1-9 TS

3-9 TS

Swanson River

Mink Creek

Main Gate

14 MI

13 MI

S008N010W

S008N009W

S007N010W

S007N009W

Sec. 1 Sec. 6 Sec. 5 Sec. 4 Sec. 3 Sec. 2 Sec. 1

Sec. 12 Sec. 8 Sec. 9 Sec. 10 Sec. 11 Sec. 12

Sec. 18 Sec. 17 Sec. 16 Sec. 15 Sec. 14 Sec. 13

Sec. 13

Sec. 24 Sec. 19 Sec. 20 Sec. 21 Sec. 22 Sec. 23 Sec. 24

Sec. 25 Sec. 30 Sec. 29 Sec. 28 Sec. 27 Sec. 26 Sec. 25

Sec. 31 Sec. 32 Sec. 33 Sec. 34 Sec. 35 Sec. 36

Sec. 36

Sec. 1 Sec. 6 Sec. 5 Sec. 4 Sec. 3 Sec. 2 Sec. 1

Sec. 12 Sec. 7 Sec. 8 Sec. 9 Sec. 10 Sec. 11 Sec. 12

Sec. 13 Sec. 18 Sec. 17 Sec. 16 Sec. 15 Sec. 14 Sec. 13

Sec. 24 Sec. 19

National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Hilcorp Alaska, LLC
3800 Centerpoint Dr. Ste.1400
Anchorage, AK 99503
Map Date: 9/29/2021

SWANSON RIVER FIELD
SRF 21-01
2021 Trenching and Flowline Installation Project Area

Legend
- Existing Pipelines
- Gravel Pads
- Oil and Gas Unit Boundaries

0 0.25 0.5 Miles

N

FIGURE:
1

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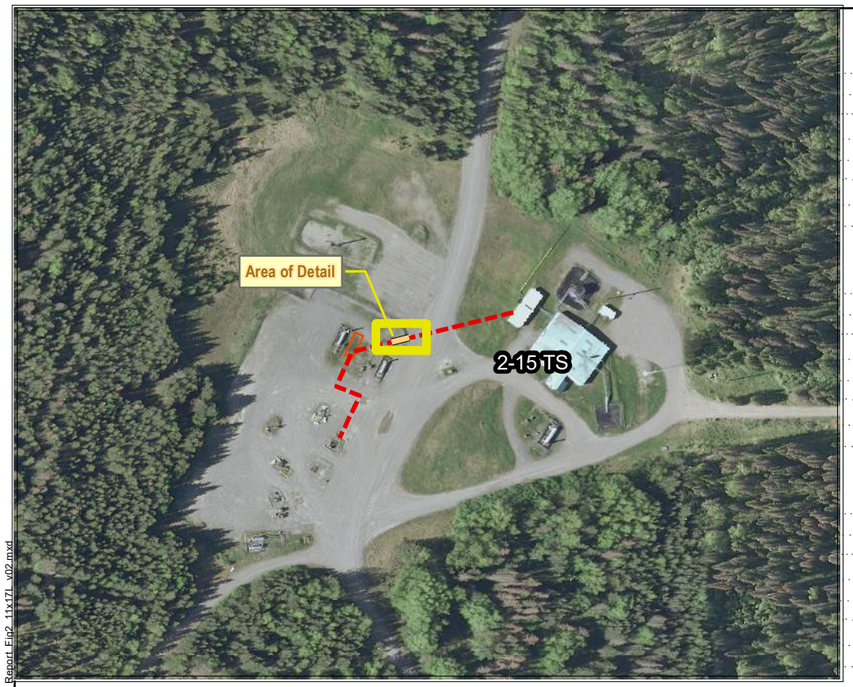
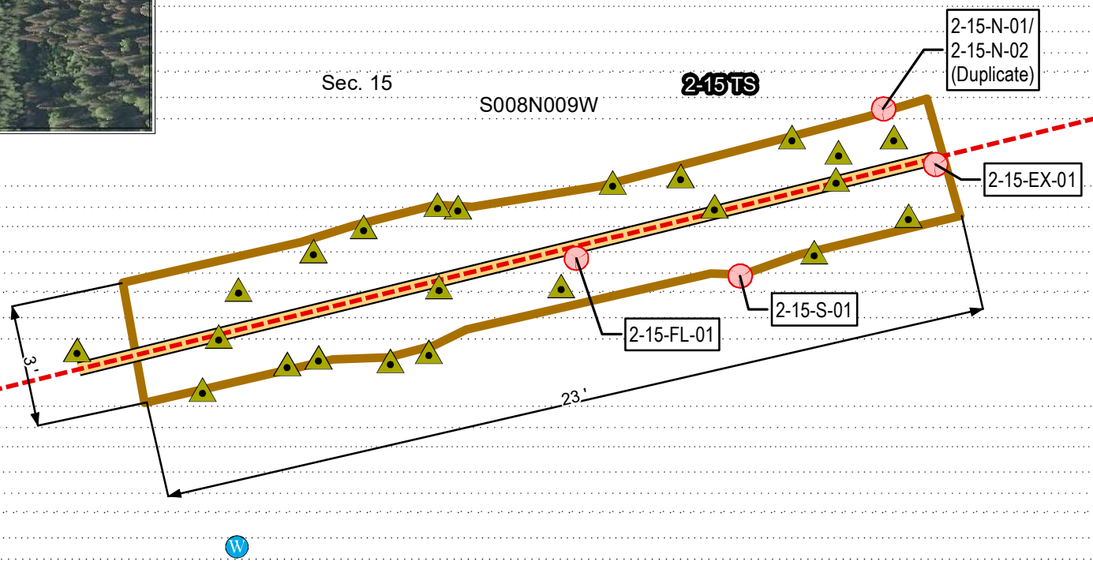


SRU 32-15

Sec. 15
S008N009W



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Hilcorp Alaska, LLC
3800 Centerpoint Dr. Ste.1400
Anchorage, AK 99503
Map Date: 9/29/2021

SRF 21-01
2021 Trenching and Flowline Installation
Analytical Results

Legend

- PID Screening Locations
- Soil Sample Locations
- Water Well
- Flowline Trench Installation
- Contaminated Section of Trench
- Trench Excavation Area

1 inch = 4 feet @ 11 x 17 page size

0 1 2 3 4 feet

N

FIGURE: 2

Attachment B Tables

Table 1 Field Screening Results
SRF 21-01

Location ID	Date	Result (ppm)	Analytical Sample ID
EX-01	7/28/2021	278.6	
EX-02	7/29/2021	2.7	
EX-03	7/29/2021	71.4	
EX-04	7/29/2021	3.2	
EX-01	7/30/2021	2,056	2-15-EX-01
EX-05	7/30/2021	0.8	
N01	8/3/2021	201.9	
N02	8/3/2021	4.9	
N03	8/3/2021	234.6	
N04	8/3/2021	1,098	
N05	8/3/2021	1,147	
N06	8/3/2021	6.8	
N07	8/3/2021	6	
N08	8/3/2021	1,166	
N09	8/3/2021	1,296	2-15-N-01 and 2-15-N-02 (duplicate)
S01	8/3/2021	615.2	
S02	8/3/2021	1,111	2-15-S-01
S03	8/3/2021	50.3	
S04	8/3/2021	214	
S05	8/3/2021	297.2	
S06	8/3/2021	795.9	
S07	8/3/2021	387.1	
S08	8/3/2021	10.7	
S09	8/3/2021	8.5	
FL01	8/3/2021	1.6	
FL02	8/3/2021	2.1	
FL03	8/3/2021	1,518	2-15-FL-01
FL04	8/3/2021	1,034	
FL05	8/3/2021	731	

Notes:
ID = identification
ppm = parts per million

Table 2 Soil Results Table TS2-15				Location	EX-01	N01		S01	FL03	Trip Blank
				Client Sample ID	2-15-EX-01	2-15-N-01	2-15-N-02	2-15-S-01	2-15-FL-01	Trip Blank
				Sample Type	Characterization	Primary	Duplicate	Primary	Primary	Trip Blank
				Collected Date	7/30/2021 1006	08/03/2021 07:45:00	08/03/2021 07:50:00	08/03/2021 08:40:00	08/03/2021 09:05:00	08/03/2021 07:45:00
Method	**Analyte**	**CAS**	**Units**	**PAL**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
6020B	*Arsenic*	7440-38-2	mg/kg	0.2	**10.4**	**10.1**	**12.2**	**16.7**	**10.1**	NA
	Barium	7440-39-3	mg/kg	20000	**194**	**159**	**167**	**195**	**136**	NA
	Cadmium	7440-43-9	mg/kg	9.1	**0.242**	**0.214 J**	**0.239**	**0.200 J**	**0.177 J**	NA
	Chromium	7440-47-3	mg/kg	100000	**35.8**	**38**	**39.1**	**40.8**	**29.7**	NA
	Lead	7439-92-1	mg/kg	400	**7.25**	**7.23**	**7.78**	**7.97**	**5.71**	NA
	Mercury	7439-97-6	mg/kg	0.36	0.172 U	0.168 U	0.172 U	0.161 U	0.158 U	NA
	Selenium	7782-49-2	mg/kg	6.9	1.15 U	1.12 U	1.15 U	1.07 U	1.05 U	NA
	Silver	7440-22-4	mg/kg	11	0.286 U	0.279 U	0.286 U	0.268 U	0.264 U	NA
8260D	*1,2,4-Trimethylbenzene*	95-63-6	µg/kg	610	**5160**	51.5 U	45.4 U	43.8 U	**10700**	25.3 U
	1,2-Dibromoethane	106-93-4	µg/kg	0.24	9.50 U	1.03 U	0.905 U	0.875 U	14.2 U	0.505 U
	1,2-Dichloroethane	107-06-2	µg/kg	5.5	19.0 U	2.06 U	1.81 U	1.75 U	28.3 U	1.01 U
	1,3,5-Trimethylbenzene	108-67-8	µg/kg	660	**832**	25.8 U	22.7 U	21.9 U	**1200**	12.7 U
	Benzene	71-43-2	µg/kg	22	119 U	12.9 U	11.4 U	10.9 U	177 U	6.35 U
	Ethylbenzene	100-41-4	µg/kg	130	**6010**	25.8 U	22.7 U	21.9 U	**2230**	12.7 U
	Isopropylbenzene	98-82-8	µg/kg	5600	**3100**	25.8 U	22.7 U	21.9 U	**1580**	12.7 U
	Methyl-tert-butyl ether (MTBE)	1634-04-4	µg/kg	400	950 U	103 U	90.5 U	87.5 U	1415 U	50.5 U
	Naphthalene	91-20-3	µg/kg	38	**13600**	**50.0 J**	**40.4 J**	**488**	**9030**	12.7 U
	Toluene	108-88-3	µg/kg	6700	238 U	25.8 U	22.7 U	21.9 U	354 U	12.7 U
	Xylene, Isomers m & p	179601-23-1	µg/kg	NA	**3120**	51.5 U	45.4 U	43.8 U	**1630**	25.3 U
	Xylenes	1330-20-7	µg/kg	1500	**3120**	77.5 U	68.0 U	65.5 U	**1920 J**	38.0 U
	n-Butylbenzene	104-51-8	µg/kg	20000	238 U	25.8 U	22.7 U	21.9 U	354 U	12.7 U
	o-Xylene	95-47-6	µg/kg	NA	238 U	25.8 U	22.7 U	21.9 U	**290 J**	12.7 U
	sec-Butylbenzene	135-98-8	µg/kg	28000	**2620**	25.8 U	22.7 U	21.9 U	**2010**	12.7 U
	tert-Butylbenzene	98-06-6	µg/kg	NA	**262 J**	25.8 U	22.7 U	21.9 U	**226 J**	12.7 U
8270DSIM	*1-Methylnaphthalene*	90-12-0	µg/kg	410	**56200**	14.6 U	14.7 U	**100**	**20200**	NA
	2-Methylnaphthalene	91-57-6	µg/kg	1300	**90000**	14.6 U	14.7 U	**126**	**28300**	NA
	Acenaphthene	83-32-9	µg/kg	37000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Acenaphthylene	208-96-8	µg/kg	18000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Anthracene	120-12-7	µg/kg	390000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Benzo(a)anthracene	56-55-3	µg/kg	700	2950 U	14.6 U	14.7 U	14.7 U	**113 J**	NA
	Benzo(a)pyrene	50-32-8	µg/kg	1500	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Benzo(b)fluoranthene	205-99-2	µg/kg	15000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Benzo(g,h,i)perylene	191-24-2	µg/kg	2300000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Benzo(k)fluoranthene	207-08-9	µg/kg	150000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Chrysene	218-01-9	µg/kg	600000	2950 U	14.6 U	14.7 U	**97.9**	**324**	NA
	Dibenzo(a,h)anthracene	53-70-3	µg/kg	1500	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Fluoranthene	206-44-0	µg/kg	590000	2950 U	14.6 U	14.7 U	**41.6**	**138 J**	NA
	Fluorene	86-73-7	µg/kg	36000	**4890 J**	**9.07 J**	**9.01 J**	**303**	**1150 J+**	NA
	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	15000	2950 U	14.6 U	14.7 U	14.7 U	70.5 U	NA
	Naphthalene	91-20-3	µg/kg	38	**34100**	**20.2 J**	**16.7 J**	**576**	**10600**	NA
	Phenanthrene	85-01-8	µg/kg	NA	**10200**	**20.1 J**	**17.0 J**	**567**	**2440 J+**	NA
	Pyrene	129-00-0	µg/kg	87000	2950 U	14.6 U	14.7 U	**44.5**	**139 J**	NA
AK101	*Gasoline Range Organics (C6-C10)*	GRO-C6-C10	mg/kg	300	**523**	**2.77 J B**	**1.85 J B**	**12.7**	**419 J+**	1.27 U
AK102	*Diesel Range Organics (C10-C25)*	DRO-C10-C25	mg/kg	250	**8690**	**61.7**	**61**	**1960**	**5910**	NA
AK103	*Residual Range Organics (C25-C36)*	RRO-C25-C36	mg/kg	10000	**3720**	**94.2 J**	**70.4 J**	**1250**	**2950**	NA

Notes

red highlight The analyte was detected at a concentration exceeding the PAL.

grey highlight The analyte was not detected; however, the LOD exceeds the PAL.

bold The analyte was detected.

CAS Chemical Abstract Service registry number

CALC Indicates the result was calculated by the validator following ADEC guidelines.

PAL project action limit

PALs are the most stringent of the 18 Alaska Administrative Code 75.341 Method Two Table B1/B2 Human Health and Migration to Groundwater Soil Cleanup Levels for the Under 40-Inch Zon

PAL for barium is the Human Health Soil Cleanup Level for the Under 40-Inch Zone

TAH total aromatic hydrocarbons

TAqH total aqueous hydrocarbons

QC quality control

NA not applicable / not analyzed

µg/kg micrograms per kilogram

mg/kg milligrams per kilogram

Data Qualifiers

J+ The quantitation is considered estimated, biased high, due to a QC anomaly.

B The result is considered estimated, biased high, and a potential false-positive detection, due to contamination

J The result is considered estimated, with an unknown direction of bias, either due to a QC anomaly (*validator-applied*) or detection below the LOQ (*laboratory-applied*).

U non-detect

Attachment C Field Notes

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

Name Susitna Environmental

Address

Phone 907 350 7952

Project

Clear Vinyl Protective Slipcovers (Item No. 30) are available for this style of notebook.
Helps protect your notebook from wear & tear. Contact your dealer or the J. L. Darling Corporation.

CONTENTS

PAGE	REFERENCE	DATE
	283 2534 David Brewer Lead Ops fill-in	
	Mike Car 52 (Jason) Alternate	
	Johnny ~~Car~~ Saltz - trench dig foreman	
	Mike Erstrom (Construction main lead) merstrom@hilcorp.com	

7/19/2021 - SRF 21-01 trenching

→ Arrived @ SRF @ 10pm 7/18

0600 Tailgate Meeting w/CCI
0700 Meet CCI @ TS-215
0830 CCI Start hand digging @ TS 2-15
1015 Calibrate YSI
Fresh Air = 0.0ppm Iso = 99.9ppm
Bump = 100.1 ppm
1130 Break for lunch
1200 recommence potholing w/ vac truck
1500 Visit SCU 21B-16 + SCU 23B-03 to determine water levels.
1730 Stop potholing, Stage equip for day.
1800 End of Day

M. Mayo
7/19/21

7/20/20 SRF 21-01 trenching

0600 Tailgate meeting w/CCI
- Will start excavating w/mini-ex today
- MM rvn to Kenai to pick up equip @ Hilcorp hangar
- Also pick up supplies @ KGF if they're available.

0624 Depart SRF
0725 Arrive Kenai hangar
- Called J. Coston regarding mild cold symptoms. He recommended a Covid test.
- Contacted Odyessy in Kenai for a test

0815 Appt @ Odyssey fr Covid test - Should have results in the morning.
0852 Call J. Coston - approved to work Solo today.
1130 Prep for gw sampling @ SCU 312-09.
* See 2020 Drilling Book #2 for details *
1930 End of Day

M. Mayo
7/20/21

7/21/2021 SRF ~~20-21~~ 21-01 trenching

0615 Call David Brewer to check in.
- He asked me to call Mike @ 2570 regarding dewatering @ SCU 21B-16.

0622 Talk w/ Mike (Car 52)
- Keep volume log for dewatering
  - will be handing log into Lead Ops when done.
- Gave him AFE #'s
- They will keep pumping @ SCU 21B-16 today. Once we're ready to sample, I will have them pump SCU 23B-03 which doesn't have much water and A+L will come in to help w/ the sampling there first.

0800 Stop @ SCU 23B-03 - See 2020 Drilling Program field book #2.

0830 Work @ Birch House

1000 Covid result reported negative.
- emailed KN + J. Coston results.

→ See day's activities in Drilling Book #2.

M. Mayer
7/21/2021

7/22/2021 SRF ~~20-21~~ 21-01 trenching

0600 Tailgate meeting w/ CCI trenching crew.

0645 Check on SCU 21B-16 water level - it's ~ 10-12" below top of wellhead.

0700 Arrive @ SRF ~~20-21~~ 21-01. Status:
- ~ 5.5 feet dug outside of TS 2-15 bldg and about 2-3' inside w/ piping exposed.
- ~ 15 feet trench dug @ near water well loc @ SRU 32-15
- Approx 5 cy of material has been ~~remove~~ stockpiled - no odor or staining of soil observed.
- No sheen on surf water or rain water in ~~exca~~ trenches.
- & no staining or odor observed on trench floors or sidewalls

1310 Susitna depart TS 2-15

1325 Stop @ Pad 23-22 - no stockpiles except for 1.5-2 cy uncovered pile.

1344 MM depart SRF to pick up N. Crone.

1450 Arrive at hangar to pick up

7/22/21 SRF 21-01 trenching

up M. Crone
- pack Samples and TTI rentals to Ship back to Anc ~~of~~ on 7/23 - will be picked up and delivered by T. Kocinski.

~~1708~~ 1645 Arrive back @ SRF 21-01 trenching location.
- no observation of impacted soil or water.

1708 23B-22 Stockpiles still in place - Sent photos to K Nixon.

1720 Stop by SCU 21B-16 - water level much lower, but quite a bit more to remove

1745 Back to Birch House

1815 End of Day

M. Mayer
7/22/21

7/23/2021 SRF 21-01 trenching

0600 Tailgate meeting W/CCI
- Will provide the waste management plan and BLM COA to J. Saltz for review.

0700 get team setup for soil sampling @ SCU 21B-16 (see 2020 Contam. Sites field book.

0930 Arrive @ TS 2-15 for trenching activities.

0946 Call W/ Tyler Little
- 3 stockpiles remain @ 23B-22
  - KN is looking for data
- 2020 drilling waste still at SRF G+I facility.
  - KN has DEC transport forms for those
  - Tyler will work W/Chuck to determine if they can go to Class II Well
- 21B-16 still has a stockpile
  - mm will review/resend info to T. Little + C. Wheat.

1327 Call will K Nixon
- 23B-22 Stockpiles will be managed by Bruce and sent

7/23/2021 SRF 21-01 trenching

to STT for treatment.
- Trenching crew foreman is responsible for making spill notification if contamination is encountered.

1724 Depart TS 2-15
- demob
- sample control

1806 Depart SRF
1915 Arrive @ Kenai Airport to checks bags/Cooler.
2115 Depart Kenai
2145 Arrive Anchorage
2200 End of day

M. May
7/23/21

7/26/2021 SRF 21-01 trenching

0500 Arrive at Anchorage airport.
0800 Arrive at Swanson River Fiel
0815 Sign in at office, Head to Birch House to get equipment + ga
0830 Get radio and water from lead ops.
0900 Talk to J. Saltz and sig on permit. Discuss trenching progr Trench is advanced to the road o TS 2-15 side.
0930 Inspect trench. No sheen on a small amount of pooled water in bott of excavation. New stock pile materi no visible staining in stock pile. Look clean
1600 Discuss progress with J. Saltz (CC Excavation advanced ~ 10 feet furth towards roadway. Gravel pad mate is like concrete. Towards end of th day wetter material is easier to exca
1730 Daily report
1830 End of day

Helen Coone
7/26/21

7/27/2021 SRF 21-01 trenching

0600 Tailgate meeting W/CCI N. Crone (Jason) Car 52 for fencing + dewatering QEP

0630 Talk to lead ops to get fencing and netting put back up at 21B-16 and 23B-03. Jason (Car 52) is tracking down volumes from dewatering of excavations on 7/22 + 7/23

0700 Trenching excavation underway.

0900 Inspect trenching area. No contamination visible and No odor. No contamination evidence in stockpile material

1400 Fencing replaced at 23B-03 and 21B-16. Birdnet was damaged and not put back on yet

1415 Supersacks behind HOA are covered with 6 mil liner and on 0mil liner containment.

1420 Volumes for dewatering

7/20	21B-16	- 210 bbl	no sheen, no oil
7/21	21B-16	- 350 bbl	no sheen, no oil
7/21	23B-03	- 70 bbl	sheen, no oil
7/22	21B-16	- 490 bbl	no sheen, no oil
7/23	21B-16	- 320 bbl	no sheen, no oil

1800 End of day — Nelson N. Crone 7/27/21

7/28/2021 SRF 21-01 trenching

0600 Tailgate meeting w/ CCI N. Crone QEP

New personnel has arrived with 2 more supersuckers and air knifes.

0640 Trench location has moved somewhat. Dig section was re-routed after trench was already dug. Now there will be 2 90° bends going into the heater unit instead of a straight shot.

1300 Calibrate PID sn; 592-601110

zero ppm : 0.0 ppm

Isobutylene 100ppm : 99.8 ppm

bump : 99.7 ppm

1345 Approx. 8 ft from roadway near heater grey stained soil was encountered @ 3.5 bgs. Crew stopped excavating and supersucker was emptied. No apparent contamination was observed in supersucker stockpile. Screening sample was collected from excavation using a shovel EX-01.

PID EX-01 = 278.6 ppm

1410 Screening sample of stockpile SP-01.

PID SP-01 = 2.1 ppm

7/28/2021 SRF 21-01 trenching

1505 Call with Kelley Nixon to discuss contamination finding. Recommend to contact lead ops to further investigate if spill is active from nearby infrastructure.
1510 Lead ops (Bruce) is coming to look at site.
1530 approx. 8 cy additional stakpile material next to trench on 32-15 side. approx 7 cy stockpile soil additionally on TS2-15 side
1600 Lead ops arrives, discuss contamination finding. Contamination is likely historical. We will stop excavating for today and get super-sacks. Contaminated soil will be excavated in a limited capacity to continue the trenching, placed in supersacks, and staged on liner. They will be covered with liner to prevent rainwater from contacting contaminated soil. QEP N. Crone will

7/28/2021 SRF 21-01 Trenching

and Mike Erstrom, Kelley Nixon
They will notify agencies as requir
ADEC and USFWS.
1700 No contaminated soil has been excavated at this time.
1710 Trench where contamination is found is covered with liner over
1730 Depart site for Birch house
1748 Fuel truck
1800 Daily report
1830 End of Day

Melon N. Crone
7/28/21

7/29/2021 SRF 21-01 trenching

0600 CCI safety meeting N. Crone QEP
- protecting trenches at night w/ barriers
- proper ppe for various jobs

CCI plan to bring in dragon boxes and excavate contaminated soil within a limited area of the trench.

0640 Calibrate PID sn:592-601110
Zero ppm : 0.0 ppm
100ppm isobutylene: 99.8 ppm
bump : 99.1 ppm

0800 Inspect stockpiles for visual signs of contamination.

0845 Call with Kelley Nixon advised to trench through the contaminated soil as detailed in the CSWMP. It is an active production facility so document + sample as QEP sees neccesary for data to go to agencies.

0915 Mike Erstrom (Hilcorp Construction) advise we continue trenching through contaminated soil. Segregate clean and cataminated dirt.

1000 Inspect stockpiles on the ground. No contamination present. Excavation continues.

7/29/2021 SRF 21-01 trenching

1415 Head to Birch house to send emails and coordinate transportation for Friday.

1530 Arrive back at site. Tank and supersucker set up for contaminated soil excavation

1545 Begin excavating contaminated soil

1623 Collect screening EX-02 from 1.5' bgs

1628 Collect screening from stockpile SP-02

1630 Contaminated grey soil encountered in a distinct layer below 24" inches

1640 Bottom of test hole 48" inches

1644 PID results
EX-02 - 2.7 ppm - 18" bgs
SP-02 - 2.6 ppm - surface - ~~6"~~
EX-03 - 71.4 ppm - 30" bgs

1650 Collect screening from 30 inches bgs ~~down~~ EX-03

1745 Collect screening from 28 inches bgs EX-04 PID result - 3.2 ppm

1755 Cover excavation with liner

1758 Depart site for Birch house

1800 End of Day — Nolan W. Crone 7/29/21

7/30/21 SRF 21-01 trenching

0600 CCI safety meeting w/ CCI. N. Crone QEP

0636 Calibrate PID SN: 592-601110
zero ppm: 0.0 ppm
100 isobutylenene: 99.8 ppm
bump: 101.5 ppm

0700 Begin excavation into roadway and contamination area.

0740 Clay layer is very difficult to dig by hand. Use mini ex to break up clay and keep material in bottom of excavation. Supersucker will extract it.

1006 Collect sample SS-15-EX-01 from sidewall of trench 36" bgs.

SS-15-EX-01 PID - 2056 ppm

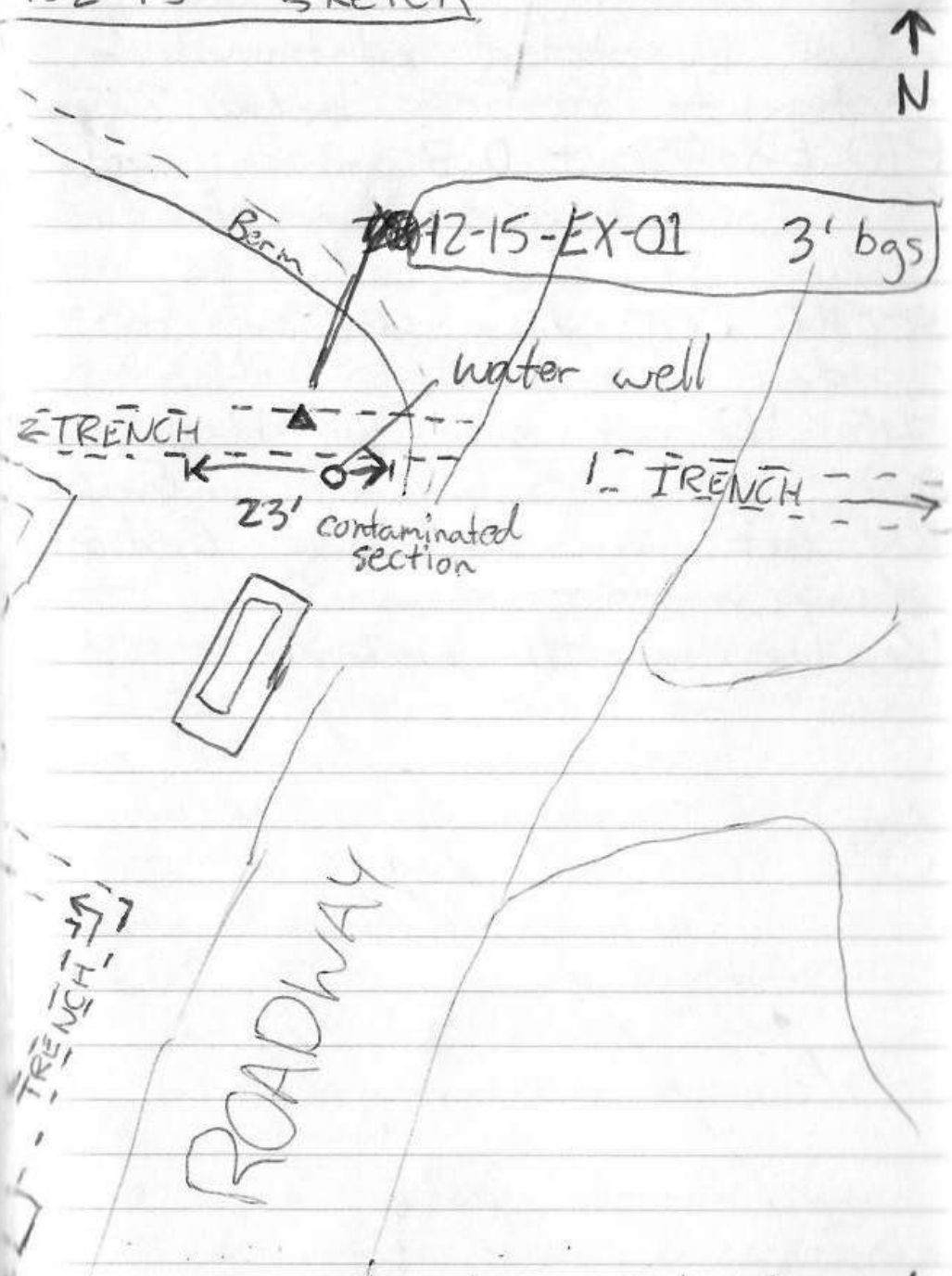
1300 2 dragon boxes filled with contaminated soil. Each box is 3.5 cy. Additional material will be staged on 10mil liner and placed in drums.

1320 Welders lay a section of pipe in the first part on trench, uncontaminated section.

1553 Excavate remaining contaminated soil from trench section and place

7/30/21 SRF 21-01 trenching

TS2-15 sketch



7/30/21 SRF 21-01 trenching

1554 Collect PID screening at end of suspected contaminated section to confirm below 20ppm PID EX-05 - 0.8 ppm

1653 Continue excavating remaining section of the roadway

1712 CCI done digging for the day.

1715 Depart site for Birch house

1800 Depart Swanson River Field

2200 Arrive in Anchorage. End of day.

No work over the weekend.

Kelsen W. Crane

8/2/21 SRF 21-01 trenching

0500 Depart Anchorage. Drive to Swanson River Field. (SRF)

0815 Arrive at SRF. Sign in at office. Get radio. Fuel truck.

0845 Arrive on site at 12-15. Sign on permit.

0900 Talk to J. Saltz. No additional contaminated soil areas encountered. CCI dug a small amount more in contaminated area and place on liner. Total contaminated dirt removed approx. 12 cy. 7cy are staged in the dragon boxes and 5cy are staged on the liner.

1000 Go back to Birch house. Send gps data to Hilcorp. They will plot it on a figure for decision making and potentially the agencies.

1230 Call with Kelley Nixon. She'll work on what we want to sample at the site

1730 Work concludes for the day.

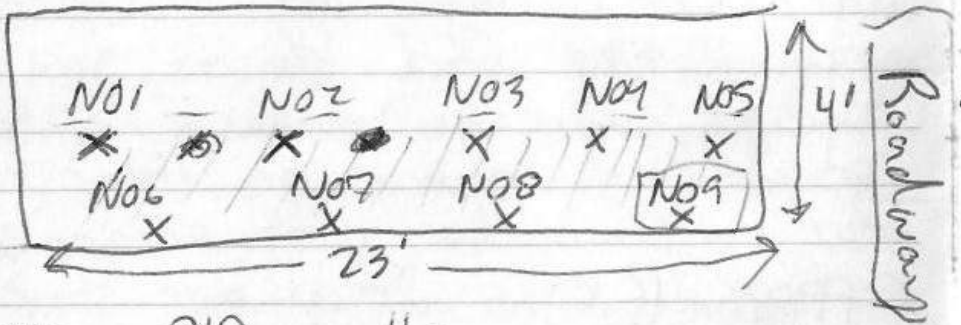
1735 Depart for Birch house. Finish paper work

1800 End of day

Kelsen W. Crane 8/2/21

8/3/21 SRF 21-01 Trenching

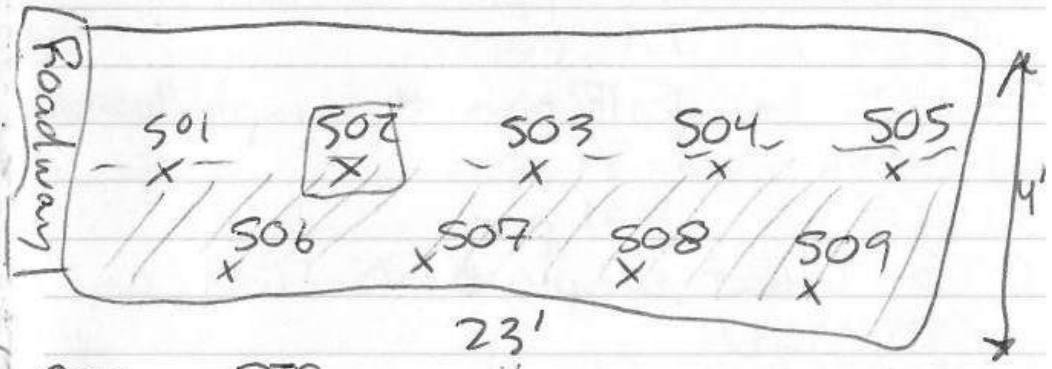
0600 Safety meeting w/ CCI.
0630 Arrive at site
0635 Calibrate PID SN:592-601110
Zero : 0.0 ppm
100ppm isobutylene: 99.8 ppm
bump : 100.7 ppm
0650 North sidewall 92 sq. ft.



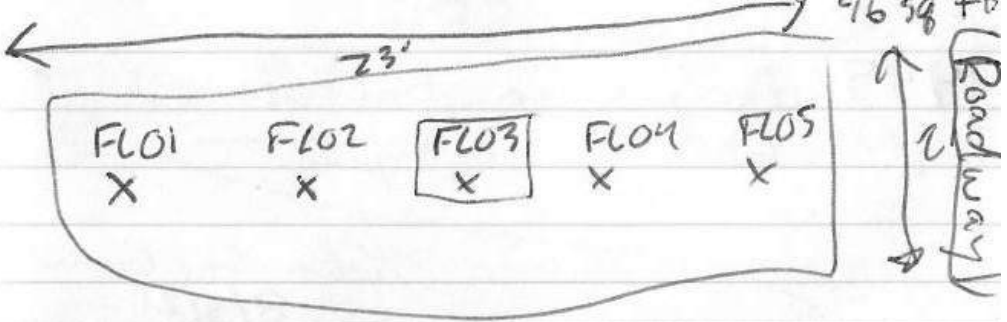
0730 PID results
N01 - 201.9 ppm
N02 - 4.9 ppm
N03 - 234.6 ppm
N04 - 1098. ppm
N05 - 1147 ppm
N06 - 6.8 ppm
N07 - 6.0 ppm
N08 - 1166 ppm
N09 - 1296 ppm * sample location
0745 Collect sample 2-15-N-01
and duplicate 2-15-N-02
Duplicate collected at 0750.

8/3/21 SRF 21-01 Trenching

0750 South sidewall 92 sq. ft.



820 PID results
S01 - 615.2 ppm
S02 - 1111 ppm * sample location
S03 - 50.3 ppm
S04 - 214.0 ppm
S05 - 297.2 ppm
S06 - 795.9 ppm
S07 - 387.1 ppm
S08 - 10.7 ppm
S09 - 8.5 ppm
840 Collect sample 2-15-S-01
845 Floor sketch



8/3/21 SRF 21-01 Trenching

0900 PID results for Floor
FL01 - 1.6 ppm
FL02 2.1 ppm
FL03 - 1518 ppm * sample location
FL04 1034 ppm
FL05 731 ppm
0905 Collect sample 21-15-FL-01 and MS/MSD.
0915 Collect GPS locations for screening and sample locations.
1030 Go to Birch house to manage samples and fill out CoC.
1300 Call with Kelley Nixon. Confirmed backfilling of contaminated section of trench can proceed.
1500 Talk to Jonny Saltz. Tell him he can backfill contaminated section of trench. Depart site.
1530 Return radio and sign out of SRF
1545 Depart SRF
1945 Arrive in Anchorage
2000 End of day →

Melvin W. Crowe
8/3/21

Attachment D Photographs

TS 2-15 section from building to roadway. Facing Northeast.

Contaminated section of trench between roadway and water well. Containerizing presumed POL contaminated soil into dragon boxes using a supersucker. Facing southeast.

Excavating with excavator to break up hard clay layer in contaminated soil section of trench. Facing West.

Contamination showing in soil; grey stained layer in the excavation trench. Facing Northeast.

Attachment E Data Quality Memorandum, ADEC Checklists, and Laboratory Data Packages

Arctic Data Services

250 Cushman St. Ste. 3D
Fairbanks, AK 99701
907-457-3147

Date:	9/22/2021
Project name:	Hilcorp SRF 21-01 Trenching
Laboratory:	SGS North America, Inc. – Anchorage, AK (SGSA)
Sample Delivery Groups:	1214864
Reviewed by:	Alex Thompson
Title:	Chemist
Approved by:	Rodney Guritz
Title:	Principal Chemist

To: Ms. Melissa Mayer
Susitna Environmental, LLC
2419 McKenzie Drive
Anchorage, AK 99517

Data Quality Assessment

This letter summarizes the findings of a data quality assessment (DQA) conducted by Arctic Data Services, LLC (ADS) on behalf of Susitna Environmental, LLC (Susitna) for the above-referenced project data. Precision, accuracy, sensitivity, representativeness, comparability, and completeness of the data were evaluated by reviewing laboratory-supplied quality assurance/quality control (QA/QC) information as well as conducting independent QC checks on the data. Stage 2A validation was conducted in general accordance with the *ADS Standard Operating Procedure for Stage 2A Data Validation v1.1* (2019). Stage 2A validation includes reviewing sample handling, custody, and sample-batch level QC information and applying data qualifiers to sample results affected by anomalies and QC failures and summarizing the impacts to data quality. Instrument-level QC information was not reviewed. This validation meets the requirements of the Alaska Department of Environmental Conservation (ADEC) *Technical Memorandum on Data Quality Objectives, Checklists, Quality Assurance Requirements for Laboratory Data, and Sample Handling* (March 2017). In the absence of project-specific control limits or measurement quality objectives (MQOs), QC-sample recoveries and relative percent differences (RPDs) were compared to laboratory control limits. Field-duplicate RPDs were compared to ADEC-recommended MQOs. To evaluate analytical sensitivity, limits of quantitation (LOQs) and limits of detection (LODs) were compared to the following project action limits (PALs): 18 Alaska Administrative Code (AAC) 75.341 Table B1/B2 human health and migration to groundwater soil cleanup levels (SCLs) for the under 40-inch zone.

An ADEC laboratory data review checklist was completed for the single sample delivery group (SDG) and is attached to this DQA. Also attached is a tabular summary of data qualified during the course of this review (Table 1), and a table listing non-detect results lacking adequate analytical sensitivity (Table 2). The following sections provide a summary of the findings for each QA/QC element reviewed; anomalies that had no impact to data quality are discussed in the checklist and are not further described herein.

Sample Analysis Summary

Analytical results for four soil samples (including a QC field duplicate) were reviewed. The samples were submitted in a single SDG to SGSA for analysis of one or more of the following:

- Gasoline range organics (GRO) by Alaska Method AK101;
- Diesel range organics (DRO) by Alaska Method AK102;
- Residual range organics (RRO) by Alaska Method AK103;
- Resource Conservation and Recovery Act (RCRA) metals by EPA SW846 Method 6020B;
- Polycyclic aromatic hydrocarbons (PAHs) by EPA SW846 Method 8270D with selected ion monitoring (SIM);
- Petroleum-related volatile organic compounds (VOCs) by EPA SW846 Method 8260D.

Sample Preservation, Handling, Custody, and Holding Times

Sample receipt forms (SRFs) were reviewed to check that samples were received in good condition, properly preserved, and within the required temperature range. Chain of custody (COC) forms were reviewed to confirm that custody was not breached during sample handling. Dates of sample collection, preparation, and analysis were compared to check that method holding times were not exceeded.

There were no sample preservation, handling, custody, or holding time failures affecting project-sample data quality.

Analytical Sensitivity

Analytical sensitivity was evaluated by checking that LOQs and LODs were below relevant PALs where target analytes were not detected.

Non-detect results for a number of VOC analytes had LODs and/or LOQs exceeding the relevant PALs. Refer to Table 2 (attached) for a full list of results lacking adequate analytical sensitivity. All 1,2-dibromomethane (EDB) results were non-detect with LODs exceeding the most stringent PAL; however, this analyte is not a contaminant of potential concern (COPC) for the contaminated site. Data quality is not affected by poor sensitivity, however, non-detect results with LODs that exceed the PAL cannot be used to rule out the potential presence of the analyte at concentrations above the PAL for the sampled location.

Method Blanks

The laboratory analyzed and reported a method blank (MB) for each preparatory batch, to check for laboratory-based sample contamination. Associated project-sample results were considered affected where the analyte was

detected within 10 times the MB concentration. Results affected by blank contamination are qualified as estimated and flagged 'B', indicating a high bias and potential false-positive detection.

The following MB detections were determined to affect project-sample data quality:

- **1214864.** GRO was detected below the LOQ in the method blank sample associated with AK101 preparatory batch VXX37618. Two GRO results were considered affected and qualified, following the procedure outlined above. The impact to data usability was minimal, as all affected results are below relevant cleanup levels, despite the potential high bias. Refer to Table 1 for a full list of affected results.

Trip Blanks

Trip blank samples (TBs) were submitted alongside volatile organic analysis samples and analyzed for GRO and VOCs, to check for cross-contamination of samples during sampling, shipment, or storage. Associated project-sample results would be considered affected where the analyte was detected within 10 times the TB concentration.

There were no trip blank detections affecting project-sample data quality.

Laboratory Control Samples

The laboratory analyzed and reported laboratory control samples (LCSs) for each preparatory batch, to assess laboratory extraction efficiency and analytical accuracy. In some cases, LCS duplicates (LCSDs) were used to assess analytical precision. LCS and LCSD recovery information and LCS/LCSD RPD information (where available) were reviewed.

There were no LCS/LCSD recovery or RPD failures affecting project-sample data quality.

Matrix Spike Samples

Matrix spikes (MS) and MS duplicates (MSD) were analyzed for organic batches, to evaluate potential matrix interference affecting accuracy and/or precision. MS/MSD recovery and RPDs were evaluated only if the parent sample (the sample spiked for the MS/MSD) was in the project-sample set. MS/MSD recovery was only evaluated if the spiking concentration was greater than the native analyte concentration.

There were no MS/MSD recovery failures affecting project-sample data quality. Refer to the checklist for further discussion.

Surrogate Recovery

Samples submitted for analysis of organic compounds were spiked with analyte surrogates to evaluate extraction efficiency and to check for matrix interference. Surrogate recoveries were reviewed for each project sample and analysis. Surrogate recovery failures are only considered to affect project results for samples that are not heavily diluted (dilution factor < 10).

The following surrogate recovery failures were determined to affect project-sample data quality:

- **1214733.** The AK101 surrogate, 4-bromofluorobenzene (4-BFB), as well as the 8270DSIM surrogate, 2-methylnaphthalene-d10, were recovered above laboratory control limits in sample 2-15-FL-01. Fluorene, phenanthrene, and GRO results for this sample were considered affected. Affected results are qualified as estimated and flagged 'J+', indicating a high bias. The impact to data usability is minimal for affected 2-15-FL-01 results, as concentrations of other petroleum related analytes (not affected by QC failures) in the sample exceed the most stringent applicable cleanup levels.

Field Duplicates

One field duplicate sample pair was collected and submitted, meeting the 10% minimum required frequency. RPDs between field-duplicate results were calculated where at least one of the results was quantitatively detected (above the LOQ). In the case that one result was not detected, RPDs were calculated using the LOD for the non-detect result. RPDs were compared to the ADEC recommended MQO of 50% for soil samples.

There were no field duplicate sample pair RPD failures affecting project-sample data quality.

Summary of Data Quality Indicators

The following sections summarize the findings of the above review with respect to the six data quality indicators: sensitivity, precision, accuracy, representativeness, comparability, and completeness. Note that this evaluation of representativeness, comparability, and completeness is limited to consideration of analytical data quality only. Assessment of data usability in the context of the project must be conducted by the project team as a whole, taking into account the data quality issues summarized herein, as well as overall project objectives.

Sensitivity

Sensitivity describes the ability of the sampling and analytical methodology to meet detection and/or quantitation limit objectives. Only ten results (including all EDB results) had LODs or LOQs exceeding relevant PALs; refer to Table 2 for a full list of results lacking adequate analytical sensitivity. As stated above, these results cannot be used to rule out the potential presence of the analyte at concentrations exceeding the cleanup level. Overall sensitivity was deemed acceptable for the purposes of this project, with the noted exceptions considered.

Precision

Precision is a measure of the reproducibility of repetitive measurements. Precision was evaluated based on laboratory QC-sample and field-duplicate sample RPDs. There were no laboratory QC sample duplicate or field sample duplicate pair RPD failures affecting project-sample data quality. Overall precision was deemed acceptable.

Accuracy

Accuracy is a measure of the correctness, or the closeness, between the true value and the quantity detected. Accuracy was evaluated based on analyte recoveries for laboratory QC samples and recovery of surrogate spikes for project samples. Sample handling and preservation anomalies that may have impacted data accuracy are also taken into consideration.

No sample handling and preservation anomalies affected project data for the submitted SDG. Laboratory QC-sample recovery indicated generally adequate analytical accuracy. However, one GRO result, and two PAH analyte results were affected by high surrogate recovery failures, and two GRO results were affected by laboratory-based contamination, as identified by detections in an associated method blank sample. These results are qualified as estimated, and a direction of bias given, where discernible. Results affected by contamination and qualified 'B', may be potential false-positive detections. The impact to data usability for these results was minimal in all cases, and overall accuracy is deemed acceptable.

Representativeness

Representativeness describes the degree to which data accurately and precisely represent site characteristics. Representativeness is affected by factors such as sample frequency and matrix or contaminant heterogeneity, as well as analytical performance (including sensitivity, accuracy, and precision) and sample cross-contamination.

Samples were collected in accordance with an approved work plan. Two results were qualified due to laboratory-based contamination. These results are qualified as estimated, biased high, and may be false-positive detections. Additionally, three results were affected by high surrogate recovery failures. These results are qualified as estimated, biased high. Results affected by QC anomalies affecting accuracy should not be considered as wholly representative of site conditions. However, impact to data usability was generally minor and the results are usable as qualified. Overall representativeness is deemed acceptable for the purposes of this project, with the exceptions described above taken into account.

Comparability

Comparability describes whether two data sets can be considered equivalent with respect to project goals. Comparability is affected by factors such as sampling methodology and analytical performance (including sensitivity, accuracy, and precision). Comparability was evaluated by checking that standard analytical methods were employed, and analytical performance was acceptable. Data review findings generally support that the dataset is comparable; however, comparability should be evaluated by the project team considering sample collection methodology and historic results alongside data quality and analytical methodology.

Completeness

Completeness describes the amount of valid data obtained from the sampling event. It is calculated as the percentage of usable measurements compared to the total number of measurements. The soil dataset is 100% complete, with no results rejected in the course of this review.

Conclusions and Limitations

Sensitivity, precision, accuracy, representativeness, comparability, and completeness were deemed acceptable, and the data are usable for the purposes of this project. Project sample results affected by the QC anomalies described above have been flagged accordingly (Table 1). A list of non-detect results lacking adequate analytical sensitivity is provided as Table 2.

This review was based solely on information provided by the analytical laboratory in the laboratory reports for the SDG reviewed. ADS did not review instrument-level QC elements, such as calibration verification or internal standard response, except to the extent that the laboratory identified instrument-level anomalies in the case narrative. ADS did not conduct independent validation of the data (e.g. recalculating results based on instrument responses) or review any raw chemical data (e.g. chromatograms). A data quality assessment helps reduce the risk of reliance on data of compromised quality, however, it does not eliminate that risk.

Attachments:

Table 1	Summary of Qualified Data
Table 2	Analytical Sensitivity Summary
ADEC Laboratory Data Review Checklists:	1214864

Table 1
Summary of Qualified Data
SRF 21-01 Trenching
Data Quality Assessment

Arctic Data Services, LLC

Client Sample ID	Lab Sample ID	Matrix	Method	Analyte	CAS	Units	DL	LOD	LOQ	Result	Lab Flags	QC Flags	Note	Final Qualified Result
2-15-N-01	1214864001	Soil	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	mg/kg	1.55	2.58	5.15	2.77	J	B	MB	2.77 J B
2-15-N-02	1214864002	Soil	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	mg/kg	1.36	2.27	4.54	1.85	J	B	MB	1.85 J B
2-15-FL-01	1214864004	Soil	8270DSIM	Fluorene	86-73-7	µg/kg	35.3	70.5	141	1150		J+	SUR_%R	1150 J+
2-15-FL-01	1214864004	Soil	8270DSIM	Phenanthrene	85-01-8	µg/kg	35.3	70.5	141	2440		J+	SUR_%R	2440 J+
2-15-FL-01	1214864004	Soil	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	mg/kg	5.30	8.85	17.7	419		J+	SUR_%R	419 J+

Notes

SUR_%R Surrogate recovery failure
MB Method Blank Detection

Data Qualifiers

J+ The result is considered estimated, biased high, due to a QC anomaly.
B The result is considered estimated, biased high, and a potential false-positive detection, due to contamination.
J The result is considered estimated, with an unknown direction of bias, either due to a QC anomaly (*validator-applied*) or detection below the LOQ (*laboratory-applied*).

Definitions

CAS Chemical Abstract Service registry number
DL detection limit
LOD limit of detection
LOQ limit of quantitation
QC quality control
NA not applicable
RPD relative percent difference
U non-detect
µg/kg micrograms per kilogram
mg/kg milligrams per kilogram

Table 2
Analytical Sensitivity Summary
Hilcorp SRF 21-01 Trenching
Data Quality Assessment

Client Sample ID	Lab Sample ID	Matrix	Medium	Method	Analyte	CAS	Units	DL		LOD		LOQ		PAL	PAL Source
2-15-N-01	1214864001	Soil	Solid	8260D	1,2-Dibromoethane	106-93-4	mg/kg	0.000824	*	0.00103	*	0.00206	*	0.00024	ADEC MTG SCL
2-15-N-01	1214864001	Soil	Solid	8260D	Benzene	71-43-2	mg/kg	0.00804		0.0129		0.0258	*	0.022	ADEC MTG SCL
2-15-N-02	1214864002	Soil	Solid	8260D	1,2-Dibromoethane	106-93-4	mg/kg	0.000726	*	0.000905	*	0.00181	*	0.00024	ADEC MTG SCL
2-15-N-02	1214864002	Soil	Solid	8260D	Benzene	71-43-2	mg/kg	0.00708		0.0114		0.0227	*	0.022	ADEC MTG SCL
2-15-S-01	1214864003	Soil	Solid	8260D	1,2-Dibromoethane	106-93-4	mg/kg	0.000701	*	0.000875	*	0.00175	*	0.00024	ADEC MTG SCL
2-15-FL-01	1214864004	Soil	Solid	8260D	1,2-Dibromoethane	106-93-4	mg/kg	0.0113	*	0.0142	*	0.0283	*	0.00024	ADEC MTG SCL
2-15-FL-01	1214864004	Soil	Solid	8260D	1,2-Dichloroethane	107-06-2	mg/kg	0.0198	*	0.0283	*	0.0566	*	0.0055	ADEC MTG SCL
2-15-FL-01	1214864004	Soil	Solid	8260D	Benzene	71-43-2	mg/kg	0.11	*	0.177	*	0.353	*	0.022	ADEC MTG SCL
2-15-FL-01	1214864004	Soil	Solid	8260D	Methyl-tert-butyl ether (MTBE)	1634-04-4	mg/kg	0.877	*	1.415	*	2.83	*	0.4	ADEC MTG SCL
Trip Blank	1214864007	Soil	Solid	8260D	1,2-Dibromoethane	106-93-4	mg/kg	0.000405	*	0.000505	*	0.00101	*	0.00024	ADEC MTG SCL

Definitions

CAS	Chemical Abstract Service registry number
DL	detection limit
LOD	limit of detection
LOQ	limit of quantitation
PAL	project action limit
ADEC MTG SCL	Alaska Department of Environmental Conservation 18 Alaska Administrative Code 75.341 Method Two Table B1/B2 Migration to Groundwater Soil Cleanup Level
mg/kg	milligrams per kilogram
*	Denotes a limit exceeds the PAL

Laboratory Data Review Checklist

Completed By:

Alexander Thompson

Title:

Chemist

Date:

September 8th, 2021

Consultant Firm:

Arctic Data Services, LLC for Susitna Environmental, LLC

Laboratory Name:

SGS North America, Inc. – Anchorage, AK

Laboratory Report Number:

1214864

Laboratory Report Date:

August 20th, 2021

CS Site Name:

Hilcorp TS2-15 Trenching Investigation

ADEC File Number:

NA

Hazard Identification Number:

NA

Note: Any N/A or No box checked must have an explanation in the comments box.

1. Laboratory

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

   Yes☒ No☐ N/A☐ Comments:

   All samples were received and analyzed by SGS North America, Inc. in Anchorage, AK, which is ADEC CS approved for the analyses performed.

   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☐ N/A☒ Comments:

   No samples were transferred to another laboratory

2. Chain of Custody (CoC)

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

   Yes☒ No☐ N/A☐ Comments:

   b. Correct analyses requested?

   Yes☐ No☒ N/A☐ Comments:

   The COC requested analysis of DRO/RRO, PAHs, RCRA metals, GRO, and petroleum related VOCs, but does not request specific analytical methods for the requested analytes. The laboratory performed appropriate analytical methods; Alaska Methods (AK101/102/103) for petroleum hydrocarbons, EPA SW846 8260D for VOCs, 8270DSIM for PAHs, and 6020B for RCRA metals.
   Additionally, the trip blank sample was not listed on the COC and no analyses were requested for the sample. The laboratory analyzed the trip blank for GRO and VOCs using appropriate analytical methods.

3. Laboratory Sample Receipt Documentation

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

   Yes☒ No☐ N/A☐ Comments:

   Samples were hand delivered in a single cooler directly to the SGS Anchorage laboratory which was received within the acceptable temperature range.

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

   Yes☒ No☐ N/A☐ Comments:

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

   Yes☒ No☐ N/A☐ Comments:

   Samples were received in good condition.

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☐ N/A☒ Comments:

There were no sample receiving discrepancies.

e. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

4. Case Narrative

a. Present and understandable?

Yes☒ No☐ N/A☐ Comments:

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

Yes☒ No☐ N/A☐ Comments:

The laboratory report case narrative documented a number of QC anomalies which are addressed in the following relevant sections of this checklist.

c. Were all corrective actions documented?

Yes☐ No☐ N/A☒ Comments:

No corrective actions were documented or performed.

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

Comments:

The laboratory does not make any conclusions regarding data quality or usability in the provided case narrative.

5. Samples Results

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

Yes☒ No☐ N/A☐ Comments:

While no specific analytical methods were requested, the laboratory performed appropriate analyses for the target analytes requested on the COC.

b. All applicable holding times met?

Yes☒ No☐ N/A☐ Comments:

c. All soils reported on a dry weight basis?

Yes☒ No☐ N/A☐ Comments:

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

Yes☐ No☒ N/A☐ Comments:

LOQs and LODs were compared to the most stringent of the 18 AAC 75.341 Method Two Table B1/B2 migration to groundwater and human health soil cleanup levels (SCLs) for the under 40-inch zone. Naphthalene, 1,2-dibromoethane (all samples), and a number of other VOC results had LOQs and LODs that exceeded the most stringent applicable SCL. Refer to Table 2 of the data quality assessment (DQA) for a full list of affected results.

e. Data quality or usability affected?

Data quality is not affected for results lacking adequate analytical sensitivity. Non-detect results with LODs exceeding the PAL cannot be used to rule out the potential presence of the analyte at concentrations above the cleanup level for the sampled location.

6. QC Samples

a. Method Blank

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

Yes☒ No☐ N/A☐ Comments:

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

Yes☐ No☒ N/A☐ Comments:

GRO was detected below the LOQ in the method blank sample associated with AK101 preparatory batch VXX37618. Refer to the table below for further details.

Method	Batch	Analyte	Units	MB Conc.	LOQ
AK101	VXX37618	Gasoline Range Organics (C6-C10)	mg/kg	0.814	2.5

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

Comments:

Project-sample results are considered affected if the analyte in question is detected within ten times the associated method blank sample concentration. GRO results for two samples are considered affected. Refer to the table below.

Sample ID	Method	Analyte	Units	Result	LOQ	QC Flag
2-15-N-01	AK101	GRO	mg/kg	2.77	5.15	B
2-15-N-02	AK101	GRO	mg/kg	1.85	4.54	B

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

Yes☒ No☐ N/A☐ Comments:

The affected GRO results are qualified as estimated and flagged ‘B’, indicating a high bias and potential false-positive detection due to laboratory-based contamination.

v. Data quality or usability affected?

Comments:

Data quality is affected as described above. The impact to data usability is minimal, as the affected results are below the cleanup level, despite the potential high bias.

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☐ N/A☐ Comments:

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

Yes☒ No☐ N/A☐ Comments:

An LCS and MS duplicate were analyzed for the single inorganic method preparatory batch.

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

Yes☒ No☐ N/A☐ Comments:

There were no LCS/LCSD recovery failures identified.

iv. Precision – All relative percent differences (RPD) 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☐ N/A☐ Comments:

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

Comments:

There were no LCS/LCSD recovery or RPD failures identified.

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

Yes☐ No☐ N/A☒ Comments:

NA; see above.

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

Comments:

Data quality and usability were not affected.

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☐ N/A☐ Comments:

Additional volume was submitted with sample 2-15-FL-01 for organic analysis matrix spiking. At least one preparatory batch per organic method performed included MS/MSD analysis.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes☒ No☐ N/A☐ Comments:

Additional volume was submitted with sample 2-15-FL-01 for inorganic analysis matrix spiking.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes☐ No☒ N/A☐ Comments:

Barium was recovered below the lower control limit for the project-associated and non-project-associated MS/MSDs performed for prep batch MXX34510. The laboratory performed successful post digestion spikes for the failing recoveries, and spiking concentrations were below native analyte concentrations of the parent sample, so data quality was not affected.
GRO and the AK101 surrogate were recovered above laboratory control limits in the MS/MSD for AK101 prep batch VXX37618; spiking concentrations were below native analyte concentrations of the parent sample, so data quality was not affected.
A number of VOC analytes were recovered outside laboratory control limits in the MS/MSD for 8260D prep batch VXX3767, however, the spiked parent sample was not associated with the project sample set, so data quality was not affected.
DRO and RRO were recovered below laboratory control limits for the project-associated MSD for AK102/AK103 prep batch XXX45331; spiking concentrations were below native analyte concentrations of the parent sample, so data quality was not affected.
A number of PAH analytes were recovered above laboratory control limits in the MS/MSD for 8270DSIM prep batch XXX45334. In each instance, the spiking concentration was below the native analyte concentration or the analyte was not detected in the parent sample, so data quality was not affected.
No results are considered affected by MS/MSD recovery failures.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes☐ No☒ N/A☐ Comments:

The MS/MSD RPD of n-butylbenzene exceeded laboratory control limits for 8260D prep batch VXX37637. The analyte was not detected in the parent sample, so no results are considered affected.

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

Comments:

There were no MS/MSD recovery or RPD failures affecting project-sample data quality, see above.

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

Yes☐ No☐ N/A☒ Comments:

No project-sample results were qualified; see above.

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

Comments:

Data quality and usability were not affected.

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☐ N/A☐ 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 for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes☐ No☒ N/A☐ Comments:

A number of surrogates were recovered outside laboratory control limits in various project-samples and QC samples. QC-sample surrogate recovery failures are not considered to affect project sample data quality or usability where the surrogate is recovered within limits in associated project-samples, or the associated target analytes are recovered within limits in the QC sample. Refer to the table below for a full list of project-sample surrogate recovery failures.

Client Sample ID	Method	Surrogate	DF	PercentRecovery	UCL	recovery
2-15-FL-01	8270DSIM	2-Methylnaphthalene-d10	5.0	122.0	103.0	high
2-15-FL-01	AK101	4-Bromofluorobenzene	5.0	2640.0	150.0	high

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

Yes☒ No☐ N/A☐ Comments:

Project-sample results are not considered affected by surrogate recovery failures where the sample was heavily diluted (DF>10). Additionally, non-detect results are not considered affected by high surrogate recovery failures.
Refer to the table below for a full list of affected results. Affected results are qualified as estimated and flagged 'J+', indicating a high bias.

Client Sample ID	Method	Analyte	CAS	Result	QC Flag
2-15-FL-01	8270DSIM	Fluorene	86-73-7	1150 (µg/kg)	J+
2-15-FL-01	8270DSIM	Phenanthrene	85-01-8	2440 (µg/kg)	J+
2-15-FL-01	AK101	Gasoline Range Organics (C6-C10)	GRO-C6-C10	419 (mg/kg)	J+

iv. Data quality or usability affected?

Comments:

Data quality is affected as described above. The impact to data usability is minimal for affected 2-15-FL-01 results, as concentrations of other petroleum related analytes in the sample exceed the most stringent applicable cleanup levels.

e. Trip Blanks

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes☒ No☐ N/A☐ Comments:

A soil trip blank sample was submitted alongside project samples and analyzed for VOCs by 8260D and GRO by AK101.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes☒ No☐ N/A☐ Comments:

Samples were submitted in a single cooler.

iii. All results less than LOQ and project specified objectives?

Yes☒ No☐ N/A☐ Comments:

No analytes were detected in the trip blank sample.

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

Comments:

No results were affected, see above.

v. Data quality or usability affected?

Comments:

Data quality and usability were not affected.

f. Field Duplicate

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

Yes☒ No☐ N/A☐ Comments:

Sample 2-15-N02 was submitted as a field duplicate of sample 2-15-N01.

ii. Submitted blind to lab?

Yes☒ No☐ N/A☐ Comments:

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

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

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

Yes☒ No☐ N/A☐ Comments:

RPDs were calculated and compared to the ADEC recommended measurement quality objective (MQO) of 50% for soil sample duplicate pairs, for analytes that were quantitatively detected (above the LOQ) in at least one sample. There were no RPD failures.

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

Data quality and usability were not affected.

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

Yes☐ No☐ N/A☒ Comments:

Samples were collected using single-use sampling equipment. No equipment blank was submitted.

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

Yes☐ No☐ N/A☒ Comments:

NA; see above.

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

No samples were affected; see above.

iii. Data quality or usability affected?
Comments:

Data quality and usability were not affected.

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

a. Defined and appropriate?

Yes☐ No☐ N/A☒ Comments:

There were no additional laboratory-specific qualifiers applied.

Laboratory Report of Analysis

To: Hilcorp Alaska, LLC
3800 Centerpoint Dr
Anchorage, AK 99503
(907)777-8300

Report Number: **1214832**

Client Project: **Susitna Environmental LLC**

Dear Kelly Nixon,

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: **Hilcorp Alaska, LLC**
SGS Project: **1214832**
Project Name/Site: **Susitna Environmental LLC**
Project Contact: **Kelly Nixon**

Refer to sample receipt form for information on sample condition.

EX-01 (1214832001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
AK102 - Surrogate recovery for 5a-androstane does not meet QC criteria due to matrix interference.
8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria due to sample dilution.

1214844032(1628022MS) (1628024) MS

6020B – Metals MS recoveries for several analytes do not meet QC criteria. The post digestion spike was successful.

1214844032(1628022MSD) (1628025) MSD

6020B – Metals MSD recoveries for several analytes do not meet QC criteria. The post digestion spike was successful.

*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
8270D SIM (PAH)				
1214846003	LABREFQC	XMS12842	Benzo[k]fluoranthene	RP
1214846003	LABREFQC	XMS12842	Naphthalene	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.

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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.

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

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
EX-01	1214832001	07/30/2021	08/03/2021	Soil/Solid (dry weight)
Trip Blank	1214832002	07/30/2021	08/03/2021	Soil/Solid (dry weight)

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

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Detectable Results Summary

Client Sample ID: **EX-01**
Lab Sample ID: 1214832001

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	10.4	mg/kg
	Barium	194	mg/kg
	Cadmium	0.242	mg/kg
	Chromium	35.8	mg/kg
	Lead	7.25	mg/kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	56200	ug/kg
	2-Methylnaphthalene	90000	ug/kg
	Fluorene	4890J	ug/kg
	Naphthalene	34100	ug/kg
	Phenanthrene	10200	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	8690	mg/kg
	Residual Range Organics	3720	mg/kg
Volatile Fuels	Gasoline Range Organics	523	mg/kg
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	5160	ug/kg
	1,3,5-Trimethylbenzene	832	ug/kg
	Ethylbenzene	6010	ug/kg
	Isopropylbenzene (Cumene)	3100	ug/kg
	Naphthalene	13600	ug/kg
	P & M -Xylene	3120	ug/kg
	sec-Butylbenzene	2620	ug/kg
	tert-Butylbenzene	262J	ug/kg
	Xylenes (total)	3120	ug/kg

Client Sample ID: **Trip Blank**
Lab Sample ID: 1214832002

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	1.07J	mg/kg

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200 West Potter Drive, Anchorage, AK 99518
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Results of **EX-01**

Client Sample ID: **EX-01**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832001
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location: SRF 21-01

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	10.4		1.15	0.355	mg/kg	10		08/05/21 19:06
Barium	194		0.344	0.108	mg/kg	10		08/05/21 19:06
Cadmium	0.242		0.229	0.0711	mg/kg	10		08/05/21 19:06
Chromium	35.8		1.15	0.355	mg/kg	10		08/09/21 14:15
Lead	7.25		0.229	0.0711	mg/kg	10		08/05/21 19:06
Mercury	0.172	U	0.344	0.115	mg/kg	10		08/05/21 19:06
Selenium	1.15	U	2.29	0.711	mg/kg	10		08/05/21 19:06
Silver	0.286	U	0.573	0.172	mg/kg	10		08/05/21 19:06

Batch Information

Analytical Batch: MMS11233
Analytical Method: SW6020B
Analyst: DMM
Analytical Date/Time: 08/09/21 14:15
Container ID: 1214832001-A

Prep Batch: MXX34498
Prep Method: SW3050B
Prep Date/Time: 08/05/21 07:42
Prep Initial Wt./Vol.: 1.036 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11229
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/05/21 19:06
Container ID: 1214832001-A

Prep Batch: MXX34498
Prep Method: SW3050B
Prep Date/Time: 08/05/21 07:42
Prep Initial Wt./Vol.: 1.036 g
Prep Extract Vol: 50 mL

Results of **EX-01**

Client Sample ID: **EX-01**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832001
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location: SRF 21-01

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	56200		5900	1470	ug/kg	200		08/10/21 13:27
2-Methylnaphthalene	90000		5900	1470	ug/kg	200		08/10/21 13:27
Acenaphthene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Acenaphthylene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Anthracene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Benzo(a)Anthracene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Benzo[a]pyrene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Benzo[b]Fluoranthene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Benzo[g,h,i]perylene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Benzo[k]fluoranthene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Chrysene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Dibenzo[a,h]anthracene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Fluoranthene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Fluorene	4890 J		5900	1470	ug/kg	200		08/10/21 13:27
Indeno[1,2,3-c,d] pyrene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Naphthalene	34100		4720	1180	ug/kg	200		08/10/21 13:27
Phenanthrene	10200		5900	1470	ug/kg	200		08/10/21 13:27
Pyrene	2950 U		5900	1470	ug/kg	200		08/10/21 13:27
Surrogates								
2-Methylnaphthalene-d10 (surr)	0	*	58-103		%	200		08/10/21 13:27
Fluoranthene-d10 (surr)	0	*	54-113		%	200		08/10/21 13:27

Batch Information

Analytical Batch: XMS12811
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/10/21 13:27
Container ID: 1214832001-A

Prep Batch: XXX45323
Prep Method: SW3550C
Prep Date/Time: 08/06/21 07:44
Prep Initial Wt./Vol.: 22.658 g
Prep Extract Vol: 5 mL

Print Date: 08/24/2021 8:48:16AM

J flagging is activated

Results of **EX-01**

Client Sample ID: **EX-01**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832001
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location: SRF 21-01

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	8690		236	73.3	mg/kg	10		08/09/21 04:39
Surrogates								
5a Androstane (surr)	164	*	50-150		%	10		08/09/21 04:39

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/09/21 04:39
Container ID: 1214832001-A

Prep Batch: XXX45317
Prep Method: SW3550C
Prep Date/Time: 08/05/21 10:18
Prep Initial Wt./Vol.: 30.144 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	3720		118	50.8	mg/kg	1		08/06/21 04:32
Surrogates								
n-Triacontane-d62 (surr)	115		50-150		%	1		08/06/21 04:32

Batch Information

Analytical Batch: XFC16028
Analytical Method: AK103
Analyst: A.A
Analytical Date/Time: 08/06/21 04:32
Container ID: 1214832001-A

Prep Batch: XXX45317
Prep Method: SW3550C
Prep Date/Time: 08/05/21 10:18
Prep Initial Wt./Vol.: 30.144 g
Prep Extract Vol: 5 mL

Print Date: 08/24/2021 8:48:16AM

J flagging is activated

Results of **EX-01**

Client Sample ID: **EX-01**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832001
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location: SRF 21-01

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	523		47.6	14.3	mg/kg	10		08/06/21 16:07
Surrogates								
4-Bromofluorobenzene (surr)	1350	*	50-150		%	10		08/06/21 16:07

Batch Information

Analytical Batch: VFC15754
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/06/21 16:07
Container ID: 1214832001-B

Prep Batch: VXX37598
Prep Method: SW5035A
Prep Date/Time: 07/30/21 10:06
Prep Initial Wt./Vol.: 38.914 g
Prep Extract Vol: 31.1581 mL

Results of **EX-01**

Client Sample ID: **EX-01**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832001
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
Matrix: Soil/Solid (dry weight)
Solids (%):84.2
Location: SRF 21-01

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	5160		951	285	ug/kg	10		08/11/21 18:45
1,2-Dibromoethane	9.50 U		19.0	7.61	ug/kg	10		08/11/21 18:45
1,2-Dichloroethane	19.0 U		38.0	13.3	ug/kg	10		08/11/21 18:45
1,3,5-Trimethylbenzene	832		476	148	ug/kg	10		08/11/21 18:45
Benzene	119 U		238	74.2	ug/kg	10		08/11/21 18:45
Ethylbenzene	6010		476	148	ug/kg	10		08/11/21 18:45
Isopropylbenzene (Cumene)	3100		476	148	ug/kg	10		08/11/21 18:45
Methyl-t-butyl ether	950 U		1900	590	ug/kg	10		08/11/21 18:45
Naphthalene	13600		476	148	ug/kg	10		08/11/21 18:45
n-Butylbenzene	238 U		476	148	ug/kg	10		08/11/21 18:45
o-Xylene	238 U		476	148	ug/kg	10		08/11/21 18:45
P & M -Xylene	3120		951	285	ug/kg	10		08/11/21 18:45
sec-Butylbenzene	2620		476	148	ug/kg	10		08/11/21 18:45
tert-Butylbenzene	262 J		476	148	ug/kg	10		08/11/21 18:45
Toluene	238 U		476	148	ug/kg	10		08/11/21 18:45
Xylenes (total)	3120		1430	434	ug/kg	10		08/11/21 18:45
Surrogates								
1,2-Dichloroethane-D4 (surr)	93.2		71-136		%	10		08/11/21 18:45
4-Bromofluorobenzene (surr)	106		55-151		%	10		08/11/21 18:45
Toluene-d8 (surr)	102		85-116		%	10		08/11/21 18:45

Batch Information

Analytical Batch: VMS21044
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/11/21 18:45
Container ID: 1214832001-B

Prep Batch: VXX37632
Prep Method: SW5035A
Prep Date/Time: 07/30/21 10:06
Prep Initial Wt./Vol.: 38.914 g
Prep Extract Vol: 31.1581 mL

Print Date: 08/24/2021 8:48:16AM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832002
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
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	1.07	J	2.53	0.759	mg/kg	1		08/06/21 15:13
Surrogates								
4-Bromofluorobenzene (surr)	75.9		50-150		%	1		08/06/21 15:13

Batch Information

Analytical Batch: VFC15754
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/06/21 15:13
Container ID: 1214832002-A

Prep Batch: VXX37598
Prep Method: SW5035A
Prep Date/Time: 07/30/21 10:06
Prep Initial Wt./Vol.: 49.416 g
Prep Extract Vol: 25 mL

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Susitna Environmental LLC**
Lab Sample ID: 1214832002
Lab Project ID: 1214832

Collection Date: 07/30/21 10:06
Received Date: 08/03/21 11:18
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	25.3 U		50.6	15.2	ug/kg	1		08/11/21 15:43
1,2-Dibromoethane	0.505 U		1.01	0.405	ug/kg	1		08/11/21 15:43
1,2-Dichloroethane	1.01 U		2.02	0.708	ug/kg	1		08/11/21 15:43
1,3,5-Trimethylbenzene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
Benzene	6.30 U		12.6	3.95	ug/kg	1		08/11/21 15:43
Ethylbenzene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
Isopropylbenzene (Cumene)	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
Methyl-t-butyl ether	50.5 U		101	31.4	ug/kg	1		08/11/21 15:43
Naphthalene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
n-Butylbenzene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
o-Xylene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
P & M -Xylene	25.3 U		50.6	15.2	ug/kg	1		08/11/21 15:43
sec-Butylbenzene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
tert-Butylbenzene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
Toluene	12.7 U		25.3	7.89	ug/kg	1		08/11/21 15:43
Xylenes (total)	38.0 U		75.9	23.1	ug/kg	1		08/11/21 15:43
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		08/11/21 15:43
4-Bromofluorobenzene (surr)	98.4		55-151		%	1		08/11/21 15:43
Toluene-d8 (surr)	100		85-116		%	1		08/11/21 15:43

Batch Information

Analytical Batch: VMS21044
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/11/21 15:43
Container ID: 1214832002-A

Prep Batch: VXX37632
Prep Method: SW5035A
Prep Date/Time: 07/30/21 10:06
Prep Initial Wt./Vol.: 49.416 g
Prep Extract Vol: 25 mL

Print Date: 08/24/2021 8:48:16AM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1823543 [MXX/34498]
Blank Lab ID: 1628020

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001

Results by **SW6020B**

Parameter	Results	LOQ/CL	DL	Units
Arsenic	0.500U	1.00	0.310	mg/kg
Barium	0.150U	0.300	0.0940	mg/kg
Cadmium	0.100U	0.200	0.0620	mg/kg
Chromium	0.500U	1.00	0.310	mg/kg
Lead	0.100U	0.200	0.0620	mg/kg
Mercury	0.150U	0.300	0.100	mg/kg
Selenium	1.00U	2.00	0.620	mg/kg
Silver	0.250U	0.500	0.150	mg/kg

Batch Information

Analytical Batch: MMS11229
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/5/2021 6:07:25PM

Prep Batch: MXX34498
Prep Method: SW3050B
Prep Date/Time: 8/5/2021 7:42:08AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1214832 [MXX34498]
Blank Spike Lab ID: 1628021
Date Analyzed: 08/05/2021 18:11

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214832001

Results by **SW6020B**

Blank Spike (mg/kg)

Parameter	Spike	Result	Rec (%)	CL
Arsenic	50	52.0	104	(82-118)
Barium	50	46.6	93	(86-116)
Cadmium	5	5.26	105	(84-116)
Chromium	20	19.9	99	(83-119)
Lead	50	55.2	110	(84-118)
Mercury	0.5	0.502	100	(74-126)
Selenium	50	51.6	103	(80-119)
Silver	5	5.25	105	(83-118)

Batch Information

Analytical Batch: **MMS11229**
Analytical Method: **SW6020B**
Instrument: **Perkin Elmer Nexion P5**
Analyst: **ACF**

Prep Batch: **MXX34498**
Prep Method: **SW3050B**
Prep Date/Time: **08/05/2021 07:42**
Spike Init Wt./Vol.: 50 mg/kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1628022
MS Sample ID: 1628024 MS
MSD Sample ID: 1628025 MSD

QC for Samples: 1214832001

Analysis Date: 08/05/2021 18:15
Analysis Date: 08/05/2021 18:20
Analysis Date: 08/05/2021 18:24
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020B**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Arsenic	5.62	48.5	55.1	102	46.1	52.4	101	82-118	4.94	(< 20)
Barium	66.2	48.5	123	117 *	46.1	126	130 *	86-116	2.43	(< 20)
Cadmium	0.470U	4.85	5.23	108	4.61	4.73	102	84-116	10.10	(< 20)
Chromium	18.7	19.4	46.2	142 *	18.5	46.8	152 *	83-119	1.41	(< 20)
Lead	6.41	48.5	62.8	116	46.1	58.5	113	84-118	7.04	(< 20)
Mercury	0.705U	0.485	.513J	106	0.461	0.470J	102	74-126	8.75	(< 20)
Selenium	4.71U	48.5	47.7	98	46.1	47.4	103	80-119	0.68	(< 20)
Silver	1.18U	4.85	5.06	104	4.61	4.50	98	83-118	11.80	(< 20)

Batch Information

Analytical Batch: MMS11229
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/5/2021 6:20:00PM

Prep Batch: MXX34498
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/5/2021 7:42:08AM
Prep Initial Wt./Vol.: 1.03g
Prep Extract Vol: 50.00mL

Print Date: 08/24/2021 8:48:22AM

Bench Spike Summary

Original Sample ID: 1628022
MS Sample ID: 1628023 BND
MSD Sample ID:

QC for Samples: 1214832001

Analysis Date: 08/05/2021 18:15
Analysis Date: 08/05/2021 18:28
Analysis Date:
Matrix: Solid/Soil (Wet Weight)

Results by **SW6020B**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Barium	66.2	1180	1270	102				75-125		
Chromium	18.7	588	605	100				75-125		

Batch Information

Analytical Batch: MMS11229
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/5/2021 6:28:00PM

Prep Batch: MXX34498
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/5/2021 7:42:08AM
Prep Initial Wt./Vol.: 1.06g
Prep Extract Vol: 50.00mL

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Method Blank

Blank ID: MB for HBN 1823548 [SPT/11341]
Blank Lab ID: 1628073

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11341
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM
Analytical Date/Time: 8/4/2021 5:10:00PM

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Duplicate Sample Summary

Original Sample ID: 1214764005
Duplicate Sample ID: 1628075
QC for Samples:

Analysis Date: 08/04/2021 17:10
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.2	93.6	%	0.49	(< 15)

Batch Information

Analytical Batch: SPT11341
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 08/24/2021 8:48:25AM

Duplicate Sample Summary

Original Sample ID: 1214764006
Duplicate Sample ID: 1628076
QC for Samples:
1214832001

Analysis Date: 08/04/2021 17:10
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.9	93.2	%	0.74	(< 15)

Batch Information

Analytical Batch: SPT11341
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 08/24/2021 8:48:25AM

Duplicate Sample Summary

Original Sample ID: 1214844052
Duplicate Sample ID: 1628077
QC for Samples:
1214832001

Analysis Date: 08/04/2021 17:10
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	90.3	91.7	%	1.50	(< 15)

Batch Information

Analytical Batch: SPT11341
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 08/24/2021 8:48:25AM

Method Blank

Blank ID: MB for HBN 1823679 [VXX/37598]
Blank Lab ID: 1628598

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001, 1214832002

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.08J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	75.9	50-150		%

Batch Information

Analytical Batch: VFC15754
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/6/2021 11:54:00AM

Prep Batch: VXX37598
Prep Method: SW5035A
Prep Date/Time: 8/6/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214832 [VXX37598]
Blank Spike Lab ID: 1628599
Date Analyzed: 08/06/2021 11:18

Spike Duplicate ID: LCSD for HBN 1214832 [VXX37598]
Spike Duplicate Lab ID: 1628600
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214832001, 1214832002

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	105	12.5	12.8	102	(60-120)	2.20	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		81	1.25		85	(50-150)	4.90	

Batch Information

Analytical Batch: **VFC15754**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37598**
Prep Method: **SW5035A**
Prep Date/Time: **08/06/2021 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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Method Blank

Blank ID: MB for HBN 1824007 [VXX/37632]
Blank Lab ID: 1629701

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001, 1214832002

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/kg
1,2-Dibromoethane	0.500U	1.00	0.400	ug/kg
1,2-Dichloroethane	1.00U	2.00	0.700	ug/kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/kg
Benzene	6.25U	12.5	3.90	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	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
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
tert-Butylbenzene	12.5U	25.0	7.80	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)	107	71-136		%
4-Bromofluorobenzene (surr)	100	55-151		%
Toluene-d8 (surr)	99.7	85-116		%

Batch Information

Analytical Batch: VMS21044
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/11/2021 11:43:00AM

Prep Batch: VXX37632
Prep Method: SW5035A
Prep Date/Time: 8/11/2021 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 1214832 [VXX37632]
Blank Spike Lab ID: 1629702
Date Analyzed: 08/11/2021 11:59

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214832001, 1214832002

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	763	102	(75-123)
1,2-Dibromoethane	750	806	108	(78-122)
1,2-Dichloroethane	750	673	90	(73-128)
1,3,5-Trimethylbenzene	750	749	100	(73-124)
Benzene	750	745	99	(77-121)
Ethylbenzene	750	717	96	(76-122)
Isopropylbenzene (Cumene)	750	745	99	(68-134)
Methyl-t-butyl ether	1130	1070	95	(73-125)
Naphthalene	750	740	99	(62-129)
n-Butylbenzene	750	764	102	(70-128)
o-Xylene	750	734	98	(77-123)
P & M -Xylene	1500	1420	95	(77-124)
sec-Butylbenzene	750	738	98	(73-126)
tert-Butylbenzene	750	744	99	(73-125)
Toluene	750	738	98	(77-121)
Xylenes (total)	2250	2150	96	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750		94	(71-136)
4-Bromofluorobenzene (surr)	750		95	(55-151)
Toluene-d8 (surr)	750		100	(85-116)

Batch Information

Analytical Batch: **VMS21044**
Analytical Method: **SW8260D**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **S.S**

Prep Batch: **VXX37632**
Prep Method: **SW5035A**
Prep Date/Time: **08/11/2021 06:00**
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/24/2021 8:48:36AM

Matrix Spike Summary

Original Sample ID: 1629703
MS Sample ID: 1629704 MS
MSD Sample ID: 1629705 MSD

Analysis Date: 08/11/2021 16:16
Analysis Date: 08/11/2021 13:31
Analysis Date: 08/11/2021 13:47
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214832001, 1214832002

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	130	1060	1100	91	1060	1100	91	75-123	0.16	(< 20)
1,2-Dibromoethane	0.710U	1060	1170	111	1060	1150	108	78-122	2.10	(< 20)
1,2-Dichloroethane	1.42U	1060	995	94	1060	979	92	73-128	1.70	(< 20)
1,3,5-Trimethylbenzene	41.8	1060	1110	100	1060	1070	97	73-124	3.40	(< 20)
Benzene	8.85U	1060	1090	103	1060	1070	101	77-121	1.60	(< 20)
Ethylbenzene	17.7U	1060	1040	98	1060	1020	96	76-122	2.70	(< 20)
Isopropylbenzene (Cumene)	17.7U	1060	1090	102	1060	1060	100	68-134	2.30	(< 20)
Methyl-t-butyl ether	71.0U	1590	1570	99	1590	1560	98	73-125	0.47	(< 20)
Naphthalene	17.7U	1060	1150	108	1060	1180	111	62-129	2.30	(< 20)
n-Butylbenzene	17.7U	1060	1180	111	1060	1180	111	70-128	0.15	(< 20)
o-Xylene	15.9J	1060	1070	99	1060	1050	97	77-123	2.00	(< 20)
P & M -Xylene	36.5J	2130	2050	95	2130	2010	93	77-124	2.10	(< 20)
sec-Butylbenzene	15.2J	1060	1110	103	1060	1090	101	73-126	1.80	(< 20)
tert-Butylbenzene	17.7U	1060	1100	104	1060	1090	103	73-125	0.61	(< 20)
Toluene	17.7U	1060	1070	101	1060	1050	99	77-121	1.70	(< 20)
Xylenes (total)	52.4J	3190	3120	96	3190	3060	94	78-124	2.10	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		1060	1010	95	1060	1010	95	71-136	0.74	
4-Bromofluorobenzene (surr)		1770	1580	89	1770	1580	89	55-151	0.29	
Toluene-d8 (surr)		1060	1060	100	1060	1060	100	85-116	0.03	

Batch Information

Analytical Batch: VMS21044
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/11/2021 1:31:00PM

Prep Batch: VXX37632
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/11/2021 6:00:00AM
Prep Initial Wt./Vol.: 35.29g
Prep Extract Vol: 25.00mL

Print Date: 08/24/2021 8:48:37AM

Method Blank

Blank ID: MB for HBN 1823549 [XXX/45317]
Blank Lab ID: 1628089

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	6.65J	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	101	60-120		%

Batch Information

Analytical Batch: XFC16028
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: A.A
Analytical Date/Time: 8/6/2021 12:35:00AM

Prep Batch: XXX45317
Prep Method: SW3550C
Prep Date/Time: 8/5/2021 10:18:30AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214832 [XXX45317]
Blank Spike Lab ID: 1628090
Date Analyzed: 08/06/2021 00:46

Spike Duplicate ID: LCSD for HBN 1214832 [XXX45317]
Spike Duplicate Lab ID: 1628091
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214832001

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	675	101	667	761	114	(75-125)	12.00	(< 20)
Surrogates									
5a Androstane (surr)	16.7		103	16.7		115	(60-120)	10.90	

Batch Information

Analytical Batch: **XFC16028**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **A.A**

Prep Batch: **XXX45317**
Prep Method: **SW3550C**
Prep Date/Time: **08/05/2021 10:18**
Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

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

Method Blank

Blank ID: MB for HBN 1823549 [XXX/45317]
Blank Lab ID: 1628089

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001

Results by **AK103**

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

Batch Information

Analytical Batch: XFC16028
Analytical Method: AK103
Instrument: Agilent 7890B R
Analyst: A.A
Analytical Date/Time: 8/6/2021 12:35:00AM

Prep Batch: XXX45317
Prep Method: SW3550C
Prep Date/Time: 8/5/2021 10:18:30AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214832 [XXX45317]
Blank Spike Lab ID: 1628090
Date Analyzed: 08/06/2021 00:46

Spike Duplicate ID: LCSD for HBN 1214832 [XXX45317]
Spike Duplicate Lab ID: 1628091
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214832001

Results by **AK103**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	667	640	96	667	716	107	(60-120)	11.20	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7		98	16.7		120	(60-120)	20.10	

Batch Information

Analytical Batch: **XFC16028**
Analytical Method: **AK103**
Instrument: **Agilent 7890B R**
Analyst: **A.A**

Prep Batch: **XXX45317**
Prep Method: **SW3550C**
Prep Date/Time: **08/05/2021 10:18**
Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

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

Method Blank

Blank ID: MB for HBN 1823601 [XXX/45323]
Blank Lab ID: 1628292

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214832001

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)	90.8	58-103		%
Fluoranthene-d10 (surr)	89.7	54-113		%

Batch Information

Analytical Batch: XMS12811
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/10/2021 10:02:00AM

Prep Batch: XXX45323
Prep Method: SW3550C
Prep Date/Time: 8/6/2021 7:44:49AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 08/24/2021 8:48:47AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214832 [XXX45323]
Blank Spike Lab ID: 1628293
Date Analyzed: 08/10/2021 10:22

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214832001

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

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
Benzo(a)Anthracene	111	102	92	(54-122)
Benzo[a]pyrene	111	104	93	(50-125)
Benzo[b]Fluoranthene	111	107	96	(53-128)
Benzo[g,h,i]perylene	111	113	102	(49-127)
Benzo[k]fluoranthene	111	104	94	(56-123)
Chrysene	111	103	93	(57-118)
Fluoranthene	111	103	93	(55-119)
Pyrene	111	101	91	(55-117)
1-Methylnaphthalene	111	89.2	80	(43-111)
2-Methylnaphthalene	111	92.0	83	(39-114)
Acenaphthene	111	98.4	89	(44-111)
Acenaphthylene	111	102	92	(39-116)
Anthracene	111	97.4	88	(50-114)
Dibenzo[a,h]anthracene	111	82.9	75	(50-129)
Fluorene	111	98.5	89	(47-114)
Indeno[1,2,3-c,d] pyrene	111	80.7	73	(49-130)
Naphthalene	111	85.0	77	(38-111)
Phenanthrene	111	96.4	87	(49-113)
Surrogates				
Fluoranthene-d10 (surr)	111		90	(54-113)
2-Methylnaphthalene-d10 (surr)	111		89	(58-103)

Batch Information

Analytical Batch: **XMS12811**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **LAW**

Prep Batch: **XXX45323**
Prep Method: **SW3550C**
Prep Date/Time: **08/06/2021 07:44**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Analytical Batch: **XMS12813**
Analytical Method: **8270D SIM (PAH)**
Instrument: **Agilent GC 7890B/5977A SWA**
Analyst: **LAW**

Prep Batch: **XXX45323**
Prep Method: **SW3550C**
Prep Date/Time: **08/06/2021 07:44**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/24/2021 8:48:49AM

Matrix Spike Summary

Original Sample ID: 1214846003
MS Sample ID: 1628294 MS
MSD Sample ID: 1628295 MSD

QC for Samples: 1214832001

Analysis Date: 08/17/2021 14:01
Analysis Date: 08/17/2021 14:22
Analysis Date: 08/17/2021 14:42
Matrix: Soil/Solid (dry weight)

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	17.3U	153	128	84	153	109	72	43-111	15.60	(< 20)
2-Methylnaphthalene	9.17J	153	132	80	153	111	67	39-114	16.90	(< 20)
Acenaphthene	17.3U	153	126	83	153	111	73	44-111	12.60	(< 20)
Acenaphthylene	17.3U	153	128	84	153	111	73	39-116	14.00	(< 20)
Anthracene	17.3U	153	123	81	153	113	74	50-114	8.20	(< 20)
Benzo(a)Anthracene	17.3U	153	122	80	153	112	73	54-122	8.60	(< 20)
Benzo[a]pyrene	10.3J	153	120	72	153	112	67	50-125	6.70	(< 20)
Benzo[b]Fluoranthene	16.8J	153	124	70	153	118	66	53-128	4.70	(< 20)
Benzo[g,h,i]perylene	11.0J	153	116	69	153	112	66	49-127	3.80	(< 20)
Benzo[k]fluoranthene	17.3U	153	121	79	153	109	71	56-123	10.60	(< 20)
Chrysene	13.5J	153	126	73	153	115	67	57-118	8.40	(< 20)
Dibenzo[a,h]anthracene	17.3U	153	114	75	153	110	72	50-129	3.70	(< 20)
Fluoranthene	19.1J	153	134	75	153	119	66	55-119	11.60	(< 20)
Fluorene	17.3U	153	126	82	153	111	73	47-114	12.60	(< 20)
Indeno[1,2,3-c,d] pyrene	17.3U	153	115	76	153	111	73	49-130	3.90	(< 20)
Naphthalene	7.61J	153	125	77	153	109	66	38-111	13.80	(< 20)
Phenanthrene	12.5J	153	128	76	153	114	67	49-113	11.60	(< 20)
Pyrene	19.2J	153	134	75	153	121	67	55-117	10.40	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		153	130	85	153	109	72	58-103	17.40	
Fluoranthene-d10 (surr)		153	127	84	153	109	71	54-113	15.60	

Batch Information

Analytical Batch: XMS12842
Analytical Method: 8270D SIM (PAH)
Instrument: Agilent GC 7890B/5977A SWA
Analyst: LAW
Analytical Date/Time: 8/17/2021 2:22:00PM

Prep Batch: XXX45323
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 8/6/2021 7:44:49AM
Prep Initial Wt./Vol.: 22.74g
Prep Extract Vol: 5.00mL

Print Date: 08/24/2021 8:48:51AM

Chain-of-Custody Report

Collection Organization: Susitna Environmental LLC | **Chain-of-Custody:** SRF 21-01 | **Cooler ID:** | **NPDL Number:**
Bill to Hilcorp | **WBS #212-00751.09.05.31** | **Laboratory:** SGS | **Bill To:** Hilcorp, Kelley Nixon | **Report To:** Susitna Environmental

COC Sample ID	Loc ID	Collection Date	Collection Time	Sampler	Quantity	Container Type	Volume	Preservative	Matrix	Analyses Requested Group	QC	TAT	Notes:
EX-01 (AB)	SRF 21-01	30-Jul-21	1006	NC/MM	1	4oz amber		4°C +/- 2°	S	DRO/RRO, PAHs, RCRA METALS		3-day	Waste Characterization
EX-01 (AB)	SRF 21-01	30-Jul-21	1006	NC/MM	1	4oz septa		MeOH	S	GRO, PETROLEUM-VOCs		3-day	Waste Characterization

1214832

Special Instructions: PID = 2056 ppm

Relinquish By: M. Mayer / Melissa Mayer 8/3/21 1100 Signature/Printed Name Date/Time	Received By: Signature/Printed Name Date/Time
Relinquish By: Signature/Printed Name Date/Time	Received By: Signature/Printed Name Date/Time
Relinquish By: Signature/Printed Name Date/Time	Received By: Michelle Albanese 8/3/21 1118 Signature/Printed Name Date/Time

pt# 364160 XD

ANC: IF, HD
8.3 D52

e-Sample Receipt Form

SGS Workorder #: **1214832** | 1214832

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)?	No	Cooler ID: 1 @ 8.3 °C Therm. ID: D52
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	
	Yes	***Exemption permitted for metals (e.g,200.8/6020B).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

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

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1214832001-A	No Preservative Required	OK			
1214832001-B	Methanol field pres. 4 C	OK			
1214832002-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
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 Report of Analysis

To: Hilcorp Alaska, LLC
3800 Centerpoint Dr
Anchorage, AK 99503
(907)777-8300

Report Number: **1214864**

Client Project: **TS2-15 Trenching**

Dear Kelly Nixon,

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: **Hilcorp Alaska, LLC**
SGS Project: **1214864**
Project Name/Site: **TS2-15 Trenching**
Project Contact: **Kelly Nixon**

Refer to sample receipt form for information on sample condition.

2-15-FL-01 (1214864004) PS

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

2-15-FL-01(1214864004BMS) (1214864005) BMS

AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
AK101 - BMS GRO recovery does not meet QC criteria due to sample dilution and matrix interference, please refer to LCS/LCSD for accuracy requirements.
6020B - Metals BMS recovery for barium does not meet QC criteria. The post digestion spike was successful.

8270D SIM - PAH BMS recoveries for multiple analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria.

2-15-FL-01(1214864004BMSD) (1214864006) BMSD

AK102/103 - BMSD recovery for DRO and RRO do not meet QC criteria. See LCS/LCSD for accuracy requirements.
AK101 - Surrogate recovery for 4-bromofluorobenzene does not meet QC criteria, due to matrix interference.
AK101 - BMSD GRO recovery does not meet QC criteria due to sample dilution and matrix interference, please refer to LCS/LCSD for accuracy requirements.
8270D SIM - PAH surrogate recovery for 2-methylnaphthalene-d10 does not meet QC criteria.
8270D SIM - PAH BMSD recoveries for multiple analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

1214864004(1628897MS) (1628899) MS

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

1214864004(1629919MS) (1629920) MS

8260D - MS recovery for several analytes do not meet QC criteria. See LCS for accuracy requirements.
8260D - MS surrogate recovery for Toluene-d8 does not meet QC criteria.

1214864004(1629919MSD) (1629921) MSD

8260D - MSD recovery for several analytes do not meet QC criteria. See LCS for accuracy requirements.
8260D - MS/MSD RPD for 1,1,2,2-Tetrachloroethane and n-Butylbenzene do not meet QC criteria. These analytes were not detected above the LOQ in the PS.
8260D - MSD surrogate recovery for Toluene-d8 does not meet QC criteria.

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

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

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
2-15-N-01	1214864001	08/03/2021	08/04/2021	Soil/Solid (dry weight)
2-15-N-02	1214864002	08/03/2021	08/04/2021	Soil/Solid (dry weight)
2-15-S-01	1214864003	08/03/2021	08/04/2021	Soil/Solid (dry weight)
2-15-FL-01	1214864004	08/03/2021	08/04/2021	Soil/Solid (dry weight)
2-15-FL-01(1214864004BMS)	1214864005	08/03/2021	08/04/2021	Soil/Solid (dry weight)
2-15-FL-01(1214864004BMSD)	1214864006	08/03/2021	08/04/2021	Soil/Solid (dry weight)
Trip Blank	1214864007	08/03/2021	08/04/2021	Soil/Solid (dry weight)

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

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Detectable Results Summary

Client Sample ID: **2-15-N-01**
Lab Sample ID: 1214864001

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	10.1	mg/kg
	Barium	159	mg/kg
	Cadmium	0.214J	mg/kg
	Chromium	38.0	mg/kg
	Lead	7.23	mg/kg
Polynuclear Aromatics GC/MS	Fluorene	9.07J	ug/kg
	Naphthalene	20.2J	ug/kg
	Phenanthrene	20.1J	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	61.7	mg/kg
	Residual Range Organics	94.2J	mg/kg
Volatile Fuels	Gasoline Range Organics	2.77J	mg/kg
Volatile GC/MS- Petroleum VOC Group	Naphthalene	50.0J	ug/kg

Client Sample ID: **2-15-N-02**
Lab Sample ID: 1214864002

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	12.2	mg/kg
	Barium	167	mg/kg
	Cadmium	0.239	mg/kg
	Chromium	39.1	mg/kg
	Lead	7.78	mg/kg
Polynuclear Aromatics GC/MS	Fluorene	9.01J	ug/kg
	Naphthalene	16.7J	ug/kg
	Phenanthrene	17.0J	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	61.0	mg/kg
	Residual Range Organics	70.4J	mg/kg
Volatile Fuels	Gasoline Range Organics	1.85J	mg/kg
Volatile GC/MS- Petroleum VOC Group	Naphthalene	40.4J	ug/kg

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Detectable Results Summary

Client Sample ID: **2-15-S-01**
Lab Sample ID: 1214864003

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	16.7	mg/kg
	Barium	195	mg/kg
	Cadmium	0.200J	mg/kg
	Chromium	40.8	mg/kg
	Lead	7.97	mg/kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	100	ug/kg
	2-Methylnaphthalene	126	ug/kg
	Chrysene	97.9	ug/kg
	Fluoranthene	41.6	ug/kg
	Fluorene	303	ug/kg
	Naphthalene	576	ug/kg
	Phenanthrene	567	ug/kg
	Pyrene	44.5	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	1960	mg/kg
	Residual Range Organics	1250	mg/kg
Volatile Fuels	Gasoline Range Organics	12.7	mg/kg
Volatile GC/MS- Petroleum VOC Group	Naphthalene	488	ug/kg

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Detectable Results Summary

Client Sample ID: **2-15-FL-01**
Lab Sample ID: 1214864004

	Parameter	Result	Units
Metals by ICP/MS	Arsenic	10.1	mg/kg
	Barium	136	mg/kg
	Cadmium	0.177J	mg/kg
	Chromium	29.7	mg/kg
	Lead	5.71	mg/kg
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	20200	ug/kg
	2-Methylnaphthalene	28300	ug/kg
	Benzo(a)Anthracene	113J	ug/kg
	Chrysene	324	ug/kg
	Fluoranthene	138J	ug/kg
	Fluorene	1150	ug/kg
	Naphthalene	10600	ug/kg
	Phenanthrene	2440	ug/kg
	Pyrene	139J	ug/kg
Semivolatile Organic Fuels	Diesel Range Organics	5910	mg/kg
	Residual Range Organics	2950	mg/kg
Volatile Fuels	Gasoline Range Organics	419	mg/kg
Volatile GC/MS- Petroleum VOC Group	1,2,4-Trimethylbenzene	10700	ug/kg
	1,3,5-Trimethylbenzene	1200	ug/kg
	Ethylbenzene	2230	ug/kg
	Isopropylbenzene (Cumene)	1580	ug/kg
	Naphthalene	9030	ug/kg
	o-Xylene	290J	ug/kg
	P & M -Xylene	1630	ug/kg
	sec-Butylbenzene	2010	ug/kg
	tert-Butylbenzene	226J	ug/kg
	Xylenes (total)	1920J	ug/kg

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Results of **2-15-N-01**

Client Sample ID: **2-15-N-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864001
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	10.1		1.12	0.346	mg/kg	10		08/14/21 05:00
Barium	159		0.335	0.105	mg/kg	10		08/14/21 05:00
Cadmium	0.214	J	0.223	0.0692	mg/kg	10		08/14/21 05:00
Chromium	38.0		1.12	0.346	mg/kg	10		08/14/21 12:07
Lead	7.23		0.223	0.0692	mg/kg	10		08/14/21 05:00
Mercury	0.168	U	0.335	0.112	mg/kg	10		08/14/21 05:00
Selenium	1.12	U	2.23	0.692	mg/kg	10		08/14/21 05:00
Silver	0.279	U	0.558	0.168	mg/kg	10		08/14/21 05:00

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 05:00
Container ID: 1214864001-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.048 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 12:07
Container ID: 1214864001-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.048 g
Prep Extract Vol: 50 mL

Results of **2-15-N-01**

Client Sample ID: **2-15-N-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864001
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
2-Methylnaphthalene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Acenaphthene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Acenaphthylene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Anthracene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Benzo(a)Anthracene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Benzo[a]pyrene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Benzo[b]Fluoranthene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Benzo[g,h,i]perylene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Benzo[k]fluoranthene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Chrysene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Dibenzo[a,h]anthracene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Fluoranthene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Fluorene	9.07	J	29.1	7.27	ug/kg	1		08/15/21 00:23
Indeno[1,2,3-c,d] pyrene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Naphthalene	20.2	J	23.3	5.82	ug/kg	1		08/15/21 00:23
Phenanthrene	20.1	J	29.1	7.27	ug/kg	1		08/15/21 00:23
Pyrene	14.6	U	29.1	7.27	ug/kg	1		08/15/21 00:23
Surrogates								
2-Methylnaphthalene-d10 (surr)	94.4		58-103		%	1		08/15/21 00:23
Fluoranthene-d10 (surr)	90.6		54-113		%	1		08/15/21 00:23

Batch Information

Analytical Batch: XMS12821
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/15/21 00:23
Container ID: 1214864001-A

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 08/07/21 12:59
Prep Initial Wt./Vol.: 22.633 g
Prep Extract Vol: 5 mL

Results of **2-15-N-01**

Client Sample ID: **2-15-N-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864001
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	61.7		23.0	7.14	mg/kg	1		08/09/21 00:05
Surrogates								
5a Androstane (surr)	84.3		50-150		%	1		08/09/21 00:05

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/09/21 00:05
Container ID: 1214864001-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.483 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	94.2	J	115	49.5	mg/kg	1		08/09/21 00:05
Surrogates								
n-Triacontane-d62 (surr)	80.7		50-150		%	1		08/09/21 00:05

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 08/09/21 00:05
Container ID: 1214864001-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.483 g
Prep Extract Vol: 5 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-N-01**

Client Sample ID: **2-15-N-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864001
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.77	J	5.15	1.55	mg/kg	1		08/10/21 22:16
Surrogates								
4-Bromofluorobenzene (surr)	97		50-150		%	1		08/10/21 22:16

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/10/21 22:16
Container ID: 1214864001-B

Prep Batch: VXX37618
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:45
Prep Initial Wt./Vol.: 34.03 g
Prep Extract Vol: 29.9569 mL

Results of **2-15-N-01**

Client Sample ID: **2-15-N-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864001
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.4
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	51.5	U	103	30.9	ug/kg	1		08/12/21 15:54
1,2-Dibromoethane	1.03	U	2.06	0.824	ug/kg	1		08/12/21 15:54
1,2-Dichloroethane	2.06	U	4.12	1.44	ug/kg	1		08/12/21 15:54
1,3,5-Trimethylbenzene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
Benzene	12.9	U	25.8	8.04	ug/kg	1		08/12/21 15:54
Ethylbenzene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
Isopropylbenzene (Cumene)	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
Methyl-t-butyl ether	103	U	206	63.9	ug/kg	1		08/12/21 15:54
Naphthalene	50.0	J	51.5	16.1	ug/kg	1		08/13/21 17:15
n-Butylbenzene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
o-Xylene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
P & M -Xylene	51.5	U	103	30.9	ug/kg	1		08/12/21 15:54
sec-Butylbenzene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
tert-Butylbenzene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
Toluene	25.8	U	51.5	16.1	ug/kg	1		08/12/21 15:54
Xylenes (total)	77.5	U	155	47.0	ug/kg	1		08/12/21 15:54
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		71-136		%	1		08/12/21 15:54
4-Bromofluorobenzene (surr)	96.7		55-151		%	1		08/12/21 15:54
Toluene-d8 (surr)	102		85-116		%	1		08/12/21 15:54

Batch Information

Analytical Batch: VMS21049
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/12/21 15:54
Container ID: 1214864001-B

Prep Batch: VXX37637
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:45
Prep Initial Wt./Vol.: 34.03 g
Prep Extract Vol: 29.9569 mL

Analytical Batch: VMS21052
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/13/21 17:15
Container ID: 1214864001-B

Prep Batch: VXX37640
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:45
Prep Initial Wt./Vol.: 34.03 g
Prep Extract Vol: 29.9569 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-N-02**

Client Sample ID: **2-15-N-02**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864002
Lab Project ID: 1214864

Collection Date: 08/03/21 07:50
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	12.2		1.15	0.355	mg/kg	10		08/14/21 05:04
Barium	167		0.344	0.108	mg/kg	10		08/14/21 05:04
Cadmium	0.239		0.229	0.0711	mg/kg	10		08/14/21 05:04
Chromium	39.1		1.15	0.355	mg/kg	10		08/14/21 12:11
Lead	7.78		0.229	0.0711	mg/kg	10		08/14/21 05:04
Mercury	0.172	U	0.344	0.115	mg/kg	10		08/14/21 05:04
Selenium	1.15	U	2.29	0.711	mg/kg	10		08/14/21 05:04
Silver	0.286	U	0.573	0.172	mg/kg	10		08/14/21 05:04

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 05:04
Container ID: 1214864002-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.028 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 12:11
Container ID: 1214864002-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.028 g
Prep Extract Vol: 50 mL

Results of **2-15-N-02**

Client Sample ID: **2-15-N-02**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864002
Lab Project ID: 1214864

Collection Date: 08/03/21 07:50
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
2-Methylnaphthalene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Acenaphthene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Acenaphthylene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Anthracene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Benzo(a)Anthracene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Benzo[a]pyrene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Benzo[b]Fluoranthene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Benzo[g,h,i]perylene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Benzo[k]fluoranthene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Chrysene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Dibenzo[a,h]anthracene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Fluoranthene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Fluorene	9.01	J	29.4	7.35	ug/kg	1		08/15/21 00:44
Indeno[1,2,3-c,d] pyrene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Naphthalene	16.7	J	23.5	5.88	ug/kg	1		08/15/21 00:44
Phenanthrene	17.0	J	29.4	7.35	ug/kg	1		08/15/21 00:44
Pyrene	14.7	U	29.4	7.35	ug/kg	1		08/15/21 00:44
Surrogates								
2-Methylnaphthalene-d10 (surr)	92.2		58-103		%	1		08/15/21 00:44
Fluoranthene-d10 (surr)	91.5		54-113		%	1		08/15/21 00:44

Batch Information

Analytical Batch: XMS12821
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/15/21 00:44
Container ID: 1214864002-A

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 08/07/21 12:59
Prep Initial Wt./Vol.: 22.537 g
Prep Extract Vol: 5 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-N-02**

Client Sample ID: **2-15-N-02**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864002
Lab Project ID: 1214864

Collection Date: 08/03/21 07:50
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	61.0		23.5	7.29	mg/kg	1		08/09/21 00:15
Surrogates								
5a Androstane (surr)	90.6		50-150		%	1		08/09/21 00:15

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/09/21 00:15
Container ID: 1214864002-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.081 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	70.4	J	118	50.5	mg/kg	1		08/09/21 00:15
Surrogates								
n-Triacontane-d62 (surr)	85.7		50-150		%	1		08/09/21 00:15

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 08/09/21 00:15
Container ID: 1214864002-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.081 g
Prep Extract Vol: 5 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-N-02**

Client Sample ID: **2-15-N-02**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864002
Lab Project ID: 1214864

Collection Date: 08/03/21 07:50
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.85 J		4.54	1.36	mg/kg	1		08/10/21 22:34
Surrogates								
4-Bromofluorobenzene (surr)	96		50-150		%	1		08/10/21 22:34

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/10/21 22:34
Container ID: 1214864002-B

Prep Batch: VXX37618
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:50
Prep Initial Wt./Vol.: 40.403 g
Prep Extract Vol: 31.1102 mL

Results of **2-15-N-02**

Client Sample ID: **2-15-N-02**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864002
Lab Project ID: 1214864

Collection Date: 08/03/21 07:50
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):84.9
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	45.4	U	90.7	27.2	ug/kg	1		08/12/21 16:11
1,2-Dibromoethane	0.905	U	1.81	0.726	ug/kg	1		08/12/21 16:11
1,2-Dichloroethane	1.81	U	3.63	1.27	ug/kg	1		08/12/21 16:11
1,3,5-Trimethylbenzene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
Benzene	11.4	U	22.7	7.08	ug/kg	1		08/12/21 16:11
Ethylbenzene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
Isopropylbenzene (Cumene)	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
Methyl-t-butyl ether	90.5	U	181	56.2	ug/kg	1		08/12/21 16:11
Naphthalene	40.4	J	45.4	14.2	ug/kg	1		08/13/21 17:31
n-Butylbenzene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
o-Xylene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
P & M -Xylene	45.4	U	90.7	27.2	ug/kg	1		08/12/21 16:11
sec-Butylbenzene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
tert-Butylbenzene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
Toluene	22.7	U	45.4	14.2	ug/kg	1		08/12/21 16:11
Xylenes (total)	68.0	U	136	41.4	ug/kg	1		08/12/21 16:11
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		71-136		%	1		08/12/21 16:11
4-Bromofluorobenzene (surr)	100		55-151		%	1		08/12/21 16:11
Toluene-d8 (surr)	102		85-116		%	1		08/12/21 16:11

Batch Information

Analytical Batch: VMS21049
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/12/21 16:11
Container ID: 1214864002-B

Prep Batch: VXX37637
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:50
Prep Initial Wt./Vol.: 40.403 g
Prep Extract Vol: 31.1102 mL

Analytical Batch: VMS21052
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/13/21 17:31
Container ID: 1214864002-B

Prep Batch: VXX37640
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:50
Prep Initial Wt./Vol.: 40.403 g
Prep Extract Vol: 31.1102 mL

Results of **2-15-S-01**

Client Sample ID: **2-15-S-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864003
Lab Project ID: 1214864

Collection Date: 08/03/21 08:40
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.1
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	16.7		1.07	0.332	mg/kg	10		08/14/21 05:50
Barium	195		0.322	0.101	mg/kg	10		08/14/21 05:50
Cadmium	0.200	J	0.214	0.0665	mg/kg	10		08/14/21 05:50
Chromium	40.8		1.07	0.332	mg/kg	10		08/17/21 16:47
Lead	7.97		0.214	0.0665	mg/kg	10		08/14/21 12:58
Mercury	0.161	U	0.322	0.107	mg/kg	10		08/14/21 05:50
Selenium	1.07	U	2.14	0.665	mg/kg	10		08/14/21 05:50
Silver	0.268	U	0.536	0.161	mg/kg	10		08/14/21 05:50

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 05:50
Container ID: 1214864003-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.096 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 12:58
Container ID: 1214864003-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.096 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11252
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/17/21 16:47
Container ID: 1214864003-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.096 g
Prep Extract Vol: 50 mL

Results of **2-15-S-01**

Client Sample ID: **2-15-S-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864003
Lab Project ID: 1214864

Collection Date: 08/03/21 08:40
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.1
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	100		29.4	7.34	ug/kg	1		08/15/21 01:04
2-Methylnaphthalene	126		29.4	7.34	ug/kg	1		08/15/21 01:04
Acenaphthene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Acenaphthylene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Anthracene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Benzo(a)Anthracene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Benzo[a]pyrene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Benzo[b]Fluoranthene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Benzo[g,h,i]perylene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Benzo[k]fluoranthene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Chrysene	97.9		29.4	7.34	ug/kg	1		08/15/21 01:04
Dibenzo[a,h]anthracene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Fluoranthene	41.6		29.4	7.34	ug/kg	1		08/15/21 01:04
Fluorene	303		29.4	7.34	ug/kg	1		08/15/21 01:04
Indeno[1,2,3-c,d] pyrene	14.7 U		29.4	7.34	ug/kg	1		08/15/21 01:04
Naphthalene	576		23.5	5.87	ug/kg	1		08/15/21 01:04
Phenanthrene	567		29.4	7.34	ug/kg	1		08/15/21 01:04
Pyrene	44.5		29.4	7.34	ug/kg	1		08/15/21 01:04
Surrogates								
2-Methylnaphthalene-d10 (surr)	95		58-103		%	1		08/15/21 01:04
Fluoranthene-d10 (surr)	96.6		54-113		%	1		08/15/21 01:04

Batch Information

Analytical Batch: XMS12821
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/15/21 01:04
Container ID: 1214864003-A

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 08/07/21 12:59
Prep Initial Wt./Vol.: 22.514 g
Prep Extract Vol: 5 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-S-01**

Client Sample ID: **2-15-S-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864003
Lab Project ID: 1214864

Collection Date: 08/03/21 08:40
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1960		23.4	7.26	mg/kg	1		08/09/21 00:24
Surrogates								
5a Androstane (surr)	105		50-150		%	1		08/09/21 00:24

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/09/21 00:24
Container ID: 1214864003-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.096 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	1250		117	50.4	mg/kg	1		08/09/21 00:24
Surrogates								
n-Triacontane-d62 (surr)	82		50-150		%	1		08/09/21 00:24

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 08/09/21 00:24
Container ID: 1214864003-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.096 g
Prep Extract Vol: 5 mL

Results of **2-15-S-01**

Client Sample ID: **2-15-S-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864003
Lab Project ID: 1214864

Collection Date: 08/03/21 08:40
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	12.7		4.38	1.31	mg/kg	1		08/10/21 22:52
Surrogates								
4-Bromofluorobenzene (surr)	139		50-150		%	1		08/10/21 22:52

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/10/21 22:52
Container ID: 1214864003-B

Prep Batch: VXX37618
Prep Method: SW5035A
Prep Date/Time: 08/03/21 08:40
Prep Initial Wt./Vol.: 41.927 g
Prep Extract Vol: 31.2501 mL

Results of **2-15-S-01**

Client Sample ID: **2-15-S-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864003
Lab Project ID: 1214864

Collection Date: 08/03/21 08:40
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):85.1
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	43.8	U	87.6	26.3	ug/kg	1		08/12/21 16:27
1,2-Dibromoethane	0.875	U	1.75	0.701	ug/kg	1		08/12/21 16:27
1,2-Dichloroethane	1.75	U	3.50	1.23	ug/kg	1		08/12/21 16:27
1,3,5-Trimethylbenzene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
Benzene	10.9	U	21.9	6.83	ug/kg	1		08/12/21 16:27
Ethylbenzene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
Isopropylbenzene (Cumene)	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
Methyl-t-butyl ether	87.5	U	175	54.3	ug/kg	1		08/12/21 16:27
Naphthalene	488		43.8	13.7	ug/kg	1		08/12/21 16:27
n-Butylbenzene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
o-Xylene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
P & M -Xylene	43.8	U	87.6	26.3	ug/kg	1		08/12/21 16:27
sec-Butylbenzene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
tert-Butylbenzene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
Toluene	21.9	U	43.8	13.7	ug/kg	1		08/12/21 16:27
Xylenes (total)	65.5	U	131	39.9	ug/kg	1		08/12/21 16:27
Surrogates								
1,2-Dichloroethane-D4 (surr)	102		71-136		%	1		08/12/21 16:27
4-Bromofluorobenzene (surr)	97		55-151		%	1		08/12/21 16:27
Toluene-d8 (surr)	101		85-116		%	1		08/12/21 16:27

Batch Information

Analytical Batch: VMS21049
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/12/21 16:27
Container ID: 1214864003-B

Prep Batch: VXX37637
Prep Method: SW5035A
Prep Date/Time: 08/03/21 08:40
Prep Initial Wt./Vol.: 41.927 g
Prep Extract Vol: 31.2501 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-FL-01**

Client Sample ID: **2-15-FL-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864004
Lab Project ID: 1214864

Collection Date: 08/03/21 09:05
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Metals by ICP/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Arsenic	10.1		1.05	0.327	mg/kg	10		08/14/21 05:29
Barium	136		0.316	0.0990	mg/kg	10		08/14/21 05:29
Cadmium	0.177	J	0.211	0.0653	mg/kg	10		08/14/21 05:29
Chromium	29.7		1.05	0.327	mg/kg	10		08/17/21 16:26
Lead	5.71		0.211	0.0653	mg/kg	10		08/14/21 12:37
Mercury	0.158	U	0.316	0.105	mg/kg	10		08/14/21 05:29
Selenium	1.05	U	2.11	0.653	mg/kg	10		08/14/21 05:29
Silver	0.264	U	0.527	0.158	mg/kg	10		08/14/21 05:29

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 05:29
Container ID: 1214864004-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.078 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/14/21 12:37
Container ID: 1214864004-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.078 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11252
Analytical Method: SW6020B
Analyst: ACF
Analytical Date/Time: 08/17/21 16:26
Container ID: 1214864004-A

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 08/10/21 08:18
Prep Initial Wt./Vol.: 1.078 g
Prep Extract Vol: 50 mL

Results of **2-15-FL-01**

Client Sample ID: **2-15-FL-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864004
Lab Project ID: 1214864

Collection Date: 08/03/21 09:05
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	20200		1410	353	ug/kg	50		08/14/21 21:18
2-Methylnaphthalene	28300		2830	706	ug/kg	100		08/16/21 13:42
Acenaphthene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Acenaphthylene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Anthracene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Benzo(a)Anthracene	113 J		141	35.3	ug/kg	5		08/14/21 05:16
Benzo[a]pyrene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Benzo[b]Fluoranthene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Benzo[g,h,i]perylene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Benzo[k]fluoranthene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Chrysene	324		141	35.3	ug/kg	5		08/14/21 05:16
Dibenzo[a,h]anthracene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Fluoranthene	138 J		141	35.3	ug/kg	5		08/14/21 05:16
Fluorene	1150		141	35.3	ug/kg	5		08/14/21 05:16
Indeno[1,2,3-c,d] pyrene	70.5 U		141	35.3	ug/kg	5		08/14/21 05:16
Naphthalene	10600		1130	283	ug/kg	50		08/14/21 21:18
Phenanthrene	2440		141	35.3	ug/kg	5		08/14/21 05:16
Pyrene	139 J		141	35.3	ug/kg	5		08/14/21 05:16
Surrogates								
2-Methylnaphthalene-d10 (surr)	122	*	58-103		%	5		08/14/21 05:16
Fluoranthene-d10 (surr)	105		54-113		%	5		08/14/21 05:16

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-FL-01**

Client Sample ID: **2-15-FL-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864004
Lab Project ID: 1214864

Collection Date: 08/03/21 09:05
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Polynuclear Aromatics GC/MS**

Batch Information

Analytical Batch: XMS12825
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/14/21 05:16
Container ID: 1214864004-A

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 08/07/21 12:59
Prep Initial Wt./Vol.: 22.609 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS12831
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/16/21 13:42
Container ID: 1214864004-A

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 08/07/21 12:59
Prep Initial Wt./Vol.: 22.609 g
Prep Extract Vol: 5 mL

Analytical Batch: XMS12821
Analytical Method: 8270D SIM (PAH)
Analyst: LAW
Analytical Date/Time: 08/14/21 21:18
Container ID: 1214864004-A

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 08/07/21 12:59
Prep Initial Wt./Vol.: 22.609 g
Prep Extract Vol: 5 mL

Results of **2-15-FL-01**

Client Sample ID: **2-15-FL-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864004
Lab Project ID: 1214864

Collection Date: 08/03/21 09:05
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	5910		113	35.1	mg/kg	5		08/10/21 00:25
Surrogates								
5a Androstane (surr)	134		50-150		%	5		08/10/21 00:25

Batch Information

Analytical Batch: XFC16036
Analytical Method: AK102
Analyst: IVM
Analytical Date/Time: 08/10/21 00:25
Container ID: 1214864004-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.079 g
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Residual Range Organics	2950		113	48.7	mg/kg	1		08/09/21 00:34
Surrogates								
n-Triacontane-d62 (surr)	88.4		50-150		%	1		08/09/21 00:34

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK103
Analyst: IVM
Analytical Date/Time: 08/09/21 00:34
Container ID: 1214864004-A

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 08/06/21 18:48
Prep Initial Wt./Vol.: 30.079 g
Prep Extract Vol: 5 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **2-15-FL-01**

Client Sample ID: **2-15-FL-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864004
Lab Project ID: 1214864

Collection Date: 08/03/21 09:05
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	419		17.7	5.30	mg/kg	5		08/10/21 21:04
Surrogates								
4-Bromofluorobenzene (surr)	2640	*	50-150		%	5		08/10/21 21:04

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/10/21 21:04
Container ID: 1214864004-C

Prep Batch: VXX37618
Prep Method: SW5035A
Prep Date/Time: 08/03/21 09:05
Prep Initial Wt./Vol.: 49.719 g
Prep Extract Vol: 30.9452 mL

Results of **2-15-FL-01**

Client Sample ID: **2-15-FL-01**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864004
Lab Project ID: 1214864

Collection Date: 08/03/21 09:05
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):88.0
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	10700		1410	424	ug/kg	20		08/13/21 16:08
1,2-Dibromoethane	14.2	U	28.3	11.3	ug/kg	20		08/13/21 16:08
1,2-Dichloroethane	28.3	U	56.6	19.8	ug/kg	20		08/13/21 16:08
1,3,5-Trimethylbenzene	1200		707	221	ug/kg	20		08/13/21 16:08
Benzene	177	U	353	110	ug/kg	20		08/13/21 16:08
Ethylbenzene	2230		707	221	ug/kg	20		08/13/21 16:08
Isopropylbenzene (Cumene)	1580		707	221	ug/kg	20		08/13/21 16:08
Methyl-t-butyl ether	1415	U	2830	877	ug/kg	20		08/13/21 16:08
Naphthalene	9030		707	221	ug/kg	20		08/13/21 16:08
n-Butylbenzene	354	U	707	221	ug/kg	20		08/13/21 16:08
o-Xylene	290	J	707	221	ug/kg	20		08/13/21 16:08
P & M -Xylene	1630		1410	424	ug/kg	20		08/13/21 16:08
sec-Butylbenzene	2010		707	221	ug/kg	20		08/13/21 16:08
tert-Butylbenzene	226	J	707	221	ug/kg	20		08/13/21 16:08
Toluene	354	U	707	221	ug/kg	20		08/13/21 16:08
Xylenes (total)	1920	J	2120	645	ug/kg	20		08/13/21 16:08
Surrogates								
1,2-Dichloroethane-D4 (surr)	99.3		71-136		%	20		08/13/21 16:08
4-Bromofluorobenzene (surr)	144		55-151		%	20		08/13/21 16:08
Toluene-d8 (surr)	102		85-116		%	20		08/13/21 16:08

Batch Information

Analytical Batch: VMS21052
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/13/21 16:08
Container ID: 1214864004-C

Prep Batch: VXX37640
Prep Method: SW5035A
Prep Date/Time: 08/03/21 09:05
Prep Initial Wt./Vol.: 49.719 g
Prep Extract Vol: 30.9452 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864007
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
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	1.27	U	2.53	0.759	mg/kg	1		08/10/21 19:33
Surrogates								
4-Bromofluorobenzene (surr)	91.8		50-150		%	1		08/10/21 19:33

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Analyst: MDT
Analytical Date/Time: 08/10/21 19:33
Container ID: 1214864007-A

Prep Batch: VXX37618
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:45
Prep Initial Wt./Vol.: 49.389 g
Prep Extract Vol: 25 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **TS2-15 Trenching**
Lab Sample ID: 1214864007
Lab Project ID: 1214864

Collection Date: 08/03/21 07:45
Received Date: 08/04/21 12:14
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS- Petroleum VOC Group**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2,4-Trimethylbenzene	25.3	U	50.6	15.2	ug/kg	1		08/12/21 15:05
1,2-Dibromoethane	0.505	U	1.01	0.405	ug/kg	1		08/12/21 15:05
1,2-Dichloroethane	1.01	U	2.02	0.709	ug/kg	1		08/12/21 15:05
1,3,5-Trimethylbenzene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
Benzene	6.35	U	12.7	3.95	ug/kg	1		08/12/21 15:05
Ethylbenzene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
Isopropylbenzene (Cumene)	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
Methyl-t-butyl ether	50.5	U	101	31.4	ug/kg	1		08/12/21 15:05
Naphthalene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
n-Butylbenzene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
o-Xylene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
P & M -Xylene	25.3	U	50.6	15.2	ug/kg	1		08/12/21 15:05
sec-Butylbenzene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
tert-Butylbenzene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
Toluene	12.7	U	25.3	7.90	ug/kg	1		08/12/21 15:05
Xylenes (total)	38.0	U	75.9	23.1	ug/kg	1		08/12/21 15:05
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		71-136		%	1		08/12/21 15:05
4-Bromofluorobenzene (surr)	94.1		55-151		%	1		08/12/21 15:05
Toluene-d8 (surr)	101		85-116		%	1		08/12/21 15:05

Batch Information

Analytical Batch: VMS21049
Analytical Method: SW8260D
Analyst: S.S
Analytical Date/Time: 08/12/21 15:05
Container ID: 1214864007-A

Prep Batch: VXX37637
Prep Method: SW5035A
Prep Date/Time: 08/03/21 07:45
Prep Initial Wt./Vol.: 49.389 g
Prep Extract Vol: 25 mL

Print Date: 08/20/2021 3:30:05PM

J flagging is activated

Method Blank

Blank ID: MB for HBN 1823796 [MXX/34510]
Blank Lab ID: 1628895

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

Results by **SW6020B**

Parameter	Results	LOQ/CL	DL	Units
Arsenic	0.500U	1.00	0.310	mg/kg
Barium	0.150U	0.300	0.0940	mg/kg
Cadmium	0.100U	0.200	0.0620	mg/kg
Chromium	0.500U	1.00	0.310	mg/kg
Lead	0.100U	0.200	0.0620	mg/kg
Mercury	0.150U	0.300	0.100	mg/kg
Selenium	1.00U	2.00	0.620	mg/kg
Silver	0.250U	0.500	0.150	mg/kg

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 5:21:00AM

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 12:20:19PM

Prep Batch: MXX34510
Prep Method: SW3050B
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214864 [MXX34510]
Blank Spike Lab ID: 1628896
Date Analyzed: 08/14/2021 05:25

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004

Results by **SW6020B**

Blank Spike (mg/kg)

Parameter	Spike	Result	Rec (%)	CL
Arsenic	50	52.5	105	(82-118)
Barium	50	46.7	93	(86-116)
Cadmium	5	5.15	103	(84-116)
Mercury	0.5	0.508	102	(74-126)
Selenium	50	53.4	107	(80-119)
Silver	5	5.58	112	(83-118)
Chromium	20	20.6	103	(83-119)
Lead	50	55.1	110	(84-118)

Batch Information

Analytical Batch: **MMS11246**
Analytical Method: **SW6020B**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **ACF**

Prep Batch: **MXX34510**
Prep Method: **SW3050B**
Prep Date/Time: **08/10/2021 08:18**
Spike Init Wt./Vol.: 50 mg/kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

Analytical Batch: **MMS11247**
Analytical Method: **SW6020B**
Instrument: **Perkin Elmer Nexlon P5**
Analyst: **ACF**

Prep Batch: **MXX34510**
Prep Method: **SW3050B**
Prep Date/Time: **08/10/2021 08:18**
Spike Init Wt./Vol.: 20 mg/kg Extract Vol: 50 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1628897
MS Sample ID: 1628899 MS
MSD Sample ID: 1628900 MSD

Analysis Date: 08/14/2021 5:29
Analysis Date: 08/14/2021 5:34
Analysis Date: 08/14/2021 5:38
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004

Results by **SW6020B**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Arsenic	8.87	49.9	61.6	106	45.7	56.3	104	82-118	9.10	(< 20)
Barium	120	49.9	181	122 *	45.7	171	112	86-116	5.61	(< 20)
Cadmium	0.156J	4.99	5.32	104	4.57	4.84	103	84-116	9.34	(< 20)
Mercury	0.139U	0.499	.522	105	0.457	0.543	119	74-126	4.04	(< 20)
Selenium	0.930U	49.9	52.3	105	45.7	47.3	104	80-119	9.93	(< 20)
Silver	0.232U	4.99	4.52	91	4.57	3.95	87	83-118	13.50	(< 20)
Lead	5.03	49.9	58.6	107	45.7	52.0	103	84-118	11.90	(< 20)
Chromium	26.2	19.9	49.1	115	18.3	47.9	119	83-119	2.49	(< 20)

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 5:34:00AM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 12:41:00PM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

Analytical Batch: MMS11252
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/17/2021 4:30:00PM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

Bench Spike Summary

Original Sample ID: 1628897
MS Sample ID: 1628898 BND
MSD Sample ID:

Analysis Date: 08/14/2021 5:29
Analysis Date: 08/14/2021 5:42
Analysis Date:
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004

Results by **SW6020B**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Barium	120	232	389	116				75-125		
Lead	5.03	116	124	102				75-125		

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 5:42:00AM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.08g
Prep Extract Vol: 50.00mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 12:50:00PM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.08g
Prep Extract Vol: 50.00mL

Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date: 08/14/2021 5:29
Analysis Date: 08/14/2021 5:34
Analysis Date: 08/14/2021 5:38
Matrix: Soil/Solid (dry weight)

QC for Samples:

Results by **SW6020B**

		Matrix Spike (mg/kg)				Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Arsenic	10.1	56.7	70.0	106		51.9	64.0	104	82-118	9.10	(< 20)
Barium	136	56.7	206	122	*	51.9	194	112	86-116	5.61	(< 20)
Cadmium	0.177J	5.67	6.05	104		5.19	5.50	103	84-116	9.34	(< 20)
Mercury	0.158U	0.567	0.593	105		0.519	0.617	119	74-126	4.04	(< 20)
Selenium	1.05U	56.7	59.4	105		51.9	53.8	104	80-119	9.93	(< 20)
Silver	0.264U	5.67	5.14	91		5.19	4.49	87	83-118	13.50	(< 20)
Lead	5.71	56.7	66.6	107		51.9	59.1	103	84-118	11.90	(< 20)
Chromium	29.7	22.6	55.8	115		20.8	54.4	119	83-119	2.49	(< 20)

Batch Information

Analytical Batch: MMS11246
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 5:34:00AM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

Analytical Batch: MMS11247
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/14/2021 12:41:00PM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

Analytical Batch: MMS11252
Analytical Method: SW6020B
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 8/17/2021 4:30:00PM

Prep Batch: MXX34510
Prep Method: Soils/Solids Digest for Metals by ICP-MS
Prep Date/Time: 8/10/2021 8:18:48AM
Prep Initial Wt./Vol.: 1.00g
Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1823745 [SPT/11343]
Blank Lab ID: 1628684

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT11343
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM
Analytical Date/Time: 8/6/2021 6:00:00PM

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Duplicate Sample Summary

Original Sample ID: 1214757111
Duplicate Sample ID: 1628686
QC for Samples:

Analysis Date: 08/06/2021 18:00
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	83.3	83.4	%	0.06	(< 15)

Batch Information

Analytical Batch: SPT11343
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 08/20/2021 3:30:14PM

Duplicate Sample Summary

Original Sample ID: 1214782007
Duplicate Sample ID: 1628687
QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

Analysis Date: 08/06/2021 18:00
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	84.6	85.1	%	0.52	(< 15)

Batch Information

Analytical Batch: SPT11343
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 08/20/2021 3:30:14PM

Duplicate Sample Summary

Original Sample ID: 1214871005
Duplicate Sample ID: 1628688
QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

Analysis Date: 08/06/2021 18:00
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	97.1	97.3	%	0.17	(< 15)

Batch Information

Analytical Batch: SPT11343
Analytical Method: SM21 2540G
Instrument:
Analyst: TMM

Print Date: 08/20/2021 3:30:14PM

Method Blank

Blank ID: MB for HBN 1823912 [VXX/37618]
Blank Lab ID: 1629324

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004, 1214864007

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.814J	2.50	0.750	mg/kg
Surrogates				
4-Bromofluorobenzene (surr)	87.5	50-150		%

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/10/2021 6:39:00PM

Prep Batch: VXX37618
Prep Method: SW5035A
Prep Date/Time: 8/10/2021 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 1214864 [VXX37618]
Blank Spike Lab ID: 1629325
Date Analyzed: 08/10/2021 18:03

Spike Duplicate ID: LCSD for HBN 1214864 [VXX37618]
Spike Duplicate Lab ID: 1629326
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004, 1214864007

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	14.2	114	12.5	13.8	111	(60-120)	2.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25		93	1.25		97	(50-150)	3.70	

Batch Information

Analytical Batch: **VFC15759**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **MDT**

Prep Batch: **VXX37618**
Prep Method: **SW5035A**
Prep Date/Time: **08/10/2021 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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Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date: 08/10/2021 21:04
Analysis Date: 08/10/2021 21:22
Analysis Date: 08/10/2021 21:40
Matrix: Soil/Solid (dry weight)

QC for Samples:

Results by **AK101**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	419	17.6	472	298 *	17.6	445	151 *	60-120	5.60	(< 20)
Surrogates										
4-Bromofluorobenzene (surr)		1.43	34.1	2390 *	1.43	31.6	2210 *	50-150	7.50	

Batch Information

Analytical Batch: VFC15759
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: MDT
Analytical Date/Time: 8/10/2021 9:22:00PM

Prep Batch: VXX37618
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/3/2021 9:05:00AM
Prep Initial Wt./Vol.: 49.72g
Prep Extract Vol: 30.95mL

Print Date: 08/20/2021 3:30:23PM

Method Blank

Blank ID: MB for HBN 1824045 [VXX/37637]
Blank Lab ID: 1629916

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864007

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/kg
1,2-Dibromoethane	0.500U	1.00	0.400	ug/kg
1,2-Dichloroethane	1.00U	2.00	0.700	ug/kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/kg
Benzene	6.25U	12.5	3.90	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	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
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
tert-Butylbenzene	12.5U	25.0	7.80	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)	107	71-136		%
4-Bromofluorobenzene (surr)	97.1	55-151		%
Toluene-d8 (surr)	101	85-116		%

Batch Information

Analytical Batch: VMS21049
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/12/2021 11:43:00AM

Prep Batch: VXX37637
Prep Method: SW5035A
Prep Date/Time: 8/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214864 [VXX37637]
Blank Spike Lab ID: 1629917
Date Analyzed: 08/12/2021 11:59

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864007

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	760	101	(75-123)
1,2-Dibromoethane	750	822	110	(78-122)
1,2-Dichloroethane	750	694	93	(73-128)
1,3,5-Trimethylbenzene	750	761	101	(73-124)
Benzene	750	756	101	(77-121)
Ethylbenzene	750	720	96	(76-122)
Isopropylbenzene (Cumene)	750	739	99	(68-134)
Methyl-t-butyl ether	1130	1140	102	(73-125)
Naphthalene	750	771	103	(62-129)
n-Butylbenzene	750	744	99	(70-128)
o-Xylene	750	747	100	(77-123)
P & M -Xylene	1500	1420	95	(77-124)
sec-Butylbenzene	750	715	95	(73-126)
tert-Butylbenzene	750	736	98	(73-125)
Toluene	750	740	99	(77-121)
Xylenes (total)	2250	2170	96	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750		94	(71-136)
4-Bromofluorobenzene (surr)	750		95	(55-151)
Toluene-d8 (surr)	750		99	(85-116)

Batch Information

Analytical Batch: **VMS21049**
Analytical Method: **SW8260D**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **S.S**

Prep Batch: **VXX37637**
Prep Method: **SW5035A**
Prep Date/Time: **08/12/2021 06:00**
Spike Init Wt./Vol.: 750 ug/kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/20/2021 3:30:27PM

Matrix Spike Summary

Original Sample ID: 1629919
MS Sample ID: 1629920 MS
MSD Sample ID: 1629921 MSD

Analysis Date: 08/12/2021 15:38
Analysis Date: 08/12/2021 13:26
Analysis Date: 08/12/2021 13:42
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864007

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	1360	754	5920	605 *	754	5380	533 *	75-123	9.60	(< 20)
1,2-Dibromoethane	0.505U	754	843	112	754	830	110	78-122	1.50	(< 20)
1,2-Dichloroethane	1.00U	754	696	92	754	684	91	73-128	1.70	(< 20)
1,3,5-Trimethylbenzene	154	754	1350	158 *	754	1220	142 *	73-124	9.50	(< 20)
Benzene	6.30U	754	753	100	754	731	97	77-121	2.90	(< 20)
Ethylbenzene	305	754	2040	230 *	754	1970	221 *	76-122	3.40	(< 20)
Isopropylbenzene (Cumene)	218	754	1680	193 *	754	1590	182 *	68-134	5.10	(< 20)
Methyl-t-butyl ether	50.5U	1130	1190	105	1130	1190	105	73-125	0.25	(< 20)
Naphthalene	1240	754	6120	647 *	754	5640	583 *	62-129	8.30	(< 20)
n-Butylbenzene	12.6U	754	493	65 *	754	2380	316 *	70-128	131.00 *	(< 20)
o-Xylene	37.7	754	864	110	754	838	106	77-123	3.10	(< 20)
P & M -Xylene	222	1510	2420	145 *	1510	2310	139 *	77-124	4.40	(< 20)
sec-Butylbenzene	252	754	2030	235 *	754	1790	203 *	73-126	12.50	(< 20)
tert-Butylbenzene	28.2	754	796	102	754	704	90	73-125	12.20	(< 20)
Toluene	12.6U	754	738	98	754	720	96	77-121	2.40	(< 20)
Xylenes (total)	259	2260	3280	133 *	2260	3150	128 *	78-124	4.10	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		754	721	96	754	709	94	71-136	1.70	
4-Bromofluorobenzene (surr)		1260	1110	88	1260	1040	83	55-151	6.30	
Toluene-d8 (surr)		754	1120	149 *	754	1090	145 *	85-116	2.50	

Batch Information

Analytical Batch: VMS21049
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/12/2021 1:26:00PM

Prep Batch: VXX37637
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/12/2021 6:00:00AM
Prep Initial Wt./Vol.: 49.72g
Prep Extract Vol: 25.00mL

Print Date: 08/20/2021 3:30:28PM

Method Blank

Blank ID: MB for HBN 1824135 [VXX/37640]
Blank Lab ID: 1630209

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864004

Results by **SW8260D**

Parameter	Results	LOQ/CL	DL	Units
1,2,4-Trimethylbenzene	25.0U	50.0	15.0	ug/kg
1,2-Dibromoethane	0.500U	1.00	0.400	ug/kg
1,2-Dichloroethane	1.00U	2.00	0.700	ug/kg
1,3,5-Trimethylbenzene	12.5U	25.0	7.80	ug/kg
Benzene	6.25U	12.5	3.90	ug/kg
Ethylbenzene	12.5U	25.0	7.80	ug/kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	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
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
tert-Butylbenzene	12.5U	25.0	7.80	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)	113	71-136		%
4-Bromofluorobenzene (surr)	99	55-151		%
Toluene-d8 (surr)	99.6	85-116		%

Batch Information

Analytical Batch: VMS21052
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/13/2021 11:31:00AM

Prep Batch: VXX37640
Prep Method: SW5035A
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 08/20/2021 3:30:30PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214864 [VXX37640]
Blank Spike Lab ID: 1630210
Date Analyzed: 08/13/2021 11:48

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864004

Results by **SW8260D**

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1,2,4-Trimethylbenzene	750	752	100	(75-123)
1,2-Dibromoethane	750	832	111	(78-122)
1,2-Dichloroethane	750	700	93	(73-128)
1,3,5-Trimethylbenzene	750	750	100	(73-124)
Benzene	750	750	100	(77-121)
Ethylbenzene	750	712	95	(76-122)
Isopropylbenzene (Cumene)	750	734	98	(68-134)
Methyl-t-butyl ether	1130	1110	99	(73-125)
Naphthalene	750	783	104	(62-129)
n-Butylbenzene	750	733	98	(70-128)
o-Xylene	750	743	99	(77-123)
P & M -Xylene	1500	1410	94	(77-124)
sec-Butylbenzene	750	699	93	(73-126)
tert-Butylbenzene	750	723	96	(73-125)
Toluene	750	739	99	(77-121)
Xylenes (total)	2250	2160	96	(78-124)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750		95	(71-136)
4-Bromofluorobenzene (surr)	750		95	(55-151)
Toluene-d8 (surr)	750		100	(85-116)

Batch Information

Analytical Batch: **VMS21052**
Analytical Method: **SW8260D**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **S.S**

Prep Batch: **VXX37640**
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:

Print Date: 08/20/2021 3:30:33PM

Matrix Spike Summary

Original Sample ID: 1630213
MS Sample ID: 1630214 MS
MSD Sample ID: 1630215 MSD

Analysis Date: 08/13/2021 16:08
Analysis Date: 08/13/2021 13:40
Analysis Date: 08/13/2021 13:56
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1214864001, 1214864002, 1214864004

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	9450	18700	27900	99	18700	27700	98	75-123	0.81	(< 20)
1,2-Dibromoethane	12.4U	18700	21600	115	18700	21600	116	78-122	0.03	(< 20)
1,2-Dichloroethane	24.9U	18700	17900	96	18700	17700	94	73-128	1.10	(< 20)
1,3,5-Trimethylbenzene	1060	18700	19100	97	18700	18800	95	73-124	1.50	(< 20)
Benzene	156U	18700	19300	103	18700	18900	101	77-121	1.90	(< 20)
Ethylbenzene	1960	18700	19600	95	18700	19300	93	76-122	1.90	(< 20)
Isopropylbenzene (Cumene)	1390	18700	19600	97	18700	19200	95	68-134	2.20	(< 20)
Methyl-t-butyl ether	1245U	28100	29900	107	28100	29300	104	73-125	2.20	(< 20)
Naphthalene	7950	18700	29500	115	18700	30600	121	62-129	3.50	(< 20)
n-Butylbenzene	311U	18700	20000	107	18700	19700	106	70-128	1.40	(< 20)
o-Xylene	255J	18700	18900	100	18700	18600	98	77-123	1.70	(< 20)
P & M -Xylene	1430	37400	36400	93	37400	35800	92	77-124	1.70	(< 20)
sec-Butylbenzene	1770	18700	18500	90	18700	18300	88	73-126	1.60	(< 20)
tert-Butylbenzene	199J	18700	17700	94	18700	17500	92	73-125	1.20	(< 20)
Toluene	311U	18700	18800	100	18700	18400	98	77-121	2.00	(< 20)
Xylenes (total)	1690J	56100	55300	96	56100	54400	94	78-124	1.70	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		18700	17700	95	18700	17700	95	71-136	0.07	
4-Bromofluorobenzene (surr)		1260	1650	131	1260	1570	125	55-151	4.60	
Toluene-d8 (surr)		18700	18900	101	18700	18700	100	85-116	1.10	

Batch Information

Analytical Batch: VMS21052
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/13/2021 1:40:00PM

Prep Batch: VXX37640
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/13/2021 6:00:00AM
Prep Initial Wt./Vol.: 49.72g
Prep Extract Vol: 30.95mL

Print Date: 08/20/2021 3:30:35PM

Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date: 08/13/2021 16:08
Analysis Date: 08/13/2021 13:40
Analysis Date: 08/13/2021 13:56
Matrix: Soil/Solid (dry weight)

QC for Samples:

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	10700	21250	31705	99	21250	31477	98	75-123	0.81	(< 20)
1,2-Dibromoethane	14.2U	21250	24545	115	21250	24545	116	78-122	0.03	(< 20)
1,2-Dichloroethane	28.3U	21250	20341	96	21250	20114	94	73-128	1.10	(< 20)
1,3,5-Trimethylbenzene	1200	21250	21705	97	21250	21364	95	73-124	1.50	(< 20)
Benzene	177U	21250	21932	103	21250	21477	101	77-121	1.90	(< 20)
Ethylbenzene	2230	21250	22273	95	21250	21932	93	76-122	1.90	(< 20)
Isopropylbenzene (Cumene)	1580	21250	22273	97	21250	21818	95	68-134	2.20	(< 20)
Methyl-t-butyl ether	1415U	31932	33977	107	31932	33295	104	73-125	2.20	(< 20)
Naphthalene	9030	21250	33523	115	21250	34773	121	62-129	3.50	(< 20)
n-Butylbenzene	354U	21250	22727	107	21250	22386	106	70-128	1.40	(< 20)
o-Xylene	290J	21250	21477	100	21250	21136	98	77-123	1.70	(< 20)
P & M -Xylene	1630	42500	41364	93	42500	40682	92	77-124	1.70	(< 20)
sec-Butylbenzene	2010	21250	21023	90	21250	20795	88	73-126	1.60	(< 20)
tert-Butylbenzene	226J	21250	20114	94	21250	19886	92	73-125	1.20	(< 20)
Toluene	354U	21250	21364	100	21250	20909	98	77-121	2.00	(< 20)
Xylenes (total)	1920J	63750	62841	96	63750	61818	94	78-124	1.70	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		21250	20114	95	21250	20114	95	71-136	0.07	
4-Bromofluorobenzene (surr)		1432	1875	131	1432	1784	125	55-151	4.60	
Toluene-d8 (surr)		21250	21477	101	21250	21250	100	85-116	1.10	

Batch Information

Analytical Batch: VMS21052
Analytical Method: SW8260D
Instrument: VQA 7890/5975 GC/MS
Analyst: S.S
Analytical Date/Time: 8/13/2021 1:40:00PM

Prep Batch: VXX37640
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 8/3/2021 9:05:00AM
Prep Initial Wt./Vol.: 49.72g
Prep Extract Vol: 30.95mL

Print Date: 08/20/2021 3:30:35PM

Method Blank

Blank ID: MB for HBN 1823665 [XXX/45331]
Blank Lab ID: 1628550

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/kg
Surrogates				
5a Androstane (surr)	97.4	60-120		%

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 8/8/2021 10:27:00PM

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 8/6/2021 6:48:42PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214864 [XXX45331]
Blank Spike Lab ID: 1628551
Date Analyzed: 08/08/2021 22:37

Spike Duplicate ID: LCSD for HBN 1214864 [XXX45331]
Spike Duplicate Lab ID: 1628552
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004

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	711	107	667	701	105	(75-125)	1.50	(< 20)
Surrogates									
5a Androstane (surr)	16.7		103	16.7		101	(60-120)	2.10	

Batch Information

Analytical Batch: **XFC16033**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **IVM**

Prep Batch: **XXX45331**
Prep Method: **SW3550C**
Prep Date/Time: **08/06/2021 18:48**
Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date: 08/10/2021 0:25
Analysis Date: 08/10/2021 0:34
Analysis Date: 08/10/2021 0:44
Matrix: Soil/Solid (dry weight)

QC for Samples:

Results by **AK102**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	5910	753	6534	83	749	5659	-33 *	60-140	14.30	(< 50)
Surrogates										
5a Androstane (surr)		18.9	26.7	142	18.8	23.6	127	50-150	12.10	

Batch Information

Analytical Batch: XFC16036
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 8/10/2021 12:34:00AM

Prep Batch: XXX45331
Prep Method: Sonication Extraction Soil AK102
Prep Date/Time: 8/6/2021 6:48:42PM
Prep Initial Wt./Vol.: 30.18g
Prep Extract Vol: 5.00mL

Print Date: 08/20/2021 3:30:40PM

Method Blank

Blank ID: MB for HBN 1823665 [XXX/45331]
Blank Lab ID: 1628550

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	50.0U	100	43.0	mg/kg
Surrogates				
n-Triacontane-d62 (surr)	95.7	60-120		%

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 8/8/2021 10:27:00PM

Prep Batch: XXX45331
Prep Method: SW3550C
Prep Date/Time: 8/6/2021 6:48:42PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214864 [XXX45331]
Blank Spike Lab ID: 1628551
Date Analyzed: 08/08/2021 22:37

Spike Duplicate ID: LCSD for HBN 1214864 [XXX45331]
Spike Duplicate Lab ID: 1628552
Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004

Results by **AK103**

	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	667	703	105	667	696	104	(60-120)	0.91	(< 20)
Surrogates									
n-Triacontane-d62 (surr)	16.7		101	16.7		97	(60-120)	4.60	

Batch Information

Analytical Batch: **XFC16033**
Analytical Method: **AK103**
Instrument: **Agilent 7890B F**
Analyst: **IVM**

Prep Batch: **XXX45331**
Prep Method: **SW3550C**
Prep Date/Time: **08/06/2021 18:48**
Spike Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: 667 mg/kg Extract Vol: 5 mL

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

Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date: 08/09/2021 0:34
Analysis Date: 08/09/2021 0:44
Analysis Date: 08/09/2021 0:54
Matrix: Soil/Solid (dry weight)

QC for Samples:

Results by **AK103**

		Matrix Spike (mg/kg)			Spike Duplicate (mg/kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	2950	753	3534	78	749	3091	18 *	60-140	13.70	(< 50)
Surrogates										
n-Triacontane-d62 (surr)		18.9	17.6	93	18.8	15.6	83	50-150	12.30	

Batch Information

Analytical Batch: XFC16033
Analytical Method: AK103
Instrument: Agilent 7890B F
Analyst: IVM
Analytical Date/Time: 8/9/2021 12:44:00AM

Prep Batch: XXX45331
Prep Method: Sonication Extraction Soil AK102
Prep Date/Time: 8/6/2021 6:48:42PM
Prep Initial Wt./Vol.: 30.18g
Prep Extract Vol: 5.00mL

Print Date: 08/20/2021 3:30:46PM

Method Blank

Blank ID: MB for HBN 1823678 [XXX/45334]
Blank Lab ID: 1628594

Matrix: Soil/Solid (dry weight)

QC for Samples:
1214864001, 1214864002, 1214864003, 1214864004

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)	94.7	58-103		%
Fluoranthene-d10 (surr)	96.5	54-113		%

Batch Information

Analytical Batch: XMS12825
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/14/2021 1:10:00AM

Prep Batch: XXX45334
Prep Method: SW3550C
Prep Date/Time: 8/7/2021 12:59:26PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1214864 [XXX45334]
Blank Spike Lab ID: 1628595
Date Analyzed: 08/14/2021 01:30

Matrix: Soil/Solid (dry weight)

QC for Samples: 1214864001, 1214864002, 1214864003, 1214864004

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

Blank Spike (ug/kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	99.0	89	(43-111)
2-Methylnaphthalene	111	97.1	87	(39-114)
Acenaphthene	111	99.3	89	(44-111)
Acenaphthylene	111	98.5	89	(39-116)
Anthracene	111	98.5	89	(50-114)
Benzo(a)Anthracene	111	98.4	89	(54-122)
Benzo[a]pyrene	111	99.0	89	(50-125)
Benzo[b]Fluoranthene	111	101	91	(53-128)
Benzo[g,h,i]perylene	111	102	92	(49-127)
Benzo[k]fluoranthene	111	104	94	(56-123)
Chrysene	111	102	92	(57-118)
Dibenzo[a,h]anthracene	111	103	93	(50-129)
Fluoranthene	111	103	93	(55-119)
Fluorene	111	99.3	89	(47-114)
Indeno[1,2,3-c,d] pyrene	111	101	91	(49-130)
Naphthalene	111	97.1	87	(38-111)
Phenanthrene	111	102	91	(49-113)
Pyrene	111	100	90	(55-117)
Surrogates				
2-Methylnaphthalene-d10 (surr)	111		92	(58-103)
Fluoranthene-d10 (surr)	111		92	(54-113)

Batch Information

Analytical Batch: **XMS12825**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **LAW**

Prep Batch: **XXX45334**
Prep Method: **SW3550C**
Prep Date/Time: **08/07/2021 12:59**
Spike Init Wt./Vol.: 111 ug/kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date: 08/14/2021 21:18
Analysis Date: 08/14/2021 21:39
Analysis Date: 08/14/2021 21:59
Matrix: Soil/Solid (dry weight)

QC for Samples:

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	20200	125	23182	2360	*	126	25682	4360	*	43-111	10.30	(< 20)
Naphthalene	10600	125	12159	1280	*	126	13409	2210	*	38-111	9.20	(< 20)
Acenaphthene	70.5U	125	395	316	*	126	428	341	*	44-111	7.90	(< 20)
Acenaphthylene	70.5U	125	377	301	*	126	399	317	*	39-116	5.50	(< 20)
Anthracene	70.5U	125	191	153	*	126	209	167	*	50-114	9.20	(< 20)
Benzo(a)Anthracene	113J	125	244	105		126	261	118		54-122	6.60	(< 20)
Benzo[a]pyrene	70.5U	125	156	124		126	160	127	*	50-125	3.10	(< 20)
Benzo[b]Fluoranthene	70.5U	125	176	141	*	126	192	153	*	53-128	8.30	(< 20)
Benzo[g,h,i]perylene	70.5U	125	145	116		126	149	119		49-127	2.40	(< 20)
Benzo[k]fluoranthene	70.5U	125	105J	84		126	112J	89		56-123	6.30	(< 20)
Chrysene	324	125	463	111		126	514	150	*	57-118	10.30	(< 20)
Dibenzo[a,h]anthracene	70.5U	125	135J	108		126	141	112		50-129	4.20	(< 20)
Fluoranthene	138J	125	265	101		126	292	122	*	55-119	9.70	(< 20)
Fluorene	1150	125	1284	113		126	1432	228	*	47-114	10.70	(< 20)
Indeno[1,2,3-c,d] pyrene	70.5U	125	123J	98		126	128J	102		49-130	4.30	(< 20)
Phenanthrene	2440	125	2682	189	*	126	2909	372	*	49-113	8.30	(< 20)
Pyrene	139J	125	268	102		126	298	126	*	55-117	10.50	(< 20)
2-Methylnaphthalene	28300	125	31932	2870	*	126	36136	6270	*	39-114	12.60	(< 20)
Surrogates												
2-Methylnaphthalene-d10 (surr)		125	148	118	*	126	158	126	*	58-103	6.80	
Fluoranthene-d10 (surr)		125	130	103		126	133	106		54-113	2.80	

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

Billable Matrix Spike Summary

Original Sample ID: 1214864004
MS Sample ID: 1214864005 BMS
MSD Sample ID: 1214864006 BMSD

Analysis Date:
Analysis Date: 08/14/2021 5:37
Analysis Date: 08/14/2021 5:57
Matrix: Soil/Solid (dry weight)

QC for Samples:

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

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

Batch Information

Analytical Batch: XMS12821
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/14/2021 9:39:00PM

Prep Batch: XXX45334
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 8/7/2021 12:59:26PM
Prep Initial Wt./Vol.: 22.71g
Prep Extract Vol: 5.00mL

Analytical Batch: XMS12825
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/14/2021 5:37:00AM

Prep Batch: XXX45334
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 8/7/2021 12:59:26PM
Prep Initial Wt./Vol.: 22.71g
Prep Extract Vol: 5.00mL

Analytical Batch: XMS12831
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: LAW
Analytical Date/Time: 8/16/2021 2:03:00PM

Prep Batch: XXX45334
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 8/7/2021 12:59:26PM
Prep Initial Wt./Vol.: 22.71g
Prep Extract Vol: 5.00mL

Print Date: 08/20/2021 3:30:51PM

SGS North America Inc.

CHAIN OF CUSTODY RECORD

1214864

p#364160 XD

www.us.sgs.com

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

Section 1

CLIENT: Hilcorp WBS# 212-00751.09.05.31

CONTACT: Melissa Mayer PHONE #: 907-350-7952

PROJECT NAME: TS2-15 Trenching PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Melissa Mayer E-MAIL: m.mayer@susitna.com

Nelson Crone Profile #: n.crone@susitna.com

INVOICE TO: QUOTE #:

Hilcorp, Kelley Nixon 907350[illegible] P.O. #: 212-00751.09.05.31

Section 3 — Preservative: 4°C Chill; MeOH

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Comp Grab MI (Multi-incre-mental)	Analysis*: DRO/RRO, PAHs, RCRA Metals	GRO, Petroleum VOCs	RCRA Metals	REMARKS/LOC ID
1AB	2-15-N-01	8/3/2021	745	SO	2	Grab	X	X	X	
2AB	2-15-N-02	8/3/2021	750	SO	2	Grab	X	X	X	
3AB	2-15-S-01	8/3/2021	840	SO	2	Grab	X	X	X	
4-6AE	2-15-FL-01	8/3/2021	905	SO	5	Grab	X	X	X	ms/msd
7A										

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

Section 5

Relinquished By:	Date	Time	Received By:
(1) Nelson Crone — Nelson W. Crone	8/4/21	1230	
(2)			
(3)			
(4)	8/4/21	12:34	Received For Laboratory By:

Section 4 DOD Project? Yes No

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Standard TAT

Temp Blank °C: 3.1 D52

or Ambient [ ]

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Delivery Method: Hand Delivery [ ] Commerical Delivery [ ]

e-Sample Receipt Form

SGS Workorder #: **1214864** | 1214864

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 @ 3.1 °C Therm. ID: D52
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	
	Yes	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes	

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

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1214864001-A	No Preservative Required	OK			
1214864001-B	Methanol field pres. 4 C	OK			
1214864002-A	No Preservative Required	OK			
1214864002-B	Methanol field pres. 4 C	OK			
1214864003-A	No Preservative Required	OK			
1214864003-B	Methanol field pres. 4 C	OK			
1214864004-A	No Preservative Required	OK			
1214864004-B	No Preservative Required	OK			
1214864004-C	Methanol field pres. 4 C	OK			
1214864004-D	Methanol field pres. 4 C	OK			
1214864004-E	Methanol field pres. 4 C	OK			
1214864005-A	No Preservative Required	OK			
1214864005-B	No Preservative Required	OK			
1214864005-C	Methanol field pres. 4 C	OK			
1214864005-D	Methanol field pres. 4 C	OK			
1214864005-E	Methanol field pres. 4 C	OK			
1214864006-A	No Preservative Required	OK			
1214864006-B	No Preservative Required	OK			
1214864006-C	Methanol field pres. 4 C	OK			
1214864006-D	Methanol field pres. 4 C	OK			
1214864006-E	Methanol field pres. 4 C	OK			
1214864007-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
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.